



GUIDELINES

FOR A HEALTHY PASSENGER
EXPERIENCE AT AIRPORTS



Cover / Photo: Josep Tarradellas Barcelona-El Prat Airport (BCN)

PREFACE

by Olivier Jankovec, Director General ACI EUROPE

Two years ago, ACI EUROPE released the second edition of its *Guidelines for Passenger Services at European Airports*¹ - a clear reflection of the evolution of airports from B2B to B2C with passengers now being at the very heart of the airport business.

With these new *Guidelines for a Healthy Passenger Experience at Airports*, we are responding and taking stock of the new reality resulting from the COVID-19 pandemic. This pandemic has in a matter of weeks caused a global crisis of unprecedented proportions. Aviation has found itself amongst the most exposed sectors, with air connectivity having literally collapsed – impacting tourism, supply chains, regional development, jobs and livelihoods.

As airports across Europe became empty, eerie places (with traffic levels back to the levels of the late 1940s), our focus at ACI EUROPE immediately turned to addressing the many challenges involved in restarting operations – chief amongst which is the creation of the conditions necessary for restoring confidence in the health safety of aviation.

Along with other key industry stakeholders including IATA, we have thus worked closely with the European Commission, the European Union Aviation Safety Agency (EASA) and the European Centre for Disease Prevention and Control (ECDC) - contributing to the joint EASA/ECDC COVID-19 Aviation Health Safety Protocol that was published on 20 May 2020.

Europe's airports are extremely grateful to EASA for taking the lead in setting out risk-based, effective and practical guidance at European level on sanitary measures for air travel. There is little doubt that without it, the restart of aviation would have remained elusive.

The purpose of our *Guidelines for a Healthy Passenger Experience at Airports* is to complement this joint EASA and ECDC official Protocol by elaborating on what airports need to consider and do to implement them. They provide practical step-by-step guidance to airports as they restart operations based on a “new normal”, reviewing all possible actions, methodologies, technologies and implications.

In doing so, we have built upon the structure of the *Guidelines for Passenger Services at European Airports*, with its 3Ps methodology (Premises, Processes and People) ensuring a comprehensive and systematic review and adaptation process. This has also involved adding to the passenger categorisation multi-dimensional model by identifying a new category: the Health-Concerned Passenger. While these new Guidelines address the current health crisis, there is no doubt that they will durably influence airports' safety management practices and corporate culture.

1. [ACI EUROPE Guidelines for Passenger Services at European Airports. Second edition](#)

2. [EASA/ECDC COVID-19 Aviation Health Safety Protocol - Operational Guidelines for the management of air passengers and aviation personnel in relation to the COVID-19 pandemic \(version 2.0\)](#).

Together with ACI WORLD and the other ACI Regions, ACI EUROPE remains at the forefront of best practice in airport management. Our objective remains to keep driving further the evolution of the airport business model around the key concept of consumer-centricity and sustainability. At the same time, it is clear that the current crisis requires more than ever fully coordinated and aligned actions amongst the different stakeholders. It is therefore our hope that not only airports but all their operational stakeholders as well as competent authorities will find the *Guidelines for a Healthy Passenger Experience at Airports* a useful tool.

In closing, I would like to thank the many members of ACI EUROPE directly involved in drafting these Guidelines³. A special recognition goes to TH Airport Consulting and One Works for their support and time, and to the Chair of our Facilitation & Customer Services Committee, Mrs. Ira Fernández Lázaro (Düsseldorf Airport).

Brussels, July 2020



3. The following organisations participated in the drafting of these Guidelines: ACI EUROPE (Federico Bonaudi), AENA (Celia Leiro, Gema Martín and Alberto Taha), Aéroports de la Côte d'Azur (Sophie Dalmasso, Sébastien Camelis and Gaëtan Poirier), Groupe ADP (Mathieu Rondel), Aeroporti di Roma (Catherine Ballester and Sergio Berlinghi), Athens International Airport (George Zervoudis), daa (Louise Bannon and John Seely), Düsseldorf Airport (Ira Fernández Lázaro), Fraport (Sascha König and Walter Gaber), Gatwick Airport (Arlette Anderson) Heathrow Airport (Lisa Ward and Sue Hudson), Isavia (Gudmundur Gautason), Manchester Airport Group (Clare James), Munich Airport (Ulrike Reddel), SEA Milano (Delphine Hornez and Riccardo Kusterman), Amsterdam Airport Schiphol (Lotte Harbers), Toscana Airports (Federico Barraco), Dornier Consulting (Tine Haas), One Works (Giulio De Carli), SITA (Lorenzo Belicchi and Carlos Kaduoka), TH Airport Consulting (Torsten Hentschel).

FOREWORD

by Patrick Ky, Executive Director EASA

The outbreak of COVID-19 has had an impact on aviation that goes far beyond every crisis scenario ever envisaged. Previous disruptions pale in comparison. The whole industry is now pulling together to rebuild operations and make the changes needed to restore passenger confidence in air travel in this very challenging environment.

The Guidelines compiled by ACI EUROPE take as their starting point the Aviation Health Safety Protocol published by the European Union Aviation Safety Agency with the epidemiological expertise of the European Centre for Disease Prevention and Control. It offers pragmatic advice for airport operators on the implementation of the Protocol, drawing on real examples and actual situations.

At its heart is the concept of the “health-concerned passenger” – a profile that has been newly defined in response to the current crisis, but which will undoubtedly remain a relevant persona long into the future. The urgency of meeting the needs of this type of passenger has been accelerated by the current pandemic, which has enhanced individuals’ sense of vulnerability. But it has its root in an increased focus on personal well-being and personal responsibility, which was already trending before the COVID-19 outbreak began.

The Guidelines explain how to tailor the airport process to meet passenger needs. This means not only putting in place the measures to minimise the spread of COVID-19 as recommended in the EASA/ECDC Protocol, but also being aware of the perceptions and emotional responses these precautions can awaken in such passengers. Additional explanation and communication can create a greater sense of reassurance and comfort.

The approach gives the Guidelines a value and perspective beyond the immediacy of the current crisis. The document considers technological enhancements and innovations that will help reassure this type of passenger longer-term. This includes increased digitalisation and use of artificial intelligence to help smooth the passenger journey.

To reach that future, the industry has to find its way through the very immediate current difficulties.

I wish all users of this guide every success in finding a successful implementation in your individual terminals. It is essential that every facility plays its part in creating a harmonised process that ensures that passengers feel safe and are safe. If you need further help or advice, please reach out to the experts of EASA or ACI EUROPE for further assistance. We are all in this together and should help each other wherever possible.



Beyond the operational challenges imposed by the COVID-19 pandemic, the passenger experience will see a profound shift in the way people use and enjoy airport facilities and services. A wide range of sustainable and phased improvement plans will be required for facilities and services, where Guidelines such as this, together with the ongoing lessons learned, will play a key role in driving planning and actions. Airports now need to take this opportunity to boost innovation and upgrade their facilities and services. New technologies will play a key role in creating future operations that are not only economically sustainable, but also environmentally sustainable.

Moving forward, a deeper collaboration between airport operators and industry stakeholders will be crucial in designing operations that meet the even more complex needs of passengers and carriers, whilst airports continuously strive to create a positive passenger experience. Only working together will we provide a successful healthy safe environment, fully restore confidence in air travel and ensure the industry does not shut-down again.

Giulio De Carli
Managing Partner

ONEWORKS:

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London City Airport / LCY



Dublin Airport / DUB

INTRODUCTION

How to use these Guidelines

The *Guidelines for a Healthy Passenger Experience at Airports* are aimed at providing detailed guidance to Airport Managing Bodies, supporting air travel in the post COVID-19 environment with a focus on guaranteeing the health and safety of both passengers and staff.

In order to achieve this objective, the Guidelines provide the tools to:

- **Identify a new passenger category: the health-concerned passenger.**
- **Ensure that airport premises constitute a safe environment.**
- **Redefine the airport processes to comply with new health requirements while respecting operational needs and using innovative solutions.**
- **Protect the people (staff).**

Each chapter may be approached independently, but the Guidelines follow a progressive path and all-encompassing approach taking into account the joint recommendations of the EASA (European Union Aviation Safety Agency) and the ECDC (European Centre for Disease Prevention and Control) - for example concerning the measures to implement when physical distancing cannot be guaranteed.

Graphically, the Guidelines use 3 colour schemes to identify specific elements as shown below: Goals for a healthy passenger experience in grey boxes, EASA/ECDC recommendations in light blue boxes and ACI EUROPE recommendations in dark blue boxes:

	PICTURES
	TABLES
	GOALS FOR A HEALTHY PASSENGER EXPERIENCE
	EASA/ECDC RECOMMENDATIONS
	ACI EUROPE RECOMMENDATIONS

Need for a Healthy Passenger Experience

The COVID-19 pandemic resulted in an unprecedented global crisis for many industries and for the entire air transport sector, in particular. This crisis has shown that – to different degrees – our societies were insufficiently prepared. However, the recurrence of health crises over the last 20 years sent repeated warnings about the likelihood of a major pandemic such as South Asian Respiratory Syndrome (2002), mumps and Swine flu (2009), Middle East Respiratory syndrome (2012), Ebola (2012), and Zika virus (2015).

Epidemiology in general and disease surveillance in particular offer useful analytical tools and methods for identifying and measuring trans-border patterns of infectious diseases which can be “facilitated” by globalisation, ever increasing personal mobility and air connectivity.

It is well recognised that passenger and cargo traffic facilitate the movements of pathogens across the world and, since most infectious diseases have incubation periods exceeding 36 hours and any part of the world can be reached within this timeframe, the potential for rapid geographical spread is apparent.

Although air transport cannot be considered the cause of the latest pandemic episodes (causes often involve a mix of economic, environmental, demographic, and cultural factors), the focus has been put on air transport as a possible vector for or facilitator of transmission. The demand and expectations to fly safely, securely and on-time more than ever impact the way Airport Managing Bodies interact with their passengers, staff, and other stakeholders.

Some people might remain fearful of travelling due to health concerns once confinement and travel restrictions are fully lifted. The aviation sector needs to win back public confidence and demonstrate that flying is safe again and that infection risks are greatly and effectively minimised. New measures and adapted processes at airports are required at every step of the passenger journey – with significant impact on airport operations.

Many measures implemented as part of the restart and recovery phases are bound to be temporary; however, several initiatives and changes to create a healthy passenger experience are likely to become permanent or lead to further change and evolution over time.

As stated by EASA/ECDC⁴: *“preventive measures are expected to be gradually reduced over time in line with a reduction of the risk level. Furthermore, as additional reliable mitigating measures become available, these should be considered as alternatives in order to alleviate the burden on passengers and staff, whilst maintaining the appropriate level of health safety in accordance with the level of risk.”*

To ensure a healthy passenger experience measures should be scientifically supported, effective and implemented in a way to minimise disruption. Implemented measures need to be constantly reviewed and adapted or replaced if more effective or efficient solutions become available.

4. EASA/ECDC COVID-19 Aviation Health Safety Protocol - Operational Guidelines for the management of air passengers and aviation personnel in relation to the COVID-19 pandemic (version 2.0).

Methodology from the ACI EUROPE Guidelines for Passenger Services at European Airports

A safe and quality Passenger Experience will be a key success factor for Airport Managing Bodies to win back cautious and anxious travellers during and after the COVID-19 crisis. Satisfied and reassured passengers are likely to:

- Recommend the airport to others and share their positive experience via social media.
- Become loyal and likely to come back.
- Spend more time and money at the airport when it becomes possible again (every +1% increase in passenger satisfaction yields a +1.5% increase in non-aeronautical revenues)⁵.

The ACI EUROPE *Guidelines for Passenger Services at European Airports* provide a methodology to enhance the passenger experience in a systematic and comprehensive way. This recognised methodology can also be used and further developed to create a healthy passenger experience. It comprises the following main elements as also shown in the figure below:

- Passenger identification and segmentation
- Analysis of passengers' needs and expectations
- 3P approach (Premises, Processes, People)



PICTURE 1 – METHODOLOGY TO ENHANCE THE PASSENGER EXPERIENCE



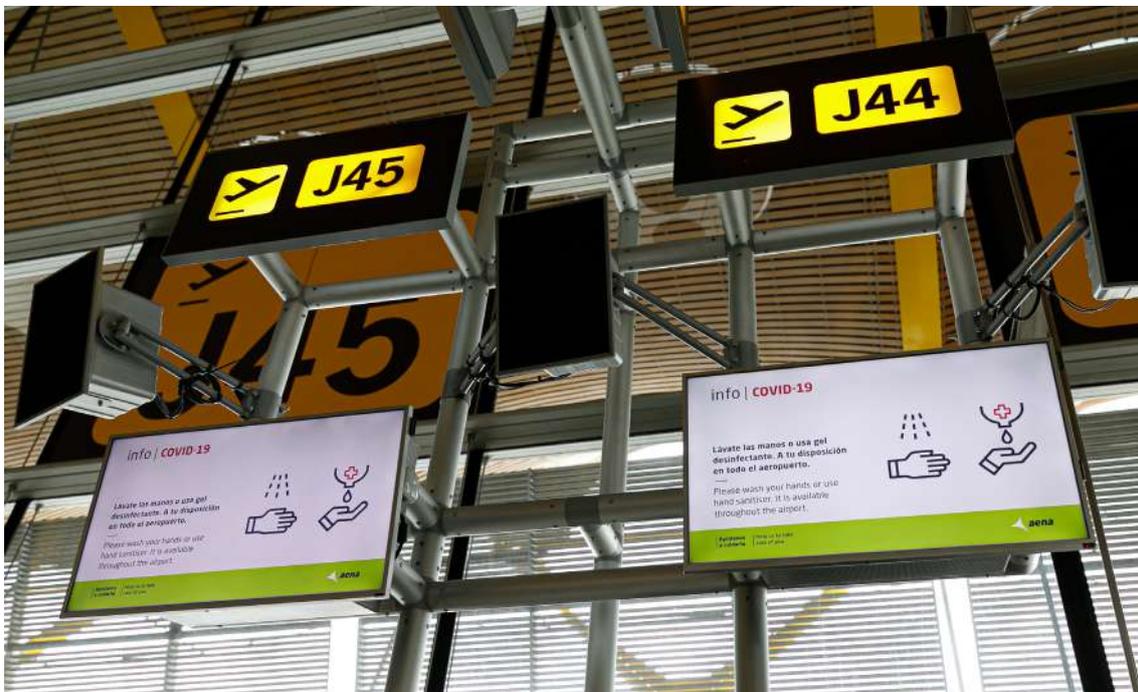
5. Does passenger satisfaction increase airport non-aeronautical revenue? A comprehensive assessment research report. ACI World.

In a first step the relevant passenger categories at an airport need to be identified. With the COVID-19 crisis, previously unconsidered passenger categories with specific needs and expectations become relevant for airports. A new category - the 'health-concerned passenger' - which includes passengers who are particularly vulnerable to diseases or are anxious to travel during health crises, has appeared and will be further described in the following chapter.

The needs and expectations of health-concerned passengers have to be carefully assessed before defining the most suitable initiatives and adaptations required for a healthy passenger experience. For that purpose, a passenger perception pyramid is proposed in the following chapter of these Guidelines.

To create a healthy passenger experience a range of ad hoc measures needs to be considered and implemented for the premises, processes, and people of an airport, as per the so called 3P approach. These Guidelines provide an overview of the different initiatives and changes required to deliver a healthy passenger experience. Each of the 3Ps has a dedicated chapter in these Guidelines covering:

- **Premises:** maintain their original functionality (e.g. cleanliness, attractiveness, sense of place all while being easy to navigate) and accommodate new health safety requirements such as physical distancing.
- **Processes:** maintain operational efficiency and re-organise the touchpoints of the passenger journey in response to the pandemic.
- **People:** maintain the highest level of service and reassure the community (i.e. staff and all people at the airport) that the premises and processes will ensure their health and safety.



Madrid-Barajas Adolfo Suárez Airport / MAD



THE PASSENGER



In this chapter a new category of passenger, the health-concerned passenger, will be defined with its specific needs and expectations. The main goals for a healthy passenger experience will be outlined.

1.1. A NEW PASSENGER CATEGORISATION: THE HEALTH-CONCERNED PASSENGER

As airports put in place a series of measures to guarantee the health and safety of the travelling public and their staff, they also need to take into account **new patterns in passenger behaviour** that are likely to persist once the current pandemic comes to an end: **the health-concerned passenger**.

This consumer concern has already been underlined by several studies. International market research⁶ with a representative sample in 18 countries has revealed three main behaviours, with consumers being:

- More health conscious (56% of people surveyed).
- More committed to saving money for 'a rainy day' (44% of people surveyed).
- More environmentally conscious (38% of people surveyed).

Another study⁷ has showed that having a "health strategy" will be a strategic differentiator for companies in the future, since 64% of respondents are reported to be fearful for their own health and 82% fearful for the health of others.

The airport environment is unique because it facilitates the interaction of so many individuals from diverse cultures and places. These passengers are adopting new behaviours aimed at limiting the risk of transmission during their journey. Airport Managing Bodies need to keep in mind that passengers have to be protected and at the same time reassured and informed about the measures put in place. As a result, passengers will need to be simultaneously informed, empowered and (health) protected.

Because airports play a critical role in helping people to realise their ambitions/goals and fulfil their desires/aspirations, the environment facilitates many passengers from diverse cultures and demographics mingling and interacting. These passengers will have their own individual perceptions and possibly experience as regards COVID-19, shaped by the epidemiological situation, Governmental and public response, and communications in their own place of residence. This means that perceptions and experiences of COVID-19 are not uniform but vary significantly depending on each passenger's individual environment and circumstances. Airports need to be mindful of this when building recovery plans to reassure passengers and create confidence in the health safety of air travel.

6. *Global barometer Consumer Reactions to Covid-19 first wave Toluna-Harris Interacrive-Kurundata sample:13.949 in Europe (France, Germany, Italy, Spain and UK), Asia (Australia, Singapore, Malaysia, Indonesia, Philippines, Thailand, Japan, Korea, China, Hong Kong, India) and America (USA and Brazil).*

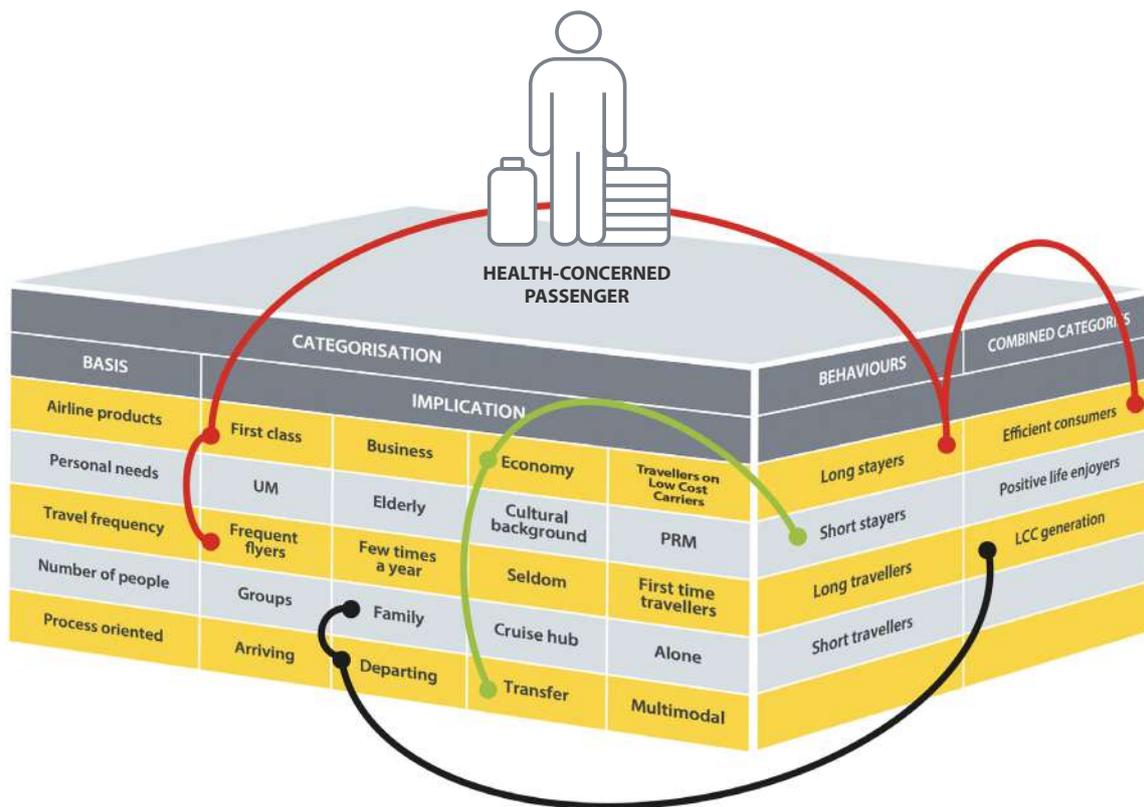
7. *COVID-19 will permanently change consumer behavior. Accenture, 28 April 2020.*

The passenger categorisation is based primarily on attitudes and values, not just behaviour at the airport. This new passenger category, the health-concerned passenger will:

- Pay special attention to the measures aimed at limiting the risk of transmission (for instance, 90% increase in the frequency of hand washing⁸).
- Increase their consumption consciousness at airports (cost, sustainability, reduced human contact).
- Continue embracing technology and considering digital and no/low-touch solutions.
- Expect Airport Managing Bodies to:
 - respond to their needs and expectations.
 - redefine their relations with them and the other stakeholders.
 - innovate to provide solutions.



PICTURE 2 – PASSENGER CATEGORISATION: THE MULTIDIMENSIONAL MODEL INCLUDING THE HEALTH-CONCERNED PASSENGER



8. Accenture COVID-19 Consuler Pulse. 19-25 March 2020.

As market research has necessarily halted in many airports during the pandemic, it is not possible to know, in this initial recovery phase, the specific needs and expectations of passengers. Therefore, it is highly recommended to proceed as soon as possible with surveys to determine with more accuracy what might prevent passengers from travelling again. This will be key to better identify and understand the various categories of passengers as behaviours, motivations, desires, and issues to address change in the wake of the COVID-19 crisis. The conception, planning and delivery of services and of the whole airport experience needs to be aligned with the needs and expectations of the health-concerned passenger.

Finally, customer experience is made of both tangible assets and emotional factors: it is likely that feelings, in this particular moment, will prevail.



ACI EUROPE RECOMMENDATIONS

Airport Managing Bodies aiming to enhance the passenger experience need to:

- Conduct surveys to determine and analyse the needs and expectations of passengers in the wake of the COVID-19 crisis.
- Launch communication campaigns to reassure passengers that their health will not be at risk and that all measures have been taken for their safety – in particular as regards transmission risks.
- Increase the use of all communication channels and especially social media to provide the needed information to passengers to prepare their journey (e.g. required documentation, new processes, implemented measures, requirements at destination).
- Check that they fully integrate the health safety dimension into their own corporate culture and strategy.
- Actively promote collaboration between stakeholders that play a key role in the passenger experience (i.e. ground handlers, air carriers, CAAs, sub-contractors, etc.) to deliver a clear and tailored message.

1.2. A NEW PYRAMID OF PASSENGER PERCEPTION LEVELS

Once the Airport Managing Body has identified the categories of passengers likely to use its premises and has analysed their specific needs and expectations (taking into account the health-concerned passengers), the next step is to determine what initiatives and changes should be implemented to provide a healthy passenger experience. In order to achieve this, the concept of passenger perception levels is an extremely useful tool since it encompasses the passengers' feelings. In particular, the level of stress as well as emotions, be they positive or negative, are likely to influence dramatically the perception of initiatives and changes at each step of the passenger journey.

As reported in the *ACI EUROPE Guidelines for Passenger Services at European Airports*, three levels of passenger perceptions have been identified which are brought together in a pyramid: required, expected, and valued. The passenger perception pyramid considers the emotional factors as well as the needs and expectations of specific passenger segments. It also supports airports when assessing the various initiatives and changes needed to create a healthy passenger experience.

Required

The required level of the pyramid constitutes the minimum which has to be in place for a healthy passenger experience. If those basics cannot be delivered at airports the passenger journey could be considered as unsafe and health-concerned passengers will have an unpleasant experience which they might also share on social media. Airports are highly advised to systematically fulfil these basic requirements since otherwise passengers might not return and will not regain confidence in air travel. The required level of the pyramid includes for example:

- Key operational passenger processes (e.g. check-in, security, passport control, boarding) are performed in ways to minimise transmission risks and positively impact the perception of such risks for the health and safety of the passenger.
- Health regulatory requirements are fully and consistently met - such as employees wearing face masks or other personal protective equipment when required, physical distancing being facilitated and respected throughout the entire airport.
- Premises are regularly cleaned and disinfected.

Expected

The expected level of the pyramid constitutes the fulfilment of the needs and expectations of most passengers which go beyond the minimum requirements. These expectations are usually specific to the particular passenger segments at an airport which can depend on their cultural background or local specifics. The expected level of the pyramid includes for example:

- Essential services to be available all over the airport, including new retail and F&B offerings (e.g. more prevention drugs, personal care products, take-away and delivery options).
- Use of contactless processes at the touchpoints as much as possible.
- Reassurance from staff due to an elevated level of anxiety and stress.
- Clear and consistent information on measures implemented.

Valued

The valued level of the pyramid constitutes initiatives that exceed the expectations of most passengers at a particular airport. Experiences which exceed expectations are more likely to be shared on social media and contribute to a positive image for an airport. “Wow” factors encourage passengers to return and further help to regain confidence in air travel. The valued level of the pyramid constitutes for example:

- New technologies for a contactless end-to-end passenger journey including all touchpoints.
- Surprise and delight concepts to interact with passengers in a more emotional and personal way, reaching their heart and provoking positive emotions.
- Kind attention or gestures from staff that make passengers feel welcome, which will be remembered, create positive emotions and fond memories.

These three levels may be applied to health and sanitary measures as per the following pyramid:



PICTURE 3 – PYRAMID OF PASSENGER PERCEPTION LEVELS: HEALTH AND SANITARY MEASURES



1.3. GOALS FOR A HEALTHY PASSENGER EXPERIENCE

Before recommending initiatives and changes to deliver a healthy passenger experience, the goals to be achieved need to be carefully defined – specifically having in mind the health-concerned passenger.



GOALS FOR A HEALTHY PASSENGER EXPERIENCE

- Prevention of COVID-19 infections through airborne transmission or surface contact.
- Provision of confidence to passengers that the journey through the airport, with its various touchpoints, is safe.
- Compliance with recommendations and regulations from the competent authorities and relevant institutions.
- Satisfaction of the needs and expectations of health-concerned passengers.
- Comprehensive achievement of a healthy passenger experience by equally addressing the 3Ps (Premises, Processes, People) for the end-to-end passenger journey.



ACI EUROPE RECOMMENDATIONS

Carefully and comprehensively define the goals for a healthy passenger experience considering the specific needs and expectations of your passengers as well as the specific characteristics of the passenger terminal buildings and related facilities.



Zagreb Airport / ZAG



London City Airport / LCY



PREMISES



For the purpose of these Guidelines, premises are considered as the terminal and other passenger-related facilities that are under the control of the Airport Managing Body (for instance parking and in some cases, multi-modal platforms like metro or train stations).



GOALS FOR A HEALTHY PASSENGER EXPERIENCE – Premises

Ensure a healthy passenger experience by...

- Achieving physical distancing between people within the airport premises (Chapter 2.1).
- Ensuring an optimal hygiene level through enhanced cleaning and disinfection (Chapter 2.2).
- Improving terminal heating, ventilation, and air conditioning (HVAC) (Chapter 2.3).
- Encouraging the use of face masks within the airport premises (Chapter 2.4).
- Implementing protective screens at touchpoints between passengers and staff (Chapter 2.5).

2.1. PHYSICAL DISTANCING

Within a timespan of only a few months, COVID-19 spread globally. Research shows that transmission may occur by means of saliva, often in the form of micro-droplets. When a person sneezes, coughs or even exhales, they emit small droplets – often too small to see with the naked eye – that can carry the virus. The receiving persons can be infected by inhaling these droplets, or by getting these droplets on their hands and then touching their face.⁹

During the current pandemic, European States (and more generally Governments across the Globe) have imposed a “physical distance” to be kept between individuals. This is considered an important and effective prevention measure, because it is expected that most of the droplets fall and reach the floor and/or evaporate before having travelled a distance of 1.5m (it is acknowledged, however, that there is no consensus on the ideal physical distance to minimise transmission).

9. WHO, *Transmission of SARS-CoV-2: implications for infection prevention precautions*, July 2020.



GOALS FOR A HEALTHY PASSENGER EXPERIENCE – Physical Distancing

Physical distancing needs to be achieved throughout the passenger journey...

- In queues.
- In circulation (passenger flows) and waiting areas.
- In contained spaces and rooms such as shops/restaurants, lounges, restrooms, buses, automated people movers, escalators, elevators and travellers, etc.
- During any interaction between passengers and staff.

Usage of available floor surfaces (markings) needs to be maximised to facilitate the implementation of physical distancing while maintaining operational efficiency.



EASA/ECDC RECOMMENDATIONS¹⁰

- Passengers should be reminded that the 1.5 metre physical distance between individuals should be maintained as much as possible at the airport.
- If it cannot be guaranteed because of operational constraints, the airport operator should implement risk-mitigating measures.



Brussels Airport / BRU

10. EASA/ECDC COVID-19 Aviation Health Safety Protocol - Operational Guidelines for the management of air passengers and aviation personnel in relation to the COVID-19 pandemic (version 2.0).

2.1.1 IMPLEMENTING PHYSICAL DISTANCING (GENERAL)

In this chapter the recommended general initiatives to achieve physical distancing are listed for:

- Areas inside the terminal
- Areas outside the terminal (landside and airside)
- Limitations of access to terminals
- Monitoring physical distancing



EASA/ECDC RECOMMENDATIONS¹¹

- Airport operators, in cooperation with aircraft operators and other aviation stakeholders, where applicable, are encouraged to take appropriate measures to prevent queues in high passenger concentration areas as much as practicable, in order to reduce the risk of infection posed by unnecessary human interaction. For queuing, floor markings at least 1.5 metres apart can assist passengers in maintaining physical distancing.
- Aircraft operators and airport operators should cooperate to ensure that physical distancing is observed, wherever feasible, especially during check-in, security checks, pre-boarding, and boarding. When the recommended physical distance is not possible (at least 1.5 metres) due to infrastructure or operational constraints, the aircraft operators and airport operators should implement and encourage adherence to additional risk-mitigating measures such as hand hygiene, respiratory etiquette, use of face masks, enhanced boarding procedures, additional buses for boarding, etc. Airport operators, as far as practicable, should also put in place separate opposite flows. This could be achieved through floor markings, stanchions, or direction signs. As regards access to the airport toilets, the principles of physical distancing should be considered and respected.

11. EASA/ECDC COVID-19 Aviation Health Safety Protocol - Operational Guidelines for the management of air passengers and aviation personnel in relation to the COVID-19 pandemic (version 2.0).



ACI EUROPE RECOMMENDATIONS – Areas inside the Terminal

Circulation, flows:

- Rearrange passenger flows with signage of one-way paths where possible to avoid cross-flows and crowded areas.
- Actively manage flows using passenger flow management tools and/or staff.

Queuing (check-in, security, border control, boarding, etc.):

- Floor marks every 1.5m to allow flexibility according to local queuing set-up.
- Protective panels to separate adjacent queuing lanes.
- Open/close certain desks/counters, kiosks, or security lanes to ensure space between passengers; to be closely monitored and adapted to ensure that sufficient facilities are opened to prevent queues arising.
- If operationally and financially possible, increase the number of open counters/lines.
- If operationally and financially possible, only open every other adjacent boarding gate.
- If operationally and financially possible, organise boarding by small groups (e.g. calling passengers by seating rows).
- If operationally and financially possible, cancel pre-boarding.
- Brief Welcome Agents to direct passengers to queues with less passengers and/or self-service equipment (e.g. self-check-in kiosks, self-bag-drop, etc.).
- Communications: additional dedicated information at each queuing entry.

Baggage reclaim rooms:

- Floor marks ideally offset of 2-3m from the carousel to maintain physical distancing.
- When possible, utilisation of every second carousel only and only 1 flight per carousel at a time.
- Communication: additional dedicated information at each baggage reclaim room entry.

Lifts:

- Re-define maximum capacity per lift to respect physical distancing.
- Organise queuing in front of the lift with floor marks.
- Entry/Exit flows: communicate clearly that people need to leave the lift before others enter.
- Communication: additional dedicated information in or outside each lift.

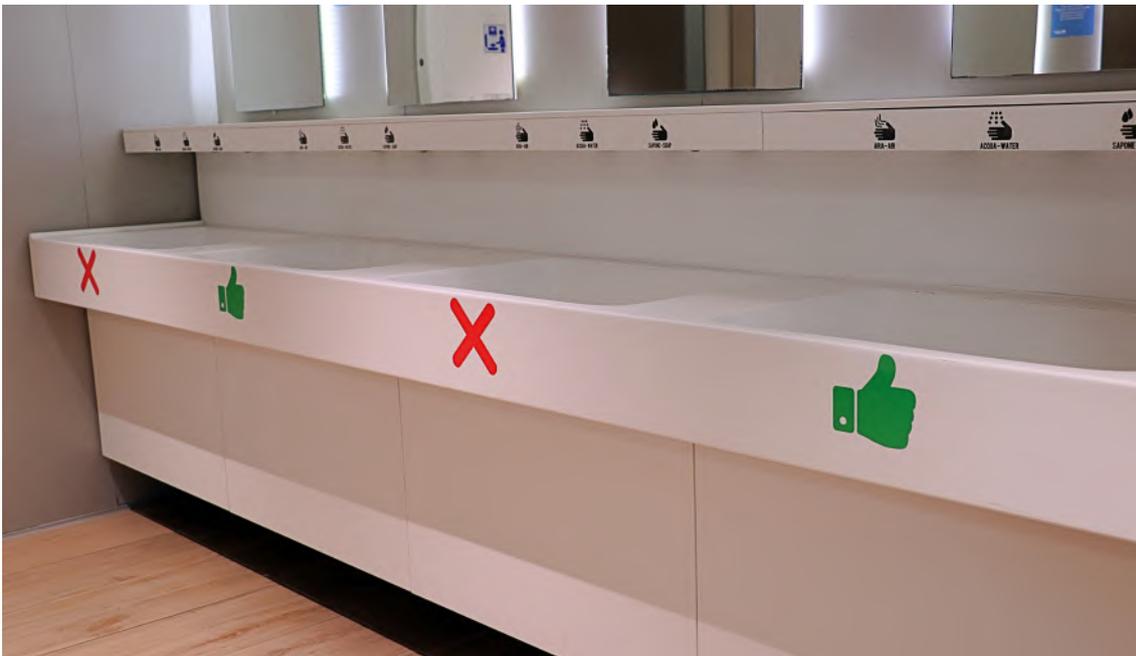


Passenger services:

- Services should be actively managed to avoid over-crowding.
- Restrooms: Re-define maximum capacity and control number of persons inside; manage queuing with floor marks; close every other washbasin and urinal if suitable.
- Lounges: Re-define maximum capacity and control number of persons inside; remove seats and tables inside and avoid crossflows if possible.
- Smoking room: closed when possible - if not, re-define maximum capacity and manage queuing with floor marks.
- Prayer rooms: re-define maximum capacity and manage queuing with floor marks.
- Business centres: re-define maximum capacity and manage queuing with floor marks.
- Play areas: closed when possible.
- Service desks (e.g. ticket sales counters, lost & found, information counters) will have to be requested to comply with physical distancing measures applicable in terminal areas. As such, the use of belt barriers and floor marks will be required, having in mind that they should not impede passenger flows and result in bottlenecks (always maintain a circulation corridor).

Seating (waiting areas, boarding room, departure gates, lounges, etc.):

- For recommendations on terminal seating refer to chapter 2.1.2.



Rome–Fiumicino International Airport / FCO



EASA/ECDC RECOMMENDATIONS¹²

- When buses are used for the boarding/disembarkation process, an increased number of buses should be considered in order to accommodate passenger physical distancing inside them.



ACI EUROPE RECOMMENDATIONS – Areas outside the terminal (landside and airside)

Bus and Automated People Mover (APM) (landside and airside):

- Redefine maximum capacity of each vehicle to allow spacing (e.g. 2-3m²/passenger inside vehicles) and floor marks inside to separate passengers (if possible).
- Need to take into account operational consequences in terms of additional passenger processing/flow time and/or bus numbers required to board/deboard.
- Limit and control number of passengers on APM platforms and bus waiting areas.
- Separate passenger flows for boarding and deboarding the vehicle.

Taxi, parking pay stations and other waiting lines:

- Manage distance with floor marks.

12. EASA/ECDC COVID-19 Aviation Health Safety Protocol - Operational Guidelines for the management of air passengers and aviation personnel in relation to the COVID-19 pandemic (version 2.0).



EASA/ECDC RECOMMENDATIONS¹⁵ – Limitations of access to terminals

- Access to airport terminals should be limited to passengers, crew members and staff (airport and aircraft operators as well as other service providers/suppliers that are required to enter the terminal to perform their tasks) to the extent possible. Accompanying persons should access airport terminals only in special circumstances (e.g. when accompanying or picking up a passenger that requires assistance, such as persons with reduced mobility (PRM), unaccompanied minors, etc.).
- When meet-and-greet cannot be avoided (e.g. for persons requiring assistance), a meet-and-greet area should be set up away from the exits from the restricted area and away from the main passenger flow to reduce the risk of the arriving passengers crossing paths with other individuals.



ACI EUROPE RECOMMENDATIONS – Limitations of access to terminals

Farewellers, greeters and visitors:

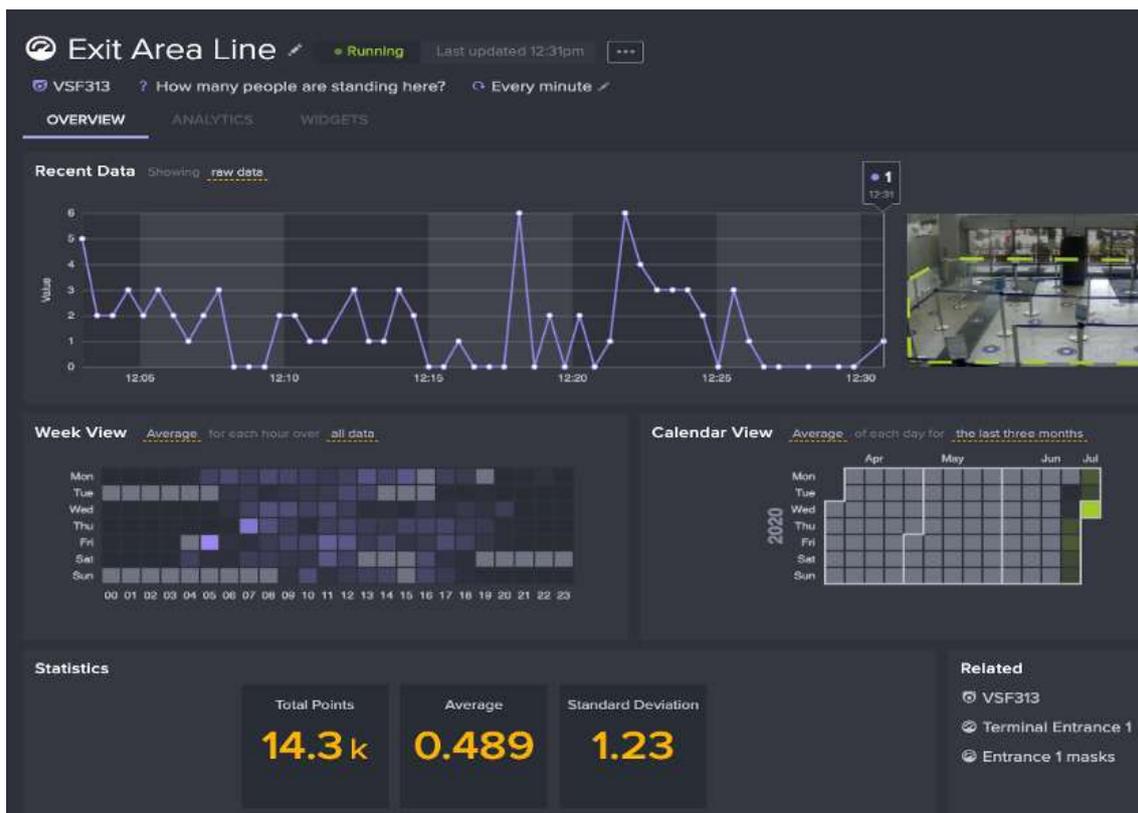
- According to each airport's specificities and the applicable national regulation, restrict access of farewellers, greeters and visitors into the terminal building as long as this does not create crowds and queues, which could then increase transmission risks as well as create potential security vulnerabilities.
- Accompanying persons for PRMs, elderly travellers or unaccompanied minors should still be permitted to access the terminal.
- Organise meeting points in parking areas and curbside for passenger pick-up and guide arriving passengers to these locations (also suggest greeters to send SMS to the passengers).
- Communicate the restrictive measures in parking facilities, airport metro/train stations and terminal areas as well as on all airport communication channels.

15. EASA/ECDC COVID-19 Aviation Health Safety Protocol - Operational Guidelines for the management of air passengers and aviation personnel in relation to the COVID-19 pandemic (version 2.0).



ACI EUROPE RECOMMENDATIONS – Monitoring¹⁶

- It is recommended that Airport Managing Bodies monitor the effectiveness of physical distancing measures and whether passengers comply with them; staff should be empowered to remind passengers of the applicable rules.
- Enforcement responsibilities depend on the airport role in the different processes (vs. airlines, handlers, F&B operators, etc.).
- Monitoring tools may include visual checks by airport, airline, and ground handling staff, and/or use of monitoring tools (e.g. flow monitoring tools), video-monitoring, video-analysis, technologies for counting passengers in spaces/areas etc.) and passengers dynamic simulations (See Chapter 2.4.10).



Naples International Airport / NAP (this photo is a proof of concept being tested by NAP)

16. Please note that enforcement of physical distancing cannot be guaranteed at all times. Monitoring and informing passengers appears to be the best approach.

2.1.2 TERMINAL SEATING

Standard terminal seating provides space of much less than 1.5m between adjacent seats. The recommended physical distance of 1.5m cannot therefore be guaranteed in existing seating areas. Comfortable seating is nonetheless a basic requirement for passenger satisfaction at an airport.



ACI EUROPE RECOMMENDATIONS

In order to guarantee the required physical distancing of 1.5m, Airport Managing Bodies may consider:

- Reducing the overall number of seats offered.
- Rearrangement of seating locations/spaces with the use of previously empty spaces.
- Normal single chairs can be easily removed and stored somewhere away from passenger areas. However, seating benches cannot be removed totally and neither single seats within each bench, as this would affect the stability of benches and potentially dangerous tripping points could emerge. In such case individual seating needs to be blocked (alternate).
- Blocked seats need to be clearly signalled with solutions/means that cannot easily be removed by passengers or cleaning staff. The durability and sustainability of everyday use need to be considered. Crosses with adhesive tapes on the seat base should be avoided due to potential seat damage.
- Possibilities for couples or families to sit together should be considered in accordance with local rules.
- A sufficient number of the remaining seats should be reserved for PRM, elderly people, pregnant women, and other passengers in need of a seat.

2.1.3 WAYFINDING AND SIGNAGE

In order to comply with the recommendation to ensure – as much as possible - a minimum physical distance of 1.5m within the terminal, it is essential to display additional signage and information for passengers, visitors and staff using:

- Digital screens, monitor displays and static displays.
- Floor markings.
- Vertical signage.
- Specific announcements via electronic speakers.
- Digital wayfinding information to avoid crowded areas.



ACI EUROPE RECOMMENDATIONS

Digital Screens, Monitor Displays and Static Displays:

- The easiest way to inform passengers is to use existing static displays and monitors so as to provide information on each touchpoint.
- Information should be standardised in format and content, with simple messages and pictograms.
- Use positive messages with high-visibility colours.
- Avoid negative images and prohibitions.



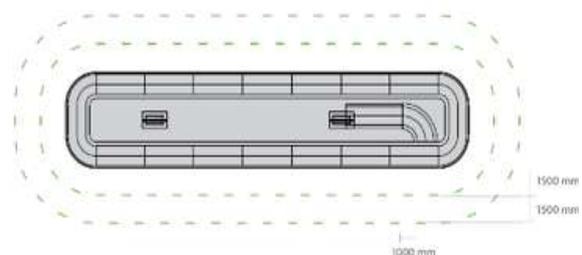
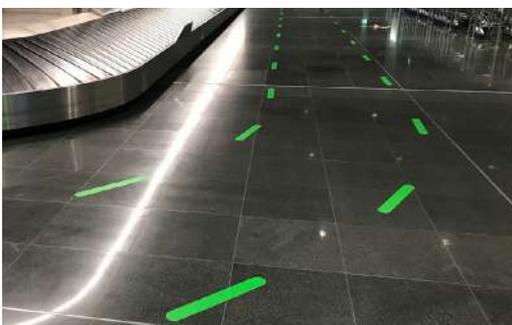
ACI EUROPE RECOMMENDATIONS

Floor Markings:

Touchpoints like check-in, boarding pass control, security and border control, and boarding gates may present operational constraints making it difficult to ensure 1.5m physical distancing at all time. When it comes to queuing situations, special floor markings are useful to ensure distances between passengers.



PICTURE 4 – EXAMPLE FLOOR-MARKINGS FOR BAGGAGE CLAIM CAROUSEL FRANKFURT AIRPORT





Munich Airport / MUC & Dublin Airport / DUB



ACI EUROPE RECOMMENDATIONS

Specific Announcements via Electronic Speakers:

- Use automated announcements via electronic speakers to provide information and remind passengers of the requirement to maintain a 1.5m physical distance. Announcements should be made at different touchpoints and at regular intervals throughout operational hours.
- The use of additional languages besides the local official language(s) is also recommended.



ACI EUROPE RECOMMENDATIONS

Digital wayfinding information to avoid crowded areas:

- Use of indoor guidance and geolocation services incorporated in airport apps in order to inform passengers and visitors and monitor passenger flows.
- This solution can detect where the most crowded areas are both at airport facilities access areas and inside terminals - and can thus contribute to the distribution of passengers, informing and guiding them to routes or to areas where there is less influx and preventing crowds.
- It also can provide passengers with a mapping of the location of disinfection points, storage of protection material points and toilets.

2.1.4 INFORMATION ON PHYSICAL DISTANCING ALONG THE PASSENGER JOURNEY

This section outlines additional guidance on which kind of information should be provided along the passenger journey to emphasise physical distancing and other preventive measures.



EASA/ECDC RECOMMENDATIONS¹⁷ – Passenger Information

- Passengers should be regularly instructed via audio-visual messages, as well as other appropriate means, to adhere to the preventive measures in place at various areas in the airport and in the aircraft and give proper consideration to the full suite of preventive measures. They should also be advised of the consequences of not adhering to such measures.
- Health safety promotion material should be widely available at airport premises (entrances, information screens, gates, lounges, etc.). Attention should be paid to the format of the health safety promotion material: pictograms are strongly recommended. This material should be available in the national language(s), in English and, where necessary, in other languages based on the most common language profiles of the passengers using the airport.



Heathrow Airport / LHR

17. EASA/ECDC COVID-19 Aviation Health Safety Protocol - Operational Guidelines for the management of air passengers and aviation personnel in relation to the COVID-19 pandemic (version 2.0).



ACI EUROPE RECOMMENDATIONS – Information Pre-flight

- Passenger information on “physical distancing” and other applicable measures at airports should commence from the delivery to passengers of their flight itinerary upon booking with a dual aim:
 - Passengers are adequately informed well in advance on what to expect in terms of travel processes and behaviour while entering and using airport premises.
 - Air carriers are aware of applicable measures at airports, so that useful information provided to their passengers on their journey while in the terminal areas is modified accordingly.
- Airport websites should be updated to reflect “physical distancing” and other applicable measures, with the information provided in the most popular sections.
- The same information should be “pushed” from direct communication with the public through social media.
- Information delivered by the Airport Call Centre.



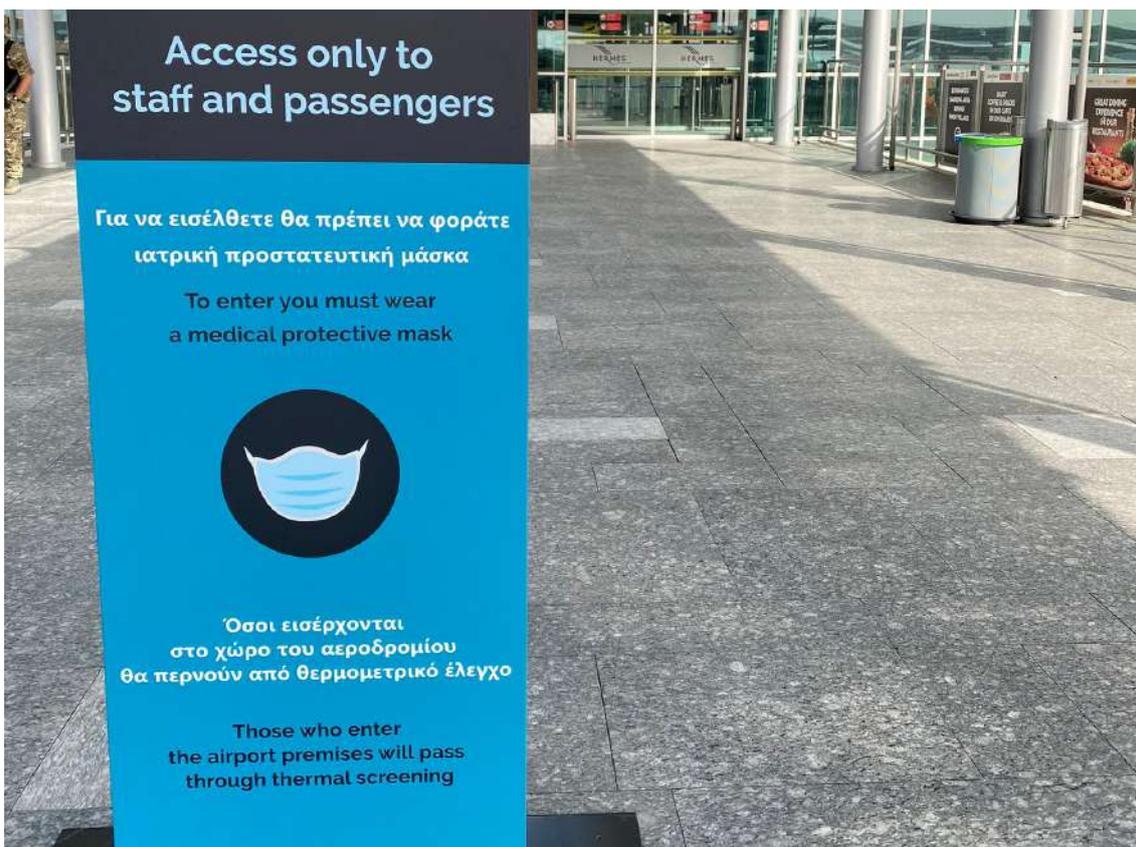
ACI EUROPE RECOMMENDATIONS – Information at Access and Parking

- Ground Transportation: Liaise with public authorities and transport companies.
- Physical distancing applicable measures should be displayed on Public Transportation monitors.
- Relevant announcement may be broadcast in the bus/metro coach, en-route to the airport.
- Specifically for those entering Airport Parking facilities, measures should also be displayed.



EASA/ECDC RECOMMENDATIONS¹⁸ – Limitations of access to terminals

- In order to reduce the number of people in the terminals, and consequently facilitate physical distancing, airport operators, in coordination with aircraft operators, should inform passengers prior to their arrival at the airport that access to terminals is restricted to passengers only, with the exceptions of those presented in Section 2 'General considerations'. Furthermore, airport operators should clearly signal the points beyond which any accompanying persons are not allowed to go.
- Airport operators should inform meet-and-greet individuals that access to the terminal is limited to passengers, aircrew members and airport staff only.



Hermes Airports

18. EASA/ECDC COVID-19 Aviation Health Safety Protocol - Operational Guidelines for the management of air passengers and aviation personnel in relation to the COVID-19 pandemic (version 2.0).



Düsseldorf Airport / DUS



ACI EUROPE RECOMMENDATIONS – Information at Departure

As outlined in chapter 2.3, the use of monitors, signs, floor markings, wall-mounted posters and public announcements at each touchpoint are amongst the recommended tools.

Curbside:

- Clear signage, floor markings and temporary infrastructure should be displayed to clearly define buffer areas, should overcrowding occur in the departure hall.
- Airport staff may be required to direct passengers to enter the appropriate terminal entrance based on airline check-in allocation, in order to avoid crossflows and congestion in check-in halls.
- Specific information for greeters or visitors.
- Information displays (static or digital screens).

Check-in:

- All applicable physical distancing and any specific health protection processes should, again, be clearly visible to passengers in check-in halls, regardless of the type of check-in method used (check-in counter booths, common use self-service (CUSS) kiosks, Web check-in kiosks).
- Airport and air carrier staff may be required to verbally inform passengers on physical distancing and health protection measures.
- Physical distancing signage and floor markings will be subject to the belt barrier formation (snake formation vs straight lines).

Security and Passport Control, Customs:

- Information displays (static or screens) to inform passengers of applicable health protection measures and processes.
- Physical distancing signs and floor markings will ensure that the optimum distance is respected.

Gates/Boarding:

- Additional information for passengers will be required for flights with additional/specific measures imposed by public authorities (e.g. Entry/Exit screening, please see chapter 3.1).
- Physical distancing rules will lead to new boarding procedures, which need to be clearly announced to passengers by the boarding staff prior and during boarding.
- Gate Seating: blocked seats as well as seats reserved for PRM or elderly travellers need to be clearly marked.



ACI EUROPE RECOMMENDATIONS – Information at Arrival

Deboarding:

- Upon landing at the destination airport and while taxiing to the aircraft parking position, airline crews should proceed with informative announcements so that passengers are aware of the COVID-19 related measures in force at the airport, with a particular focus on physical distancing.
- Additional displays are needed where arriving passengers enter the terminal building with clearly visible information on physical distancing rules and other applicable measures (for instance entry screening if required by public authorities).

Border Control, Customs, Lost and Found:

- Information should be displayed, using static and digital screens, to inform passengers on any applicable health protection measures and processes.
- Physical distancing signage and floor markings will incentivise passengers to respect physical distancing.

Baggage Reclaim and Delivery:

- Passengers should be informed of the arrival time of their bag on the belt (first bag on belt display or individual information on smartphone) to avoid unnecessary queuing.
- Physical distancing signs and floor markings will incentivise passengers to respect physical distancing.



ACI EUROPE RECOMMENDATIONS – Information at Connections

In addition to the information provided by air carriers, additional displays are needed at connection checkpoints with clearly visible information on physical distancing rules and other applicable measures.



ACI EUROPE RECOMMENDATIONS – Information at other Touchpoints

Airport Information Counters and Staff:

- Airport staff will play a key role in providing passengers with adequate information and help to reduce their stress levels and anxiety.
- Informative leaflets on physical distancing and other applicable measures should be available, including useful information emphasising possible additional time at each touchpoint. A useful note on what to expect for their returning flight could also be considered.
- The presence of mobile information agents at different touchpoints will contribute to a smooth passenger experience.

Passenger Services (e.g. restrooms, baby rooms, lounges, prayer rooms):

- The operation and use of these facilities will have to be modified in compliance with physical distancing and other applicable measures.
- Users should be informed of all applicable measures through clearly visible displays before entering related premises.
- The maximum number of allowed persons in each of these facilities should be displayed.

Airport Wi-Fi:

- Physical distancing and other applicable preventive measures should be pushed to all those accessing Airport Wi-Fi within the premises.

2.1.5 PHYSICAL DISTANCING AT COMMERCIAL SERVICES

If applied without taking into consideration specific operational constraints, strict physical distancing has a massive impact on the space-constrained operations of most retail, Food&Beverage (F&B) and other commercial outlets. Retail/F&B other commercial units need to operate in the best possible way as they are an essential part of the passenger experience at airports - especially considering that the F&B offering on board aircraft is being reduced. They also employ a significant number of local residents and provide airports with a crucial source of revenue and are essential for their own financial sustainability.



EASA/ECDC RECOMMENDATIONS¹⁹

The reopening of non-essential airport services such as food and beverage services and areas should respect local provisions on similar services outside the airport and the physical distancing measures implemented in other areas of the airport. Where such services are not open, drinking water should be made available (e.g. through water fountains and/or vending machines) giving proper consideration to the enhanced cleaning and disinfection needed.



Dublin Airport / DUB

19. EASA/ECDC COVID-19 Aviation Health Safety Protocol - Operational Guidelines for the management of air passengers and aviation personnel in relation to the COVID-19 pandemic (version 2.0).



ACI EUROPE RECOMMENDATIONS

- Opening of shops and restaurants in airports should follow local/national guidance applicable to all such activities.
- The provision of commercial services should be actively monitored to avoid overcrowding and to enable passengers to maintain physical distancing.
- In order to respect physical distancing, concessionaries need to redefine maximum capacity and control number of persons inside each of the units they manage.
- Concessionaries should ensure signage is clearly visible: “We are open! We are practicing physical distancing, only a few customers in our store at once, thank you for following our practice.”
- Concessionaries need to review the layout of the units they manage to ensure physical distancing amongst customers with the objective of avoiding possible congestion zones.
- Queuing must take place inside the units they manage and only up to a limited amount outside in common use facilities and spaces. In the case of queues outside these units, related queue management and monitoring need to be agreed with the Airport Managing Body, considering the terminal layout and passenger flows in concerned areas.
- For large ‘walk-through’ units, consider streamlined organisation/layout of furniture and display stands to ensure steady and efficient customer flow aligned with physical distancing requirements. This should include supervision of customer access and movements, and optimised central corridor/path in walk-through units.
- Concessionaries should ensure stanchions and physical distancing tape are in place to incentivise customers to respect physical distancing and to guide them through their units.
- Self-service tills may be a useful tool to ensure physical distancing.
- Avoid crossflows inside units to the extent possible.
- If possible, concessionaries should minimise the number of staff required in each unit they manage, avoid shift start and end times that coincide with predicted peaks and implement more staggered break periods for staff.



Groupe ADP

2.2. CLEANING AND DISINFECTION

Contact with contaminated fomites due to the persistence of the virus on surfaces is a route implicated in the transmission of SARS-CoV-2 virus. To reduce the risk of infection through surface contact, it is essential to establish procedures for the correct cleaning and disinfection of airport premises.



GOALS FOR A HEALTHY PASSENGER EXPERIENCE – Cleaning and Disinfection

Cleaning and disinfection of the airport premises need to be enhanced so as to...

- Prevent transmission of COVID-19 through surface contact.
- Provide confidence to passengers that the various touchpoints along the passenger journey are thoroughly cleaned and disinfected, thus ensuring that the premises constitute a safe environment.



EASA/ECDC RECOMMENDATIONS²⁰

- Airport operators and, where applicable, service providers/ suppliers, should enhance the cleaning of public areas in terms of depth and frequency, subject to flight schedules.
- Airport operators should put a procedure in place to ensure that cleaning and disinfection is performed in a consistent manner and following the ECDC guidance.

Cleaning refers to the removal of dirt and impurities, including germs, from surfaces. Cleaning alone does not kill germs. But by removing the germs, it decreases their number and therefore any risk of transmission.

Disinfecting²¹ works by using chemicals to kill germs on surfaces. This process does not necessarily clean dirty surfaces. But killing germs remaining on a surface after cleaning further reduces any risk of transmission.

For additional background information on cleaning and disinfection please refer to Annex 2. Information on specific instructions on how to clean and disinfect hard (non-porous) or soft (porous) surfaces as well as electronics, clothing and other laundry items can for example be found on the US CDC (Center for Disease Control and Prevention) website <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cleaning-disinfection.html>.

20. EASA/ECDC COVID-19 Aviation Health Safety Protocol - Operational Guidelines for the management of air passengers and aviation personnel in relation to the COVID-19 pandemic (version 2.0).

21. For more information and for an indicative list of authorised disinfectant products, please visit the European Chemicals Agency (ECHA) at <https://echa.europa.eu/covid-19>.



ACI EUROPE RECOMMENDATIONS – Cleaning and Disinfection (General)

- Ensure frequent cleaning and disinfection, particularly of frequently touched surfaces such as desks (e.g. check-in, boarding, border control), seats, handrails, handles, knobs, doors, trays, trolleys, touch and tactile devices like self-service kiosks, ATMs, and call buttons.
- The cleaning of public toilets, bathroom sinks and sanitary facilities should be performed with extra care. Consider the use of a disinfectant effective against viruses following the instructions for use provided by the manufacturer.
- Provision of disinfected carpets in areas where most passengers pass, e.g. at entrances to terminal and walkways.
- Ensure that cleaning staff are visible to passengers (e.g. special uniforms with inscriptions “*disinfection professional*”).
- Renegotiate and extend existing contracts with cleaning service providers and implement new SLAs for cleaning and disinfection specifying what, how and how often cleaning and disinfection should be done.
- Define a set of KPIs for cleaning and disinfection (e.g. based on passenger feedback or sampling).
- Establish quality control and inspection processes to ensure that SLAs with defined KPIs will be fulfilled.
- Ensure sufficient supplies of recommended cleaning and disinfecting products are available.
- Use a neutral detergent, followed by decontamination of surfaces using a disinfectant effective against viruses. Several products with virucidal activity are licensed in national markets and can be used following the manufacturer’s instructions. Alternatively, 0.05-0.1% sodium hypochlorite (NaClO) (dilution 1:50, if household bleach is used, which is usually at an initial concentration of 2.5 to 5%) is suggested. For surfaces that can be damaged by sodium hypochlorite, products based on ethanol (at least 70%) can be used for decontamination after cleaning with a neutral detergent.
- Increase the frequency of waste disposal to avoid accumulation of used masks, gloves and other potentially contaminated waste in garbage bins and containers.
- During the closure of airport terminals or part of a terminal, proceed with the deep cleaning of areas which otherwise may be inaccessible under normal circumstances.
- Liaise with local, regional, and/or national health authorities to ensure appropriate local protocols and guidelines, such as updated/additional guidance for cleaning and disinfection, are followed.



- Communicate cleaning and disinfection measures to passengers to provide confidence (e.g. announcements or displays such as “we disinfect desks and handrails every hour”).
- Passengers should be advised through signage to “use elbows” for opening doors.

Specific considerations for restrooms/toilet facilities to reduce cleaning needs and enhance hygiene:

- Install touch-free equipment in restrooms/toilet facilities, such as:
 - automatic toilet flushing system.
 - taps and soap/hand sanitiser dispensers.
 - automated hand towel dispensers and hand dryers.
 - automated doors (if possible).



ACI EUROPE RECOMMENDATIONS – Cleaning Staff

- Adjust the number of staff allocated for cleaning and disinfection in relation to increased requirements.
- Staff should wear personal protective equipment (PPE) when performing cleaning activities. More information on PPE can be found in Annex 3.
- Equipment used for cleaning should be properly disinfected at the end of every cleaning session.
- Proper hand hygiene should be ensured by the cleaning staff each time PPEs are removed.
- Waste produced during the cleaning should be placed in the unsorted garbage.
- Educate staff in performing cleaning, disinfection, and waste management.
- Develop policies for staff protection and provide training for all cleaning staff on site prior to assigning cleaning tasks. Training should include altered cleaning procedures, how to apply disinfectants for different surfaces and materials, how to use and disinfect cleaning material, what PPE is necessary, when to use PPE, how to properly put on, use, and take off PPE, and how to properly dispose of PPE and cleaning material.



Groupe ADP



Edinburgh Airport / EDI

2.2.1 ULTRAVIOLET GERMICIDAL IRRADIATION (UVGI) DISINFECTION

Cleaning and disinfection may leave behind residual contamination. For this reason, Ultraviolet Germicidal Irradiation (UVGI) disinfection can play a role in a multiple-barrier approach to reduce COVID-19 transmission risks.

UVGI is a method of disinfection that uses short wavelength ultraviolet light (UV-C) to inactivate or kill micro-organisms and pathogens. Essentially, UVGI is the use of UV light with sufficiently short wavelengths to disinfect surfaces, air, and water.

Additional information on UVGI disinfection can be found in Annex 2.



Naples International Airport / NAP (this photo is a proof of concept being tested by NAP)



ACI EUROPE RECOMMENDATIONS

The use of UVGI has proved useful for Airport Managing Bodies welcoming high numbers of passengers throughout their different touchpoints, notably:

- Specially designed UV based tunnels to quickly disinfect security control trays and baggage.
- Autonomous cleaning robots and mobile towers to disinfect large surfaces in terminals.
- Handheld devices for rapid deployment.
- Passenger trolley disinfection systems.
- Walk-in UV shoe sanitiser mats.

Please note that UV-C is harmful for the human skin and eyes. Measures must be taken to prevent direct and prolonged exposure. Baffles and rubber flaps should be installed at the extremities of the tunnel to protect passengers and staff from being exposed.

2.2.2 WALK-THROUGH DISINFECTANT MACHINES

Walk-through sanitisers, located at a terminal entrance for instance, may be considered as useful to increase passenger confidence. Passengers go through an automated temperature check before entering the booth and then, once inside, are sprayed with a disinfectant mixture before exiting the device. The full process should be completed within seconds to avoid the creation of queues outside the terminals.

Note: The WHO has warned that spraying individuals with disinfectants (such as in a tunnel, cabinet, or chamber) is not recommended under any circumstances. This could be physically and psychologically harmful and would not reduce an infected person's ability to spread the virus through droplets or contact. Moreover, spraying individuals with chlorine and other toxic chemicals could result in eye and skin irritation, bronchospasm due to inhalation, and gastrointestinal effects such as nausea and vomiting.



ACI EUROPE RECOMMENDATIONS

Walk-through disinfectant machines are NOT recommended by ACI EUROPE.

2.2.2 HAND SANITISER STATIONS

The risk of COVID-19 transmission can be radically reduced by frequent hand washing using soap and water or with alcohol-based solutions, gels, or tissues. The WHO recommends two alcohol-based sanitiser formulations to prevent the spread of pathogens in general (please note that to be effective hand sanitisers must contain at least 60% alcohol).

The first sanitiser comprises:

- Ethanol — 80% by volume (vol/vol)
- Glycerine (also known as Glycerol) — 1.45% vol/vol
- Hydrogen Peroxide — 0.125% vol/vol

The second sanitiser comprises:

- Isopropanol (also known as 2-propanol or isopropyl alcohol) — 75% vol/vol
- Glycerine — 1.45% vol/vol
- Hydrogen Peroxide — 0.125% vol/vol



Munich Airport / MUC



Groupe ADP



ACI EUROPE RECOMMENDATIONS

- Airport Managing Bodies should place sanitising stations at different terminal processing zones (check-in, passport control, security screening, boarding, customs) at every passenger touch point (before and/or after a touch point), along the walkways, at terminal entry/exit points and in or outside restrooms.
- Touchless hand-sanitising stations should be provided where possible.
- Hand-sanitising stations should be sign-posted, easily accessible and clearly visible for PRMs.
- The number of hand-sanitising stations should be provided consistent with expected demand to avoid queues.
- Hand-sanitising stations need to be frequently and preventively refilled to avoid empty stations.
- Alcohol hand gel disinfection should be used universally, with or without gloves, including for children.
- Passengers should be advised to use hand-sanitising gel after every contact point.
- Passengers should also be informed that washing their hands for 30 seconds with soap (at the toilets) is effective to limit the risk of transmission.

2.3 TERMINAL HEATING, VENTILATION AND AIR CONDITIONING (HVAC)

With the aim of improving air quality and quickly eliminating light, airborne particles emitted from individuals, and preventing them from landing on surfaces, the airport operator should carry out adequate checks of aeraulic systems before reopening and during operations. Those checks include air flow rates, air changes according to the number of people and air quality measurement. Enhancement and/or installation of new hardware and software systems for air management must be implemented. These interventions must be coordinated with any functional adjustments of spaces and routes intended for passengers and staff, as part of the terminal's overall plan.

HVAC systems exist in many formats. They can be described, however, as a recirculating system with a portion of outside air added continually whilst a similar portion is exhausted. The outside air rate can be varied in many systems. Air is filtered before recirculation and moved around the systems using fans. Heating and cooling are typically provided by finned coils using heated or chilled water.



GOALS FOR A HEALTHY PASSENGER EXPERIENCE

Terminal heating, ventilation, and air conditioning (HVAC) need to be optimised to...

- Reduce the risk of airborne transmission of COVID-19.²²
- Build confidence for passengers by the provision of fresh air throughout their journey at the airport.



EASA/ECDC RECOMMENDATIONS²³

- Heating, ventilation, and air conditioning (HVAC) systems should be optimised to ensure a high rate of air change.
- In older facilities, subject to airport/terminal constructions and meteorological conditions, windows can be kept open for additional supply of fresh air, subject to the absence of horizontal air flow.



Hermes Airports

22. WHO, *Transmission of SARS-CoV-2: implications for infection prevention precautions*, July 2020.

23. EASA/ECDC *COVID-19 Aviation Health Safety Protocol - Operational Guidelines for the management of air passengers and aviation personnel in relation to the COVID-19 pandemic (version 2.0)*.



ACI EUROPE RECOMMENDATIONS

- Perform a general check of all existing air ventilation systems according to the following recommendations and applicable technical standards.²⁴
- For existing ventilation system, verify if the actual occupied room air flow rates comply to technical standards and local regulations.²⁵
- Optimise air conditioning and ventilation in all spaces to maintain humidity within acceptable ranges.
- Increase outdoor air ventilation rates in occupied spaces above the minimum required by the technical regulations, even considering all the other concerns of a proper management of the HVAC system (e.g. the energy consumption).
- Keep systems running longer hours (24/7), if possible, adapting the outdoor flow rates to the actual occupancy density. Switch ventilation to nominal operating conditions at least 2 hrs before building usage time and switch to minimum operating conditions 2 hrs after usage time.
- Minimise the air recirculation systems as much as possible.
- Keep outdoor air intake and exhaust air expulsion points distant from each other and from polluted area and from high density occupied areas.
- HVAC maintenance should be carried out as prescribed by the manufacturer and applicable technical standards.
- Replace central outdoor air and extract air filters strictly according to maintenance schedule.
- Filter replacement and maintenance works shall be performed with common protective measures including PPE (personal protective equipment – see chapter 2.4 Use of face masks).

24. e.g. EN16798-17 "Ventilation for buildings guidelines for inspection of ventilation and air conditioning systems".

25. e.g. EN 16798-1 and 3 "Ventilation for buildings for non-residential building - Performance requirements for ventilation and room-conditioning systems".

Additional advice²⁶:

Increasing outdoor air ventilation rates will improve indoor air quality and the comfort and well-being of passengers and airport staff. However, due to the complex nature of calculating the required increased levels, improvements should be evaluated on a case-by-case basis²⁷. For example, should an increase in outdoor air ventilation be considered, it is essential to include a recording of air pollutants and associate the flow rate with the *actual* people density, to avoid an unnecessary increase in energy consumption for heating and cooling.

Filtration in HVAC systems can be a part of an overall SARS COV-2 virus risk mitigation approach even if there is no scientific evidence of direct and proven benefits. To maintain a good sanitary level in each ventilation system, the minimum combined filtration efficiency has to meet at least the technical standard requirements. Special attention must be given to the air filtration of recirculating air systems.

Humidification and heating have no practical effect. Coronaviruses are quite resistant to environmental changes and are susceptible only to very high levels of humidity (above 80%) and temperature (above 30°C), which are neither achievable nor acceptable.

Safe use of heat recovery sections: virus particle transmission via heat recovery devices is not an issue when a HVAC system is equipped with a twin coil unit or another heat recovery device that guarantees 100% air separation between return and supply side.

Room air cleaners can be useful in specific and rather limited situations, as the area they can effectively serve is normally quite small, typically less than 10 m².

2.4 USE OF FACE MASKS²⁸



GOALS FOR A HEALTHY PASSENGER EXPERIENCE

The use of face masks by passengers and staff within the airport premises should be encouraged to...

- Reduce the risk of airborne transmission of COVID-19.²⁹
- Help health-concerned passengers feel safer when seeing all passengers and staff wearing face masks.
- Provide a safe passenger end-to-end journey with special consideration for transfer passengers.

26. REHVA – Federation of European Heating, Ventilation and Air Conditioning Associations - COVID-19 guidance document, April 3, 2020.

27. As reference, Leadership in Energy and Environmental Design (LEED) consider a real benefit to increase ventilation to all occupied spaces by at least 30% above the minimum rates required.

28. ECDC, *Using face masks in the community. Reducing COVID-19 transmission from potentially asymptomatic or pre-symptomatic people through the use of face masks*, 8 April 2020.

29. WHO, *Transmission of SARS-CoV-2: implications for infection prevention precautions*, July 2020.

The widespread use of face masks in airport premises increases confidence for health-concerned passengers. Face masks are effective in limiting transmission risks and especially useful in dealing with higher concentrations of people in areas where physical distancing will always not be possible. They are complementary to other measures already in place to reduce transmission. Face masks have been used extensively in the public in Asian countries and have been linked to a slightly lower risk of SARS among persons without known contact with SARS patients during the 2003 SARS epidemic. Non-medical face masks and other face covers made of textiles have the advantage that they can be produced easily, are widely available and are washable and reusable.

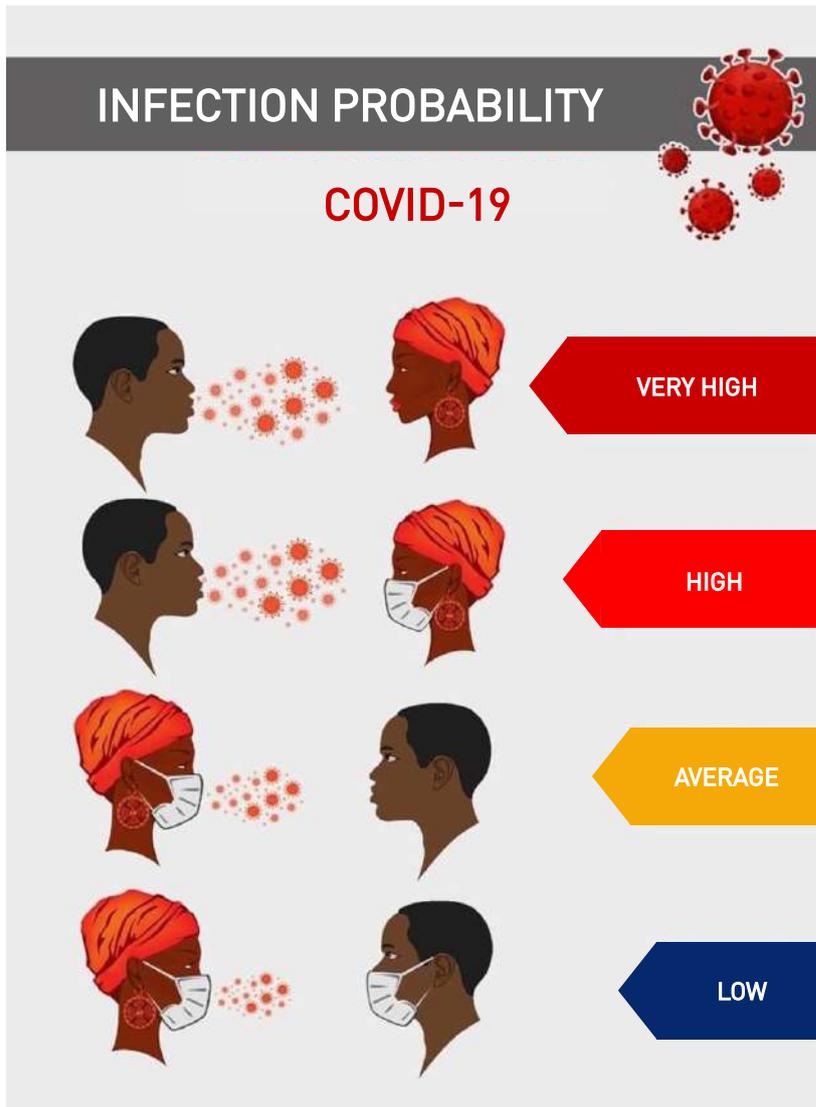


Munich Airport / MUC

The following picture illustrates the rationale behind the usage of face masks for passengers while coughing or sneezing.



PICTURE 5 – RATIONALE BEHIND THE USE OF FACE MASKS (COUGHING AND SNEEZING)³⁰



Additional information on types of masks, scientific evidence, and rationale for the use of face masks can be found in Annex 2.

30. ACI AFRICA, *Guidance for African Airports Restart*, May 2020.



EASA/ECDC RECOMMENDATIONS³¹

- The use of medical face masks should be recommended for all passengers and persons at the airport terminal.
- Exemption to this obligation can be made for instances where otherwise specified, such as during security or identification control.
- Children under 6 years of age and people that cannot wear a face mask due to medical reasons can also be exempted.
- Passengers should be reminded that, typically, face masks should be replaced after being worn for 4 hours, if not advised otherwise by the face mask manufacturer, or when they become wet or soiled, and that they should ensure a sufficient supply of face masks for the entire duration of their journey.
- Nevertheless, aircraft operators and airport operators should also consider making face masks available (e.g. vending machines).
- The use of face masks should be considered only as a complementary measure to physical distancing and, in addition, passengers should be required to observe the following measures at all times unless otherwise advised by airport staff or aircrew members:
 - Hand hygiene by meticulously washing their hands with soap and water or, where this is not available, using alcohol-based hand-sanitising solution.
 - Respiratory etiquette by covering the mouth and nose with a paper towel cover or a flexed elbow when sneezing or coughing, even when wearing a face mask.
 - Limiting direct contact (touch) of any surfaces at the airport and in the aircraft to only when absolutely necessary.



Düsseldorf Airport / DUS

31. EASA/ECDC COVID-19 Aviation Health Safety Protocol - Operational Guidelines for the management of air passengers and aviation personnel in relation to the COVID-19 pandemic (version 2.0).



ACI EUROPE RECOMMENDATIONS

European states have different approaches regarding the use of medical or non-medical face masks. For this reason, the discussion and clarification of this matter with national health authorities is strongly recommended.

The use of face masks within the airport premises should be encouraged by:

- Informing and reminding passengers through staff, social media, airport website, displays, announcements, leaflets, etc. before and during their journey that wearing face masks is mandatory at all times or at least highly recommended (depending on local legislation).
- Making face masks available at airport premises through vending machines or specialised retail outlets.

Airport Managing Bodies should provide information (website, social media, displays) to passengers on how to effectively use face masks, based on the following instructions:

- Face masks should be replaced after 4 hours or earlier.
- The face mask should completely cover the face from the bridge of the nose down to the chin.
- Clean hands with soap and water or alcohol-based hand sanitiser before putting on and taking off the face mask.
- When taking off the face mask, remove it from behind, avoiding touching the front side.
- Dispose of the face mask safely if it is disposable.
- Wash your hands or apply alcohol-based hand sanitiser immediately after removing the face mask.
- Washable, reusable face masks should be washed as soon as possible after each use, using common detergent at 60°C.

2.5 PROTECTIVE SCREENS



GOALS FOR A HEALTHY PASSENGER EXPERIENCE

Protective screens at touchpoints between passengers and staff should be implemented to...

- Reduce the risk of airborne transmission of COVID-19.
- Provide confidence that interactions between passengers and staff are safe.

It is important to underline that at staffed touchpoints such as manned check-in desks, operational constraints make it impossible to guarantee and enforce physical distancing. For this reason, protective screens may be a useful means of risk mitigation.

Protective screens (mobile solutions or fixed at counters) are a feasible approach to protect staff and passengers at the same time.



EASA/ECDC RECOMMENDATIONS³²

Where airport/aircraft operator staff interact with passengers from a fixed location, such as check-in counters, ticketing, passport control, and information desks, protective screens should be installed in such a way as to allow the handover of the documents required but protect staff from the respiratory droplets of passengers and vice versa.



ACI EUROPE RECOMMENDATIONS

- At selected touchpoints, and where possible, screens to protect passengers and staff should be installed.
- These touchpoints include counters (check-in, boarding, information, and services such as lost and found), checkpoints (security, border control, customs, health checks) and commercial services (cash desks, sales counters, bars).
- Depending on the specificities of the concerned touchpoint, the material to be used may be:
 - Glass.
 - Plastic: Thermoplastics (acrylic for instance), Polycarbonate (PC).



Groupe ADP

32. EASA/ECDC COVID-19 Aviation Health Safety Protocol - Operational Guidelines for the management of air passengers and aviation personnel in relation to the COVID-19 pandemic (version 2.0).



PROCESSES



As stated in the ACI EUROPE *Guidelines for Passenger Services at European Airports*, the processes constitute the second pillar of the passenger experience (together with premises and people). This set of essential and extremely diverse procedures constitutes the core of passenger-related airport activities throughout the end-to-end passenger journey.

This chapter includes the following:

- New requirements imposed by European states in face of the current (or future) pandemics/sanitary crises that may result in additional processes: Entry/Exit screening, rapid testing, immunity passports.
- The reorganisation of the “traditional” airport processes in order to comply with additional requirements for a healthy passenger journey.
- The role of technology.
- PRM assistance.
- Contingency planning.



GOALS FOR A HEALTHY PASSENGER EXPERIENCE – Processes

Ensure a healthy passenger experience by...

- Fulfilling national requirements for Entry/Exit screening (Chapter 3.1).
- Reorganising and optimising processes throughout the passenger journey (Chapter 3.3).
- Using new technologies and innovation (Chapter 3.4).
- Implementing changed processes for PRM assistance (Chapter 3.5).
- Efficient contingency planning (Chapter 3.6)

3.1 ENTRY/EXIT SCREENING

Entry/Exit screening consists of public health measures implemented at points of entry (ports, airports, land-crossings) for travellers departing from or arriving in a country, with the objective of assessing their exposure to a biological agent (bacterium, virus, parasite) and/or the presence of symptoms. Entry/Exit screening is part of policies and measures devised by competent authorities to control disease spread and to minimise the impact on travel and trade, which can be severely affected by the absence of adequate measures or lack of capacity to implement these measures.



GOALS FOR A HEALTHY PASSENGER EXPERIENCE

If Entry/Exit screening measures are required, they should be implemented in a way that...

- Provides confidence to passengers and generally improves health safety.
- Keeps end-to-end passenger journey disruptions to a minimum.
- Passengers are well informed of any screening measures before they start their journey and understand their usefulness.
- Results are as reliable as possible and false results are kept to a minimum.
- Passengers know their screening results as early as possible and can be swiftly cleared to fly and to enter the country of destination without being quarantined.

When screening measures have to be applied, consider the following³³:

Should health screening measures be necessary, they should be introduced as upstream as possible in the passenger process, while minimising impact on operations. It is preferable for passengers to arrive at the airport *“ready to fly.”*

If measures for on-airport screening are mandated by the competent authorities, they should be delivered in a way that minimises disruptions to airport operations. Large scale testing on-airport is likely to result in the creation of additional crowds and queues as well as in increased dwell time at airports. This would be counterproductive in terms of physical distancing and could result in unwarranted concerns about the safety of air travel. They could also result in unnecessary security risks and safety hazards.

If health screening is required by local authorities or is the chosen option of an airport, a variety of options are available. These are generally designed to prevent symptomatic passengers from travelling and further spreading the virus to staff and other passengers.

There is no perfect health screening solution and, if required, it is usually a combination of measures that tends to provide best results. This gives the opportunity to use a risk-based approach, combining several processes to identify when additional secondary health checks are required.

Generally, it can be assumed that³⁴:

- Each passenger could be carrying SARS-CoV-2, but without any symptoms or temperature.
- Some passengers with mild symptoms might still attempt to travel.

33. ACI WORLD, *Aviation Operations During COVID-19 Business Restart and Recovery*, May 2020.

34. *Sanitary & SARS-Cov-2 Containment Measures at Airports*, June 2020, ACI EUROPE, Professor Ashley Woodcock et al.

Benefits of Entry/Exit screening:

- Obtaining contact information for travellers that can be used for contact tracing or public health observation purposes.
- Educating and informing the traveller passing through the points of entry.
- Linking travellers with public health authorities for the duration of the incubation period to facilitate health monitoring and prompt referral for care if they become ill.
- Facilitating rapid and appropriate clinical care for infected travellers.
- Maintaining and preserving public confidence that air travel is safe (if screening methods are sufficiently reliable in detecting COVID-19 infections).
- Dissuading infected persons from travelling by air.
- Relieving political and social pressure and limiting negative economic consequences from travel and trade restrictions.

Adverse effects of Entry/Exit screening:

- The ECDC does not support Entry/Exit screening as an efficient measure for detecting travellers with infectious diseases since none of the screening methods have proven entirely accurate. In the case of COVID-19, the inefficiency is the low sensitivity of Entry/Exit screening to detect mildly symptomatic infections and their inability to detect asymptomatic cases (false negatives).
- Entry/Exit screening might identify passengers with other types of infection which provide no risk to other people (false positives).
- Highly resource demanding (WHO: *"It is generally considered that entry screening offers little benefit while requiring considerable resources"*). Investing in Entry/Exit screening reduces resources available for more effective mitigation and prevention measures.
- Needs specific areas to install screening devices which may not be available at all airports and interfere with airport operations and passenger flows.
- Passengers will experience an additional process resulting in waiting time and additional time spent at airports.
- Queuing before Entry/Exit screening constitutes an additional risk for COVID-19 transmissions.
- May give the passengers and the public a false sense of safety.
- Risk of stigmatisation of travellers required to undergo additional examination/secondary screening.
- Language barriers - flight announcements about screening measures and verbal requests made to passengers may not be comprehensible to all passengers.
- Impact on airport and air carrier operations. For example, liability in case of missed flight due to cases of a false negative.



EASA/ECDC RECOMMENDATIONS³⁵

- EASA and ECDC do not recommend thermal screening due to its limitations and little evidence of effectiveness in detecting COVID-19 cases.
- In order to avoid a duplication of procedures, passengers that arrive from EU/EEA flights and that have been subject to thermal screening at the departure airport should be exempted from entry thermal screening at the arrival airport.



ACI EUROPE RECOMMENDATIONS

- An effective application of Entry/Exit screening (notably temperature checks) requires an EU and internationally agreed common approach.
- Public funding of equipment and staff should be guaranteed if Entry/Exit screening is required by national legislation.
- If required, Entry/Exit screening should be implemented:
 - Only once during the passenger journey, i.e. a single step process.
 - As early as possible in the passenger journey, preferably before departure.
 - Under conditions that minimise impact on airport operations and the passenger experience – notably throughput across the different touchpoints.
 - By professional medical staff.

³⁵. EASA/ECDC COVID-19 Aviation Health Safety Protocol - Operational Guidelines for the management of air passengers and aviation personnel in relation to the COVID-19 pandemic (version 2.0).

3.1.1 PLANNING AND IMPLEMENTATION OF ENTRY/EXIT SCREENING MEASURES

In case Entry/Exit screening measures need to be implemented at an airport, those measures need to be carefully planned. For Entry/Exit screening new processes have to be defined, space requirements need to be determined and efficient layouts for the set-up of screening areas have to be identified.

Processes and the space needed depend on the screening requirements imposed by local authorities such as:

- Requested screening methods and technologies.
- Entry screening for all arriving flights or only for flights arriving from certain “high-risk” countries.
- Exit screening for all departing flights or only for specific flights depending on the country of destination.
- Exemption of certain passengers (e.g. in case of accepted health certificates, or transfer passengers).
- Specific facilities requested by local health authorities for their own staff, equipment, and procedures.

Screening processes and location:

- Processes and location for Entry/Exit screening depend on the requirements imposed by local authorities.
- Entry/Exit screening processes can be divided into primary and secondary screening.
 - Primary screening includes an initial assessment. Initial assessments can consist of visual checks (observations), checking of COVID-19 statements/self-declarations and screening of travellers’ body temperature. Travellers who have a temperature above a certain level, signs, or symptoms of an infectious disease, or have been potentially exposed to infectious people, are referred to secondary screening.
 - Secondary screening should be carried out exclusively by personnel with public health or medical training. It could include an in-depth interview, a focused medical and laboratory examination, a second temperature measurement or a test (if suitable and reliable methods become available). A positive secondary screening could result in quarantine, hospitalisation or refusal of entry into a country. All processes for positive screening results need to be defined by health authorities.

- Locations of primary and secondary screening can include:
 - On board (for arrival flights).
 - At the point of deboarding (entry screening for specific “high-risk” flights).
 - At a central location after deboarding and before immigration in the terminal (entry screening for all or a large number of flights).
 - Before arriving at the airport (for departures).
 - Before or right after entering the terminal (exit screening for all flights).
 - Before or at security control (exit screening for all flights).
 - Before border control (exit screening for all international/Non-Schengen flights).
 - Boarding gate (exit screening for specific flights in case of requirements by country of destination).

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 - At a central location after deboarding and before immigration in the terminal (entry screening for all or a large number of flights).
 - Before arriving at the airport (for departures).
 - Before or right after entering the terminal (exit screening for all flights).
 - Before or at security control (exit screening for all flights).
 - Before border control (exit screening for all international/Non-Schengen flights).
 - Boarding gate (exit screening for specific flights in case of requirements by country of destination).
- A particular challenge for defining the best processes and screening locations are the exemption of certain passengers from screening measures such as passengers with an accepted health certificate or connecting passengers who will not enter the country.

Space requirements can be determined by the following steps:

- Forecast of peak flight schedules (only flights which are subject to screening measures) and behaviour patterns at the point of screening.
- Determination of the load factor on aircraft and related passenger peaks.
- Determination of screening process times.
- Definition of service levels for the checkpoint (space per passenger to comply with physical distancing requirements, maximum waiting times, and others).
- Determination of required queuing space and number of screening points (desks, lanes, screening devices).
- Space requirements per screening point without queuing space depend on the size of the needed equipment (desks, screening devices).
- Additional space needs to be added to allow for passenger flows before and after the checkpoint.
- If secondary screening is required: the needed space can be determined following the steps above based on an assumed percentage of passengers being required to undergo secondary screening.
- Space for staff rooms including restrooms, offices, storage needs to be considered.
- Interview space must be available as required by the International Health Regulations 2005 (<https://www.who.int/ihr/publications/9789241580496/en/>).
- Further essential resources include capacity for laboratory diagnosis, quarantine, isolation, and treatment of suspected cases; spaces for those resources can be provided in separate facilities inside or outside the airport premises.

Various solutions for entry or exit screening have already been implemented at some European airports. However, ACI EUROPE is not in a position to provide specific recommendations until reliable and efficient screening methods to detect COVID-19 infections become available.



Madrid-Barajas Adolfo Suárez Airport / MAD

3.1.2 TECHNOLOGY FOR THERMAL SCREENING

Thermal screening at airports tends to be controversial. Methods include full-body infrared scanners (which measure skin temperature as a proxy for core body temperature), handheld infrared thermometers and ear gun thermometers.

Technology	Pros	Cons
Infrared Tympanic (ear) Thermometers	<ul style="list-style-type: none"> • Easy to use. 	<ul style="list-style-type: none"> • Can be inaccurate due to ear wax or insufficient straightening of the ear. • Requires more personnel for screening. • Risks associated with close contact.
Non-contact Infrared Thermometers (NCIT)	<ul style="list-style-type: none"> • Some NCITs approved for use as thermometers. • Measurement of temperature without touching a passenger. • As accurate as contact thermometers. • Low cost. • Easy training. • Easy to use. • More accurate than thermal scanner cameras. • Number of different products available commercially. 	<ul style="list-style-type: none"> • Measures skin temperature (not core body temperature). • Assessed to perform only moderately well in detecting fever. • Requires more personnel for screening. • Slower for screening large numbers of passengers. • Some NCITs need a confirmation measurement of temperature to increase accuracy.
Thermal Scanner Cameras (TSC)	<ul style="list-style-type: none"> • TSCs can measure temperature from a greater distance. • TSCs can be used to screen large numbers of passengers. • Faster operations. • Less disruptive. 	<ul style="list-style-type: none"> • Not evaluated for use as a primary diagnostic tool or for screening multiple individuals in an uncontrolled environment. • Not as accurate as NCITs. • Low specificity. • More difficult to use effectively. • None of the TSCs are approved to be used alone to measure temperature. • Significantly more expensive. • Measures skin temperature (not core body temperature). • Affected by changes in environmental conditions. • TSCs tend to be used with higher thresholds of fever to avoid detecting too many false positive febrile passengers. • TSCs require very strict application of standards in order to perform accurately.

Remarks for NCIT:

- Sensitivity 80–99%, meaning that 1% to 20% of febrile passengers will not be detected (false negative).
- Specificity 75–99%, meaning that 1% to 25% of non-febrile passengers will be reported as febrile (false positive).

In Summary:

Use of Thermal Screening for Infectious Diseases:

- Has not proven to be effective to prevent or delay transmission.
- Is able to detect travellers presenting with a high fever with an appropriate level of performance when using appropriate equipment operated by trained staff.
- Requires protocols and resources to further investigate possible febrile passengers.

3.1.3 COVID-19 STATEMENT/DECLARATION



EASA/ECDC RECOMMENDATIONS³⁶

In line with the applicable data protection requirements, passengers should read and understand the aircraft operator's COVID-19 policy preferably before arrival at the airport, during the online check-in process, or via a text message (SMS) link or other means acceptable to the national authorities.

Statements on COVID-19 status would help:

- Increase the performance of screening.
- Identifying possibly contagious travellers not identified by temperature screening e.g. due use of antipyretic drugs.
- Identifying travellers with high-risk exposure and help to enrol them in monitoring schemes or quarantine.



ACI EUROPE RECOMMENDATIONS

If a COVID-19 statement is required, Airport Managing Bodies should coordinate with air carriers in order to ensure this is done in electronic format and prior to passenger arrival at the airport (for entry and exit).

36. EASA/ECDC COVID-19 Aviation Health Safety Protocol - Operational Guidelines for the management of air passengers and aviation personnel in relation to the COVID-19 pandemic (version 2.0).

3.2 TESTING AND IMMUNITY PASSPORTS

Rapid testing and immunity passports have sometimes been cited as alternatives to Entry/Exit screening and other measures for air travel.

An immunity passport would certify that a person has contracted COVID-19, recovered, and has the antibodies required to be immune - thus allowing that person to travel with no transmission risks to others.

Tests should be performed and conducted before travelling, allowing travellers to be issued a "risk free" certificate, an immunity/hygiene passport, or perhaps a simple barcode for a smartphone application as proof of suitability for travel. Currently, there are two types of tests available: the antibody "rapid" tests and the molecular swab tests. The antibody tests, with the selection of a few drops of blood, provide results within 15 minutes. This test detects whether the patient was infected with the virus in the past, now has immunity and is fit to travel without the risk of spreading the virus. With the molecular tests, genetic material is purified from a patient's clinical sample such as a nasal swab. This test detects whether the virus is present at the time of testing. Results may take up to 7 hours to be produced.



EASA/ECDC RECOMMENDATIONS³²

There is currently limited evidence on immunity and protection against COVID-19 disease provided by antibodies detected in the sera of recovered patients. The quantity, quality, and duration of the human immune response to SARS-CoV-2 is, as yet, unclear. In addition, we lack validated serology tests that can ascertain immunity to the virus.

ACI EUROPE is continuously monitoring scientific developments and proven solutions and will update its recommendations where applicable.



ACI EUROPE RECOMMENDATIONS

As a guiding principle, avoid extensive on-airport large scale testing. Large scale testing on-airport is likely to result in the creation of crowds, queues and additional dwell time and would be counterproductive in terms of physical distancing.

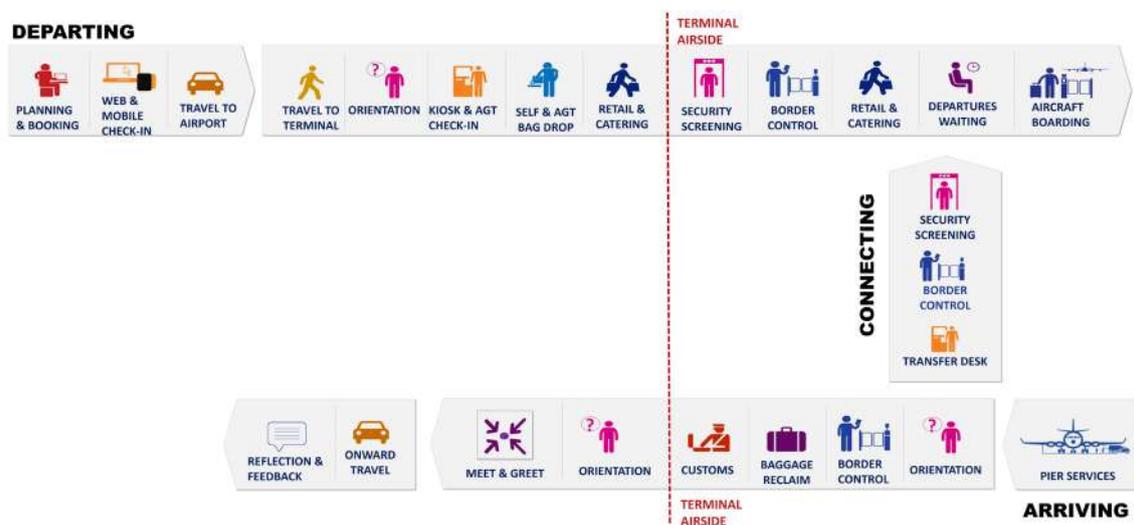
3.3 RE-ORGANISATION OF THE “TRADITIONAL” PROCESSES

This chapter aims to provide recommendations on the reorganisation of the touchpoints of the passenger journey, reviewing the current passenger journey, as shown below, and the different touchpoints involved.



PICTURE 6 – THE PASSENGER JOURNEY

Source: SITA



The passenger journey involves the participation of different stakeholders, each with a specific role and deploying their own solutions. The ideal passenger experience should be seamless and ensure the highest level of satisfaction across the different touchpoints. The modern day “connected passenger” expects travelling to be an integrated end-to-end experience.

Measures taken to protect passenger health might generate stress at touchpoints due to additional requirements such as increased hand hygiene, physical distancing, additional queues and waiting time - even if managed in an orderly manner - and generally longer passenger processing times. Being attended by staff wearing a face shield, and possibly fearing interactions with staff or other travellers, may result in increased negative emotions and stress levels for passengers.

It is possible that, before arriving to the airport, passengers may already feel confused and anxious over the measures they will have to abide by at the airport. Stress points along the passenger journey may change or evolve as a result of the pandemic and should be monitored as the industry recovers. Identifying the most stressful processes at an airport will help to focus on initiatives and changes needed to ensure a healthy passenger experience.

Passengers may also feel positive emotions at those touchpoints where technology which reduces such interaction has reached a mature stage and is widely used.



GOALS FOR A HEALTHY PASSENGER EXPERIENCE

Processes along the passenger journey need to be reorganised and optimised in a way so as to...

- Prevent COVID-19 infections through airborne transmission or surface contact.
- Provide confidence to passengers that the journey through the airport with its various touchpoints is safe.
- Minimise the overall time spent in airport terminals and hence optimise the number of people inside terminals.
- Minimise disruptions (e.g. process and waiting times) involved with additional health measures.
- Reduce direct physical contact with staff and surfaces at touchpoints.

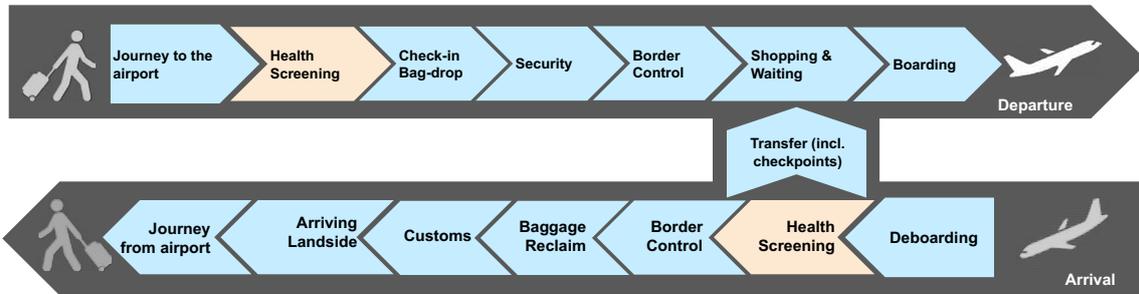
It should be noted that the adoption of some of the measures described in these Guidelines may be subject to a regulatory mandate with which the airport has to comply. This might result in the introduction of additional touchpoint(s) in the passenger journey. For example, the Entry/Exit screening to be carried out whenever a country's health authorities specifically require it will modify the passenger journey by introducing new checkpoints as shown below and on the next page.



Manchester Airport / MAN



PICTURE 7 – ENTRY/EXIT SCREENING AS A NEW TOUCHPOINT OF THE PASSENGER JOURNEY
(SOURCE: TH AIRPORT CONSULTING)



Source: SITA

Please note: The reorganisation of existing processes also implies a revision of all related SOPs (standard operation procedures) and process manuals.



ACI EUROPE RECOMMENDATIONS – General

- Process capacities need to be reviewed at each touchpoint throughout the passenger journey considering:
 - New process times.
 - Maximum waiting times.
 - Available queuing spaces with physical distancing.
 - Available resources (e.g. counters, lanes, staff).
- Electronic ticketing and boarding passes should be used in order to minimise interactions with staff at airports and reduce queuing.
- It is essential to minimise any touchpoints throughout the passenger journey.

The following chapters cover the main touchpoints of the passenger journey and provide solutions for a healthy passenger experience including any process changes.

3.3.1 AT HOME - PRE-TRAVEL

At Home

Current Issue: Promote all processes that passengers can perform at home before arriving at the airport.

Stakeholders: Airport Managing Body, air carriers.

ACI EUROPE RECOMMENDATIONS	
Operational Measure/Technology	Changes to the Processes
<ul style="list-style-type: none"> Promote online check-in (Consideration: Promote processes through app). Biometric registration (Consideration: Integration of new technology like identity validation through app). Bag tag printed at home (Consideration: Ensuring safety of staff handling baggage). Facilitate the use of bag collection services to the passenger's home or hotel address (Consideration: Valid bag tag printed at home). 	<ul style="list-style-type: none"> Processes to be done by the passenger via app: <ul style="list-style-type: none"> Boarding Pass Check in baggage Payments for excess or ancillary services. Make the registration in the biometric database through the airport app or airline app. Self-service bag tag printing at home preventing contact with equipment and staff at the airport. Sanitisation of bags before entering the Baggage Handling System (BHS). Agent self-sanitisation when hand handling bags. Sanitisation of baggage at or before collection.

Implications for People and Premises

Premises: Travelling without baggage through a range of services such as off-airport baggage Check-in, door-to-door/door-to-airport/airport-to-door baggage services can be widely adopted to reduce stress and space constraints within the terminal.

People: Bag sanitisation before collection.

Other Considerations (financial – implementation – pros and cons)

Self Service Bag-tag printing at home will increase the efficiency in passenger departure handling when air travel returns to normal levels.

3.3.2 ACCESS

Arrival at/Entry to Terminal

Current Issue: Ensure only passengers are allowed to enter the terminal building, adherence to physical distancing rules.

Stakeholders: Airport Managing Body, Ground Handlers, Public authorities.

 ACI EUROPE RECOMMENDATIONS	
Operational Measure/Technology	Changes to the Processes
<ul style="list-style-type: none"> Boarding Pass readers at terminal entrances (Consideration: Ensuring safety of staff monitoring the bar code readers and scanners). FIDS and/or Displays and Banners to provide health and safety information (Consideration: Low to produce information banners; Queue Management to ensure physical distancing; Floor markers and queue monitoring devices). People counting staff at all entrances and exits throughout the terminal (Consideration: Potential to leverage bar code readers). Virtual Assistants (VA) to provide health announcements (Consideration: Location of installed devices to avoid clutter or visual obstacles). Computer Vision and Artificial Intelligence applied to monitor areas where it is difficult to maintain the physical distance. Feed from existing CCTV (close circuit TV) cameras to provide video analysis with a heat map showing where large concentration impact distancing (Consideration: Maturity of the solution; System integration/interfaces with other systems). IoT sensors to monitor density information by providing anonymous real-time occupancy data. Wayfinding: complementing the airport's mobile app to ensure that passengers know where to find the facilities, including messages about physical distancing, changes in procedures, and other health related information. 	<ul style="list-style-type: none"> Travelling passengers must have a valid boarding pass to enter the terminal. Non-travelling public restricted access. Health warnings and announcements broadcast at key entrances of the airport premises. Monitoring the number of passengers and staff in all areas throughout the terminal.

Implications for People and Premises

Premises: Passenger screening area (either inside the terminal or off-terminal)/Special entrance for airport staff and staff working at the airport/Queue Management with markings to ensure physical distancing.

People: Airport staff trained and redeployed to use thermal scanners/adequate use of PPE/Enforcement of health warnings.

Other Considerations (financial – implementation – pros and cons)

- Recommendations must be aligned with national guidelines and regulations.
- Location of the access screening process:
 - Prior to entering the terminal (i.e. making the terminal a sterile area).
 - Inside the terminal in a dedicated area (i.e. assign one entrance and one exit door to the terminal).
 - Sufficient and adequate space to ensure physical distancing requirements.
- Implementation should balance what is going to be a temporary measure and what will become permanent. For example:
 - Implementing fixed thermal scanners at entrance versus a mobile thermal scanner.
- Installation of a FIDS screen or display device. Flight information display systems (FIDS) should have a content management feature to allow the creation of the messages and to broadcast on different displays.
- Continuous broadcast of health messages using screens, banners, and virtual assistants.
- Extension, where possible, of physical distancing measures to car parks, taxi, bus, and train station areas that are connected to the terminal.
- Creation of different pathways for arrival and departing passengers to avoid contamination.
- Identification of areas for passenger screening/test if required and management of emergency situations.
- Fast track access points extended and/or placed already at the terminal entrance (to boost ancillary revenue) as a dedicated terminal entrance.



Rome–Fiumicino International Airport / FCO

3.3.3 CHECK-IN

Agent Assisted and Self Check-in

Current Issue: To ensure existing check-in processes safeguard the health and safety of passengers and staff.

Stakeholders: Airport Managing Bodies, air carriers, ground handlers.

 ACI EUROPE RECOMMENDATIONS	
Operational Measure/Technology	Changes to the Processes
<ul style="list-style-type: none"> Self-service kiosks (SSK) with facial, thermal and voice recognition and Chip & Pin card reading technology (Consideration: Integration of all new technology into existing Kiosks and/or A/L Common-use self-service (CUSS) Application; Ensuring physical distancing in the current layout; SSK relocating in line with physical distancing). Autonomous kiosks with capabilities for biometric registration or check-in. Mobile check-in and Advance Passenger Information (API) to print boarding pass and bag tags in any location without agent interface. Bag Tag printing kiosk. Automated Bag Drop (Consideration: Retrofit of counters or replacement). New allocation rules for check-in desks to include constraints stemming from the surrounding check-in area (Consideration: Impact on operations). Acoustic spotlight to enforce physical distancing whilst waiting. Installation of protective screens at check-in counters (Consideration: Potentially a temporary solution to reinforce confidence of the passenger). 	<ul style="list-style-type: none"> Limited agent-facing activities: <ul style="list-style-type: none"> Unaccompanied Minors (UM) and Persons with Reduced Mobility (PRMs) All other processes to be done by the passenger via self-service such as: <ul style="list-style-type: none"> Boarding Pass Check in baggage Payments for excess or ancillary services Sanitisation of kiosks and desks. Spacing between desks (generates new constraints in allocation and terminal capacity). Use available flow arrows to manage crowds.

Implications for People and Premises

Premises: Need to account for extra space for Self Service.

People: Staff need to ensure that passengers can respect physical distancing rules (queuing setup, reminders to passengers to keep their distance, timely opening of a sufficient number of check-in desks).

Other Considerations (financial – implementation – pros and cons)

- Imposing physical distancing during self-service check-in should take into consideration:
 - Switch off some kiosks to comply with distancing requirements.
 - New layout and repositioning of the kiosks need to be considered in terms of implementation timeframe, costs, and operational impact.
 - Use of autonomous kiosks - as these are fitted with batteries, they can be repositioned to allow for physical distancing: however, cost may be an issue.
 - Acoustic spotlight is a directional sound system that creates a tight, narrow beam of sound that can be controlled with the same precision as light. The speaker can be aimed at desired listening areas and so keeping the sound focused specifically on the subject. Potential cost implication.
- Wide adoption of off-airport check-in services may alleviate the impact of physical distancing on terminal capacity.
- Real capacity must be regularly assessed based on the new constraints.



Bologna Guglielmo Marconi Airport / BLQ

3.3.4 BOARDING PASS CHECK

Boarding Pass Check

Current Issue: Before the passenger enters the security screening area, some airports carry out a boarding pass check/validation. A contactless procedure should be ensured as well as ensuring physical distancing - especially during peak hours of operation.

Stakeholders: Airport Managing Bodies, air carriers, ground handlers, sub-contractors.

 ACI EUROPE RECOMMENDATIONS	
Operational Measure/Technology	Changes to the Processes
<ul style="list-style-type: none"> • Biometric Gates (Consideration: Legislation, standardisation of travel documents. Agreement on a common regulatory framework for the wide adoption of the biometric devices). • Additional boarding pass check measures allow distribution of passengers across multiple landside/airside gates (Consideration: Space constraints and spill over from distancing requirements in other parts of the terminal). • Redesign of queues in front of boarding pass check (Consideration: Space constraints and spill over from distancing requirements in other parts of the terminal). • Display Screens to enforce physical distancing measures (Consideration: Location to place the display units, and possibly in multi-lingual options). • Virtual Assistants. • Stanchion (tensa) barriers set at defined physical distances, with a screen for messages. • Computer Vision and Artificial Intelligence applied to monitor areas where it is difficult to ensure physical distancing. Feed from existing CCTV cameras and terminal layout to provide video analysis with a heat map showing where large concentrations of people impact distancing (Consideration: Maturity of the solution; System integration and interfaces with different systems). • IoT sensors used to monitor density information by providing anonymous real-time occupancy data (Consideration: System integration and interfaces with different systems). 	<ul style="list-style-type: none"> • Define new KPIs for the new bottlenecks generated by COVID-19 measures (e.g. maximum passengers per area). • Review allocation processes considering stanchion constraints. • Slow processing time to avoid clusters of passengers.

Implications for People and Premises

Premises: Spill over as a result of stricter physical distancing.

People: Broadcast of information on physical distancing as well as procedures (e.g. what to do when reaching control areas: have boarding pass ready).

Other Considerations (financial – implementation – pros and cons)

- Introduction of automated gate readers to minimise contacts (passenger/staff and staff/passenger) might have implications for the layout and capacity of premises.
- Detailed information on physical distancing measures for queuing processes can be found in the Premises chapter. Installation of Digital Screens at the head of each lane with messages about the procedures ahead.



Munich Airport / MUC

3.3.5 SECURITY CHECKPOINT

Security Checkpoint

Current Issue: To ensure proper distance between the passengers while reducing the queuing time.

Stakeholders: Airport Managing Bodies, security service providers, sub-contractors.

 ACI EUROPE RECOMMENDATIONS	
Operational Measure/Technology	Changes to the Processes
<ul style="list-style-type: none"> Explosive Detection Systems for Cabin Baggage (C2 & C3) (Consideration: Time to upgrade or replace existing x-ray machines and financial implications). Queue Management to ensure physical distancing (Consideration: Operational disruption). Boarding card scanning system to control passenger flow into screening area based on scheduled departure time of the flight (Consideration: Integration of Boarding Card Scanning system and Airport Operation System). Cleaning and disinfection of Security checkpoint based on number of screened passengers and at regular intervals (Consideration: Monitoring of queue length and physical distancing). UVGI Disinfection of the trays after each use (Consideration: Cost of implementation in tray return systems). Security Scanners (Consideration: Cost of replacement of existing Walk Through Metal Detectors (WTMD)/passenger screening units). Display Screens & Virtual Assistants. IoT sensors could also be used to monitor density information by providing anonymous real-time occupancy data (Consideration: System integration and interfaces with different systems). Queue dispensing token uses a mobile app adapted from other service industries. For example, passenger screening: with the mobile app passenger scanning a QR code to get in a queue, then receives a queue number on the mobile, and when ready for the service (e.g. screening) the number is called. This would allow the passenger to wait remotely and within the determined physical distance (Consideration: Impact on the Level of Service for this touchpoint due to the impact of processing time as passengers will be called one at a time, increasing the duration of the process). 	<ul style="list-style-type: none"> Less handling as passengers will not need to take the contents out of their cabin baggage (e.g. laptop and/or liquids) to place them in a tray. Limit the number of passengers accessing Security Screening Area based on time and/or flight. Modify the queue constraints to respect physical distancing. Review the flow of passengers (resource allocation) ensuring constant load balancing across multiple entry points. Entrance in the checkpoint at pre-agreed timing.

Implications for People and Premises

Premises: Application of floor stickers to maintain passenger distance.

People: Close contact of staff and passengers for body searches requires changed processes.

Other Considerations (financial – implementation – pros and cons)

- Passengers may need to present themselves much earlier than before due to lengthier/slower baggage check-in process (However, this results in more passengers being in the terminal at the same time leading to capacity issues and difficulties in ensuring physical distancing).
- Potential to have hand baggage and trays disinfected via sprays or UVGI disinfection.
- Ad hoc tags attached to sanitised hand baggage.
- Hand sanitisers available at the checkpoint for both passengers and staff.
- (If mandated) ensure passengers keep their masks and gloves on and to avoid touching anyone else's items.
- Security considerations as passengers are wearing masks making identification more difficult.
- Constant information about procedures using Display Screens, Virtual Assistants position at entry point of the belt.
- The replacement and upgrading of security screening technology for passengers and cabin baggage may be taken into consideration.³⁷



Budapest Airport / BUD

37. Additional information on recommended security screening processes can be found in the ACI Advisory Bulletin on "Security screening best practices during COVID-19".

3.3.6 BORDER CONTROL

Border Control

Current Issue: Ensuring respect of physical distancing rules, safeguarding the safety of passengers and staff, enforcing the Entry/Exit checks as required by local legislation while optimising the available space and minimising waiting times.

Stakeholders: Airport Managing Bodies, public authorities.

 ACI EUROPE RECOMMENDATIONS	
Operational Measure/Technology	Changes to the Processes
<ul style="list-style-type: none"> For automatic border control, cleaning and disinfection of the passport touchpoint might be needed on a regular basis (Consideration: May require additional people to ensure area is constantly cleaned and sanitised). Increase the number of sanitisers at border control. Travel Information Manual Automatic (TIMATIC): destination specific rules might apply if different countries apply different entry criteria (Consideration: Coordination between national health authorities to ensure consistent information on regulation). Biometrics Gates (Consideration: Legislation, standardisation of travel documents. Agreement on a common regulatory framework for the wide adoption of the biometric devices). Queue dispensing token uses a mobile app adapted from other service industries. For example, passenger screening: with the mobile app passengers scan a QR code to get in a queue, then receives a queue number on the mobile, and when ready for the service (e.g. screening) the number is called. This would allow the passenger to wait remotely (Consideration: Maturity of the solution and logistics to manage flow; Impact on the Level of Service for this touchpoint due to the impact of processing time as passengers will be called one at a time, increasing the duration of the process). Virtual queuing and boarding solution using FIDS or Airport App. Application guided by Ground Handler at gate, which calls passengers either individually or by seating row shown on FIDS or app. 	<ul style="list-style-type: none"> Limit the number of passengers accessing Border Control at the same time and/or the flight parameter. Modify the queue constraints to respect physical distancing. Review the flow of passengers (resource allocation) ensuring constant load balancing across multiple entry points.

Implications for People and Premises

Premises: Separate lines could be required to segregate passengers with different entry criteria.

People: Additional staff required for supervision (or perform) the sanitisation of the passport touchpoint.

Other Considerations (financial – implementation – pros and cons)

- Adoption of contactless devices such as biometrics should come based on a feasibility study balancing the required investment with expected short to longer-term benefits as regards queue management. Key to wide adoption of this technology is the definition of common legislation regarding the standardisation of travel documents.
- Entry/Exit screening may be requested by European states.



Nice Côte d'Azur Airport / NCE

3.3.7 CUSTOMS CONTROL

Customs Control

Current Issue: Ensuring adherence to the physical distancing requirements, safeguarding the safety of the passenger and staff.

Stakeholders: Airport Managing Bodies, public authorities.

ACI EUROPE RECOMMENDATIONS	
Operational Measure/Technology	Changes to the Processes
<ul style="list-style-type: none"> • New infrastructure to protect Customs Agents (Consideration: Operational impact due to premises). • Extra sanitising product available. • Resource Allocation System – load balancing of passengers across multiple Customs control areas. • Use of PPE for staff. • Adoption of floor signage to respect physical distancing (Consideration: Low complexity, possible space constraints). • Additional and more advanced x-ray technologies should be installed and used to reduce manual searches. • Online customs declarations should be possible to reduce paper work at the airport. 	<ul style="list-style-type: none"> • No impact on processes but impact on facilities to ensure cleanliness, sanitisation, and space.

Implications for People and Premises

Premises: New design of infrastructure, more space available to respect minimum distances.

People: Adherence to new practices and compliance requirements.

Other Considerations (financial – implementation – pros and cons)

- No specific considerations.



Madrid-Barajas Adolfo Suárez Airport / MAD

3.3.8 BOARDING (INCLUDING MAXIMUM NUMBER OF PASSENGERS ON AIRSIDE BUSES)

Boarding – Remote Boarding - Deboarding

Current Issue: To ensure physical distancing between passengers while reducing queuing times.

Stakeholders: Airport Managing Bodies, air carriers, ground handlers.

 ACI EUROPE RECOMMENDATIONS	
Operational Measure/Technology	Changes to the Processes
<ul style="list-style-type: none"> • Biometric Gates (Consideration: Legislation, standardisation of travel documents. Agreement on a common regulatory framework for the wide adoption of the biometric devices). • Queue Management to ensure physical distance (Consideration: Enforce respect of physical distancing). • Computer Vision (Consideration: Privacy issues; Integration with Airline system). • Review the design of gate areas allowing more space for lines of boarding passengers. • Prioritise boarding on foot over the use of contact gates and buses, wherever possible, and avoid the use of pre boarding gates, limit pre boarding to a set number of passengers. • Use PA system and digital paging to provide additional information for passengers. • Resource Allocation System (Consideration: Introduce new constraints in the allocation processes to avoid the concurrent use of adjacent gates). • Virtual Boarding: ensure boarding by seat rows, via mobile app and/or digital signage to communicate to passengers the boarding order (Consideration: Requires appropriate signage at boarding gates). • Queue dispensing token uses a mobile app adapted from other service industries. For example, passenger screening: passengers scan a QR code to get in a queue, then receives a queue number on the mobile, and when ready for the service the number is called (Consideration: Maturity of the solution and logistics to manage flow; Impact on the Level of Service for this touchpoint due to the impact of processing time as passengers will be called one at a time, increasing the duration of the process). 	<ul style="list-style-type: none"> • Standardisation of travel documents. • Little or no interface with agents. • Dedicated lanes for special passengers (i.e. Frequent Flyers, PRM, etc.). • Continuous monitoring of the queue. • Use available flow arrows to manage crowds. • Strict handling of Cabin Baggage (i.e. no check-in at gates). • New Boarding processes (e.g. start with people from rows located at the back of the plane towards the front). • Use of buses should account for physical distancing (i.e. more buses). • Sanitisation: buses should be cleaned between each use. If the airline has provided gloves to passengers, announcements should be made on buses to ensure passengers keep their gloves on.

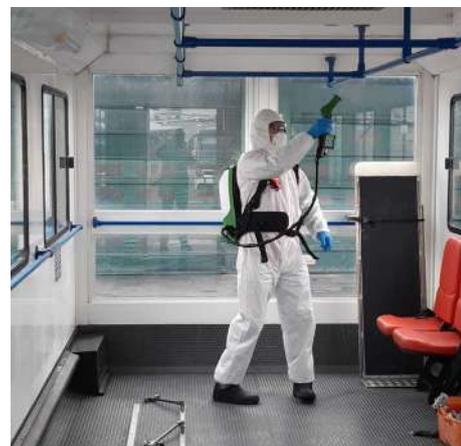
Implications for People and Premises

Premises: Application of floor stickers to maintain passenger distance.

People: To be trained on new boarding procedures and to instruct passengers accordingly.

Other Considerations (financial – implementation – pros and cons)

- Rethinking the boarding procedures will contribute to transmission prevention. Passengers to stay in the waiting area until their row is announced.
- Real capacity must be analysed in each phase based on the new constraints.



Menorca Airport / MAH & Milan Malpensa Airport / MXP

3.3.9 FLIGHT CONNECTIONS

Flight Connections

Current Issue: To ensure adoption of same or equivalent processes as those applied to locally departing passengers – including physical distancing, health, and other requirements.

Stakeholders: Airport Managing Bodies, air carriers, ground handlers, sub-contractors.

ACI EUROPE RECOMMENDATIONS	
Operational Measure/Technology	Changes to the Processes
<ul style="list-style-type: none">• Avoid more passenger traffic than necessary in connections by reviewing gate allocation management. Boarding gates for arrival, departure and connecting flights must be as close as possible. This also makes operations more efficient for airlines (Consideration: Automation of this rule).• Review connecting times based on new processes and consider the modification of Minimum Connecting Times (MCT).	<ul style="list-style-type: none">• Efficiency in allocation management of boarding gates.• Longer MCT to account for extended (longer) processing time.• Process changes at transfer checkpoints similar to chapters 3.3.5 Security Checkpoints and 3.3.6 Border Control• Consider processes for exemption of certain transfer passengers from imposed entry/exit screening measures.

Implications for People and Premises

Premises: There is a major constraint at transfer hubs to accommodate new processes in transfer areas.

People: Airport Managing Bodies, air carriers, ground handlers, sub-contractors.

Other Considerations (financial – implementation – pros and cons)

- Determine which measures are temporary and which ones are permanent to understand financial implications.



London City Airport / LCY

3.3.10 BAGGAGE

The Baggage Journey

Current Issue: Baggage and baggage trolleys can be vectors for COVID-19. Baggage drop-off and collection areas are crowded spaces that may facilitate COVID-19 transmission.

Stakeholders: Airport Managing Bodies, air carriers, ground handlers.

 ACI EUROPE RECOMMENDATIONS	
Operational Measure/Technology	Changes to the Processes
<ul style="list-style-type: none"> IoT tagging of trolleys enabling them to be located and to identify trolleys that need to be sanitised (Consideration: IoT tagging trolleys is an existing technology already in place at some airports). UVGI (Ultraviolet germicidal irradiation) disinfection tunnels for sanitisation of trolleys (Consideration: UV-C lighting technology is relatively simple (locally built) but the space constrained implications can be considerable. Medium complexity). In-line UVGI disinfection tunnels: (1) at the end of the baggage collection belt before entering the BHS for hold-baggage; (2) pre-security screening. Bag tag printing at check-in or dedicated kiosks (Consideration: Bag tag printing at check-in or dedicated kiosks is an existing technology but might require additional kiosks, existing kiosk retrofit and airline application integration). Manage flight allocation on baggage delivery belts in the make-up area in such a way that handlers can keep physical distancing. Avoid the simultaneous use of adjacent baggage delivery belts in the reclaim hall and prioritise the use of larger belts as they have a longer presentation length. Send a message to the passenger's mobile device when the bag is actually on the carousel to avoid loitering in a crowded area. Facilitate the use of baggage delivery services to the passenger's home or hotel address. 	<ul style="list-style-type: none"> Physical distancing enforced at baggage drop-off locations and at baggage collection carousels. Inform passengers of reclaim belt numbers before disembarking from the aircraft, and whenever possible require passengers to stay in their seats until called forward to collect bags (in coordination with the airlines). Use available flow arrows to manage crowds. Allow only one person per group to approach the reclaim belt to collect bags, whenever possible. Self-service bag tag printing preventing agents having to touch the bag upon acceptance. Sanitisation of bags before entering the BHS. Agent self-sanitisation when handling bags. Sanitisation of baggage trolleys at collection.

Implications for People and Premises

Premises:

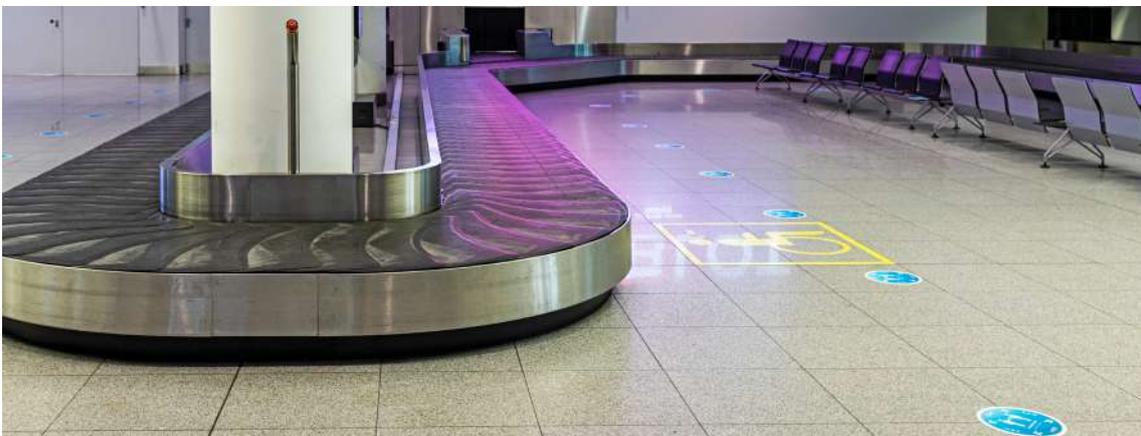
- Trolleys: fence off baggage trolley areas to prevent occasional contamination with clear signage of where to collect trolleys.
- Bag tag printing kiosks: require space, albeit a smaller footprint than a standard check-in kiosk, which must be correctly positioned according to the passenger flow.
- Bag sanitation: space at bag-drop station for sanitation/cleaning equipment.
- UVGI lighting tunnels:
 - 1) Placed over end of baggage collection belt.
 - 2) Placed before security inspection requires additional space.
 - 3) Mobile units placed close to trolley collection and dispatch locations.

People:

- Trolleys: trolley collecting staff to be equipped with sanitisation equipment. Agents accepting baggage at bag-drop should be protected from person-to-person contamination and from bag to agent contamination.
- Physical distancing: floorwalkers facilitating physical distancing at baggage drop-of (queues) and baggage carousels.

Other Considerations (financial – implementation – pros and cons)

- There is a cost implication in using UVGI disinfection, but they are effective and easy to implement.
- Self Service Bag-tag printing for the purpose of mitigating the current crisis will pay-off in massively increased efficiency in passenger departure handling when air travel returns to normal. Implementing an enforced process now can also provide a major opportunity to educate passengers for the future. The current implementation costs can therefore be offset by future process savings.
- In-line UVGI sanitisation tunnels at the end of the collection belt (before entering the BHS) is preferable to agents sanitising bags at their station. However, touchless baggage acceptance by agents cannot always be guaranteed. Agents therefore require all the prescribed sanitisation tools to protect themselves.
- Real capacity must be analysed in each phase based on any new constraints.



Munich Airport / MUC

3.3.11 GROUND HANDLING (INCLUDING MINIMUM CONNECTING TIME (MCT) AND TURNAROUND TIME)

Ground Handling

Current Issue: Ground handling, as a crucial element of airport operations, requires a set of specific measures to both ensure operational continuity and to protect the well-being of ground handlers' staff and passengers. Ground handling activities are transversal within the airport system and involve several and often continued interactions between passengers, baggage, staff and a wide range of airport facilities and equipment as well as aircraft.

Stakeholders: Airport Managing Bodies, air carriers, ground handlers.

ACI EUROPE RECOMMENDATIONS	
Operational Measure/Technology	Changes to the Processes
<ul style="list-style-type: none"> • Cleaning, disinfection, and ventilation of transfer buses (Consideration: increased turnaround times and extended MCTs). • Disinfection of aircraft interiors. • Baggage acceptance gaps should be wider than usual so that the bags are offloaded and well separated onto the belts. This could be done automatically by reprogramming the belts (Consideration: this would mean that the total offload time would increase, and handlers might not meet their SLAs agreed with airlines). • Use local PA system to inform passengers of new boarding process due to the special measures in place. 	<ul style="list-style-type: none"> • Sequencing of different turnaround activities in order to ensure physical distances between ground handler agents and other members of staff. • Segregate staff flows inside the aircraft to ensure physical distancing. • Limit the number of people per bus as required by physical distancing (both for departures and arrivals).

Implications for People and Premises

Premises:

- Belts will not operate to their full capacity and turnaround times will increase based on new processes.
- Provide floor stickers to guarantee physical distancing between passengers (also inside the buses).

People: Ground handling staff to be provided with masks and protective gloves.

Other Considerations (financial – implementation – pros and cons)

- Estimate new turnaround times based on new processes and consider adjusting MCTs.
- Analyse impact of measures on resource allocation (i.e. limiting the number of people per bus will result in a higher requirement for bus rotation).

3.3.12 AIRSIDE OPERATIONS

Airside Operations

Current Issue: Maintain the effective separation of flows and physical distancing between passengers and employees during airside operations.

Stakeholders: Airport Managing Bodies, air carriers, ground handlers.

 ACI EUROPE RECOMMENDATIONS	
Operational Measure/Technology	Changes to the Processes
<ul style="list-style-type: none"> Where possible, the walk-in walk-out boarding and method of disembarking should be extended with the addition of new stands, including temporary stands, by revising the configuration of the apron and related markings. Airside areas available for use must be clearly defined through the effective use of markings and/or barriers. Non-usable areas must be physically inaccessible, yet efficiently maintained for prompt re-use when necessary (i.e. flooring, markings, AVL systems). Identification of the available areas must be assessed based on the following: <ul style="list-style-type: none"> airport capacity. any limitations/closures of parts of the airport. the possibility of using stands according to procedures and/or restrictions on boarding/disembarking passengers. the possibility of using stands for cargo activities. the need, in agreement with relevant airline companies, to dedicate apron spaces for parking non-operational aircraft. Airside areas vehicle routes must be clearly defined with clear connections to functional areas and operational stands. This is to both optimise any infrastructure sanitation procedures and to avoid any personnel movements in non-operational areas. To reduce the ground handlers' routes, it will be possible to evaluate the use of new areas dedicated to parking vehicles. Considering procedures for accessing airside areas, the number of access gates must be limited to only those that are indispensable, those gates not considered essential should be temporarily closed. 	<ul style="list-style-type: none"> The use of stands located near the passenger terminal must be honoured, with both pier connections and walk-in, walk-out procedures. To manage any aircraft with passengers on-board showing suspicious symptoms, isolated stands must be clearly identified to effectively manage this emergency in compliance with current procedures and available spaces.

Implications for People and Premises

Premises:

- Revision of apron configuration and related markings.
- Placement of markings and/or barriers for clearly defining usable and non-usable areas for segregation.
- Clear definition of vehicle routes.
- Establishing new areas dedicated to parking vehicles.

People:

- To be trained to manage aircraft with passengers on-board showing suspicious symptoms in isolated stands.
- To be trained on new procedures relating to non-usable areas.
- To be trained on new procedures relating to new vehicle routes and parking areas.

Other Considerations (financial – implementation – pros and cons)

- No specific considerations.



Budapest Airport / BUD

3.3.13 CONSTRUCTION SITES

Airport Managing Bodies should promptly review, with respect to applicable health and sanitary measures, existing construction sites and projects in progress, as well as construction projects scheduled for the near future. With regard to inconsistencies between on-going or planned projects with these measures, adequate studies must be carried out for their adaptation to ensure they are compliant with measures across the airport.

3.4 UNDERLYING TECHNOLOGY AND INNOVATION

New technologies may contribute to ensuring a healthy passenger experience. The passenger journey in a post-COVID-19 world will ensure enhanced safety for passengers and thus needs to become increasingly seamless - eliminating queues, bottlenecks, crowded areas, and crossflows. The following chapters outline these technologies.



GOALS FOR A HEALTHY PASSENGER EXPERIENCE – Processes

Use technologies and innovation throughout the passenger journey to...

- Support health-related measures and make them more effective and efficient.
- Enhance the passenger experience through individual, personalised information and interactions.
- Create contactless processes.
- Minimise disruptions (e.g. process and waiting times) and facilitate physical distancing.
- Support operations management in achieving a seamless passenger journey.



EASA/ECDC RECOMMENDATIONS³⁸

- Where possible, contact with and touching of surfaces should be minimised by encouraging/requesting the use of alternative electronic processes or means (e.g. mobile check-in, non-contact boarding).
- It is recommended that the national governments should also simplify border control formalities by enabling contactless processes (e.g. relating to the reading of passport chips, facial recognition, etc.) or passenger flow management with digital solutions.

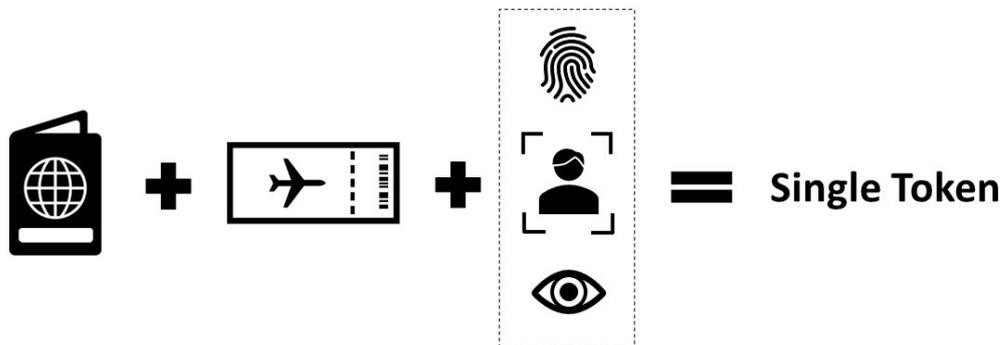
³⁸. EASA/ECDC COVID-19 Aviation Health Safety Protocol - Operational Guidelines for the management of air passengers and aviation personnel in relation to the COVID-19 pandemic (version 2.0).

3.4.1 BIOMETRICS: TOWARDS A CONTACTLESS PASSENGER JOURNEY

Biometric technology provides the opportunity to transform the passenger journey and address many of the concerns of the health-concerned passenger. It has the potential to deliver a healthier passenger experience across the passenger journey by reducing the need for physical interactions with staff and equipment. Once a passenger provides consent, a biometric single token ID is issued.



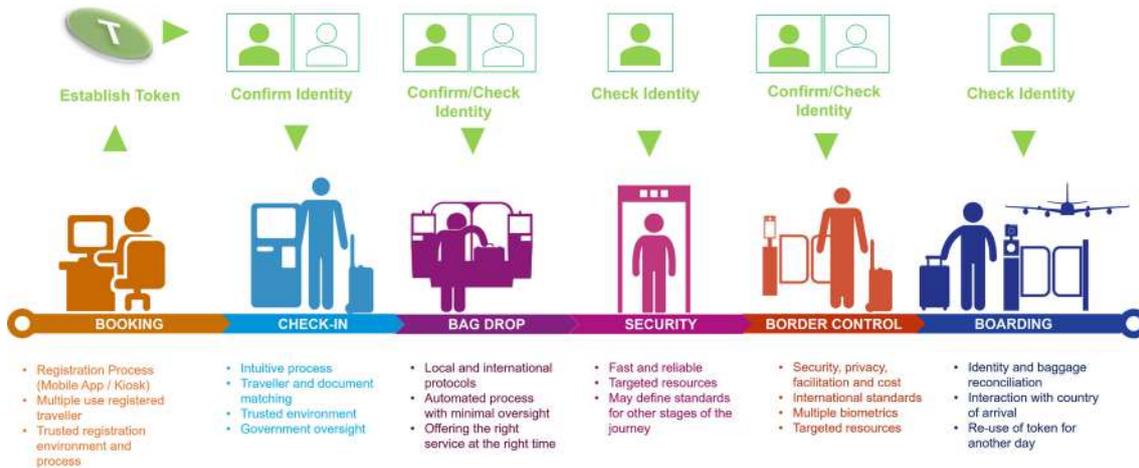
PICTURE 8 – SINGLE TOKEN TRAVEL AND DIGITAL BIOMETRICS



This ID then allows passengers to proceed through various airport touchpoints hassle-free using a predefined biometric feature (facial, iris, fingerprint recognition, etc.), instead of having to present their passport or ID document and boarding pass at every checkpoint. The platform, which stores the passenger’s digital record, is developed according to the “privacy-by-design” principle. At each airport step only the stakeholder who needs to see the information to handle the passenger will have access to it, be it the air carrier, the airport, or a government agency. Passengers can thus be recognised and served in the most efficient manner, while privacy is entirely respected. The passenger journey and the biometric touchpoints are shown in Picture 9, starting from the creation of a token at the time of booking through to boarding the plane. A token can also be created at the airport using self-service biometric kiosks.



PICTURE 9 – BIOMETRIC AIRPORT JOURNEY



Source: SITA

The following touchpoints should be considered when considering biometric solutions:

- **Booking** – to create a biometric single token before arriving at the airport.
- **Check-In** – as an alternative to create a biometric single token if not possible before (check-in desks or kiosks need to be upgraded with cameras).
- **Bag Drop** – including the possibility to print and attach bag tag before linking the bag to the passengers ID.
- **Security Control** – to allow access through e-gates without presenting the boarding pass.
- **Border Control** – through the use of digital identities in which biometric data is stored, with personal information shared with border control authorities to expedite the process.³⁶
- **Boarding** – to allow boarding through e-gates without presenting the boarding pass.

Other touchpoints at airports at which biometric technology can be used:

- Lounges: using e-gates to identify passengers who have authorisation to access.
- Biometric payments: at shops, restaurants, parking, etc.

Challenges

While biometrics is a proven technology that has been in use at airports for many years (mainly to address specific touchpoints along the passenger journey, e.g. Border Control), it is rarely used at European airports to cover multiple touchpoints. Biometric technology provides many opportunities, but it also comes with challenges that must be addressed so that a truly seamless and touchless journey can be ensured for the passenger.

Some of these challenges are discussed below:

Standardisation:

While there are many suppliers providing biometric solutions, there needs to be one single universal Biometric ID that is accepted at all touchpoints and by all stakeholders (Member states, carriers, and Airport Managing Bodies). Airports recommend that the implementation of technologies for biometrics be done with common use technologies, i.e. that all devices installed be interoperable across a multitude of airlines and other partners' systems. It is also recommended that the pre-existing airport infrastructure be used by stakeholders for the implementation of biometric systems.³⁹

There is a need for a common, integrated passenger biometrics database at the European (or even Global) level so that it can be used seamlessly by different airlines and airports. IATA One ID⁴⁰ is an industry-wide initiative that is using a trusted digital identity, biometric recognition technology and a collaborative identity management platform.

- Standard biometrics
 - Facial: Facial is the most commonly used touchless device but there are possible difficulties if face masks are introduced as part of travel post-COVID-19. In order to avoid having to remove facial coverings at each scanning device, biometric vendors are testing modified algorithms of the face map points. However, it will be some time before this can be approved by all competent authorities.
 - Iris: Touchless, addresses facial mask issues but not as commonly used as facial.
 - Fingerprint: Not a touchless technology and may be resisted post-COVID-19.

Additional challenges are listed below:

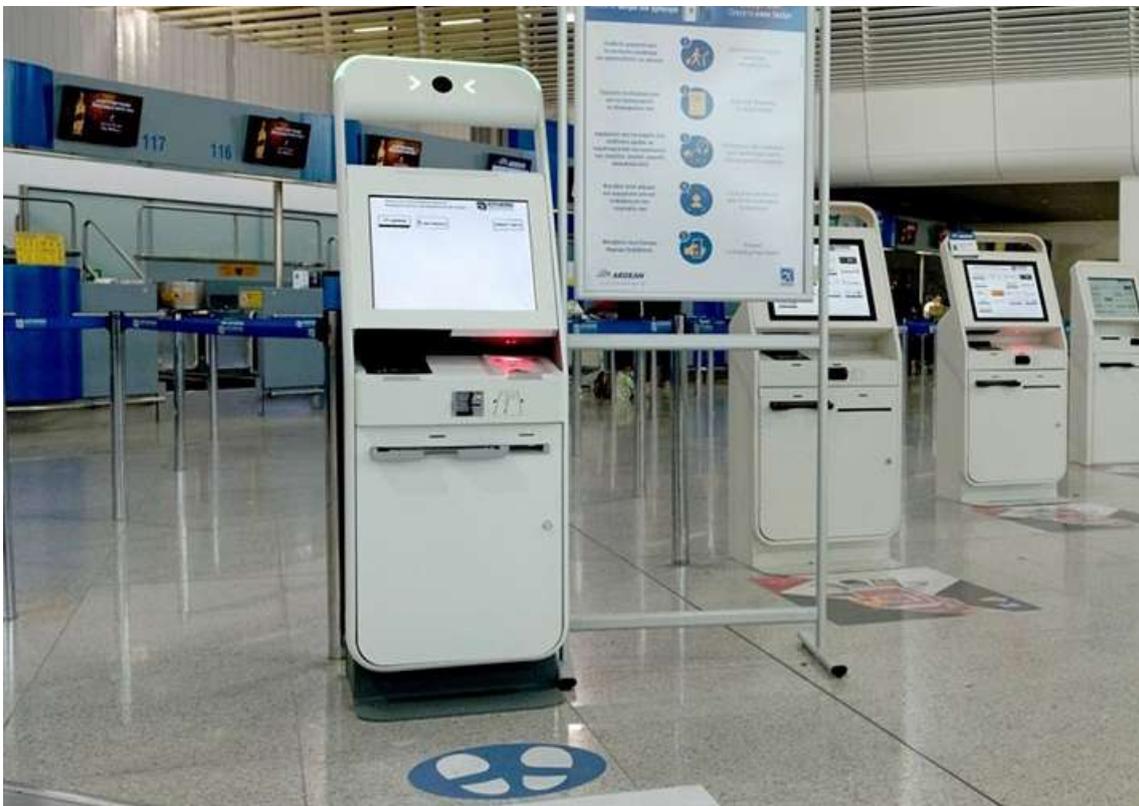
- General Data Protection Regulation (GDPR)
 - Privacy By Design - any action a company undertakes that involves processing personal data must be done with data protection and privacy in mind at every step.
 - Each stakeholder only can access the information they need for the sole purpose of processing the passenger.
 - Biometric data is *"personal data resulting from specific technical processing relating to the physical, physiological, or behavioural characteristics of a natural person, which allows or confirms the unique identification of that natural person, such as facial images or fingerprints) data."*⁴¹ EU Regulation protects citizens and long-term residents from having their information shared with third parties without their consent.

39. ACI WORLD, *The Application of Biometrics at Airports*, November 2005. [Internet]. Available: <http://www.aci.aero/Media/aci/file/Free%20docs/ACI%20Biometric%20Position%20FINAL.pdf>.

40. IATA, IATA One ID Fact Sheet, December 2019. [Internet]. Available: <https://www.iata.org/en/iata-repository/pressroom/fact-sheets/fact-sheet---one-id/>

41. Gemalto.com, *Biometric data and data protection regulations (GDPR and CCPA)*, 27 February 2020. [Internet]. Available: <https://www.gemalto.com/govt/biometrics/biometric-data>

- Registration
 - Post COVID-19 every effort must be made to ensure that registration is completed before the passenger arrives at the airport, including consent, on mobile devices.
 - Registration could include latest available information on passenger health/passport immunity, etc.
 - Madrid Barajas-Adolfo Suárez Airport is collaborating with Iberia on a biometric project that allows passengers to register in a biometric programme from home using the airport or airline mobile app to create the biometric single token. When passengers arrive at the airport, they can access security control and board the plane directly using biometrics, without having to show identity documents or boarding passes (for domestic and EU Schengen flights).
 - There is also the option of making the biometric registration in specific dedicated registration kiosks at the airport. This is currently done at Menorca Airport with Air Europa and in Madrid Barajas-Adolfo Suárez Airport with Iberia.
- Cost/Funding
 - If biometrics will be applied for all processes including border control, public funding will be necessary.



Athens International Airport / ATH

3.4.2 CONTACT TRACING APPS

Identification of probable or confirmed COVID-19 cases as well as potential secondary cases is critical to prevent and treat further infections. This can be achieved through contact tracing schemes, so as to substantially reduce the likelihood of further transmission.

Technology can play a key role in monitoring and reducing transmission through the use of mobile devices to scale and automatise notifications (e.g. accurate information about COVID-19) as well as increase the speed in which urgent information can be disseminated.

Technology companies are developing solutions based on Application Programming Interfaces (APIs) and operating system-level technology to assist in enabling contact tracing, while maintaining strong protections around user privacy as the user downloads the apps via their respective app stores.

Technology companies have also developed applications for contact tracing purposes, for example:

- Pan-European Privacy-Preserving Proximity Tracing (PEPP-PT)⁴² – provides ready-to-use, well-tested, and properly assessed mechanisms and standards, as well as support for interoperability, outreach, and operation when needed with well-tested and established procedures for proximity measurement on popular mobile operating systems and devices.
- Google/Apple: Open source applications (available in Google/Apps store) and Long Range or Bluetooth-based contact tracing applications can leverage individual devices and integrate with Airport systems. Official Public Health applications are and/or will be available for users to download via their respective app stores (Android/iOS). In the coming months it is likely that Apple and Google will collaborate to enable a broader Bluetooth-based contact tracing platform that might simplify usage from all users.

The European Union has published strict guidelines on data protection for mobile contact tracing apps as well as the general principles on technical specifications on interoperability. This coordinated approach ensures compliance with EU rules regarding security, privacy, and data protection of privacy-compliant tracing apps.

42. <https://www.pepp-pt.org/>

3.4.3 ARTIFICIAL INTELLIGENCE (AI)

Artificial intelligence and the use of algorithms offer the possibility to increase passenger confidence by giving the right information to every passenger at the right moment, based on location, time before flight, profile, and preferences:

- Adapting the wayfinding path to the specific airline lounge or gate according to the traveller's frequent flyer membership status, taking into consideration any disabilities, luggage (number of bags, oversized, etc.), and incorporate it into any digital communications.
- AI will help to target commercial offers based on their location in the airport, time remaining before boarding, time of the day, purchase history, social network interests.
- Computer Vision: combined with AI, this will allow the monitoring of areas where it is difficult to maintain physical distancing (e.g. passenger screening areas or bag claim/carousel areas). The solution could use a feed from existing Closed-Circuit Television (CCTV) cameras and the infrastructure layout to provide video analysis with a heat map showing where people are getting closer to the recommended physical distance.

There are many vendors that can offer AI tools, but relevant stakeholders who are thinking of adopting such technology should consider a solution that will guarantee data anonymisation. AI will allow governments to track passenger movements but must do so while radically reducing the risk of personal data infringement ensuring that the gathered personal data will only be used to track the spread of COVID-19 in full respect of the European Union's GDPR or other applicable legislation.

AI could be used by all relevant stakeholders in the air transport eco-system to share real time information needed to fight against any virus. By applying AI features such as natural language processing, computer vision and machine learning to the mega data that the airports/airlines can have access to, airports will be in a better position to understand what might lead to congestion or safety risks, react in the event of a problem, send alerts and/or predict where hot spots might occur, i.e. identify the most critical routes, high risk inbound flights, etc.

Airport Examples

- AI can be used in airport operations planning, predictive analytics, pattern recognition, automatic scheduling (maintenance/repairs). For example:
 - Hong Kong International Airport (HKG) uses AI to analyse video data from CCTV images to maintain the supply of trolleys for passengers at various locations. This can reduce manual checking of trolley locations and enable long-term resource planning via data-oriented and big data analysis.
 - Incheon International Airport in Seoul (ICN) tested an AI based identification system in their cabin baggage X-ray machines to reduce human error and strengthen the security level for 6 months from September 2019.
 - London Heathrow (LHR) collaborated with NATS (National Air Traffic Control Services) in 2019 to test how AI could help air traffic and airport management by reducing weather related flight delays.

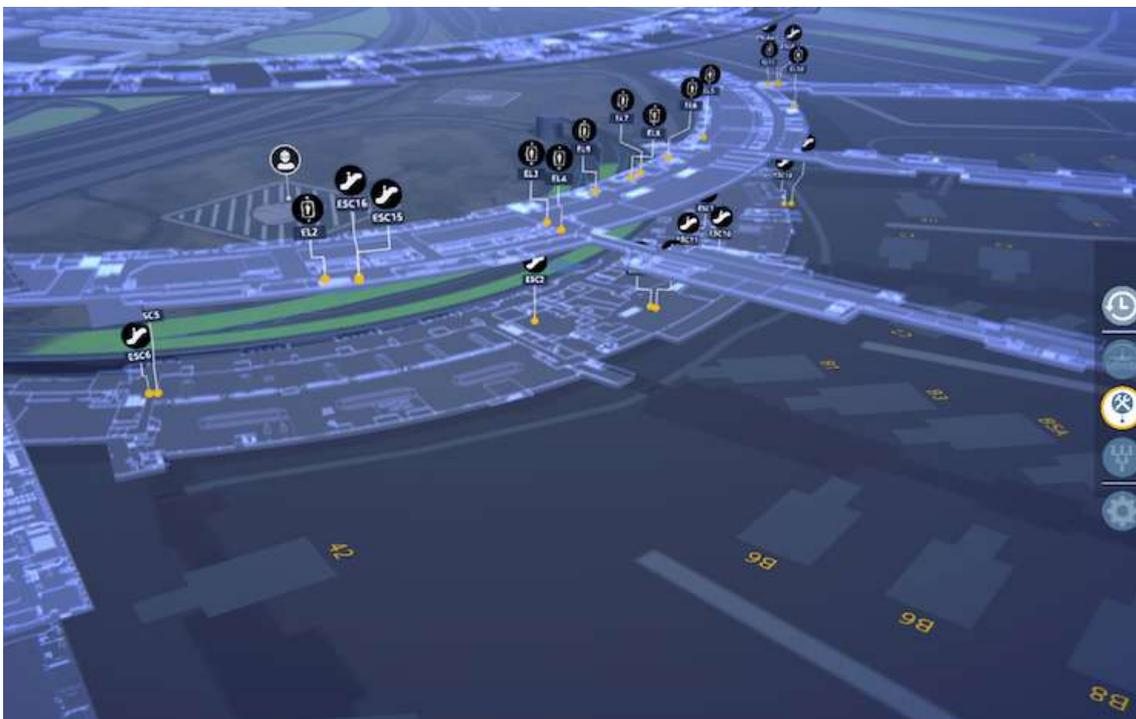
- Application of robotics in airport operations and passenger processing (e.g. check-in robots in Haneda Airport (HND), Kansai International Airport (KIX) and Glasgow Airport (GLA)); car parking robots (in Lyon-Saint Exupéry Airport (LYS), Paris-Charles de Gaulle Airport (CDG) and London Gatwick Airport (LGW)), and baggage carrying between self-bag drop machine to the baggage belt (in Dallas/Fort Worth International Airport (DFW) and Rotterdam The Hague Airport (RTM)).
- Virtual assistants with holography technology, e.g. London Heathrow Airport (LHR) and Josep Tarradellas Barcelona-El Prat Airport (BCN) used to engage passengers with consistent and clear communications at all passenger touchpoints.

3.4.4 DIGITAL TWIN

Defined as “the virtual replica of a physical asset”, a Digital Twin is used to provide a virtual representation of an airport, as well as all related infrastructures. It displays operational data in real-time along with historic and predictive views and as an immersive 3D interface, the data can be easily displayed and explored in a 3D model, as shown below.



PICTURE 10 – AIRPORT DIGITAL TWIN - VIRTUAL REPLICAF OF AN AIRPORT



Source: SITA

A “Digital Twin” will help contribute to the overall passenger experience by enabling the airport to actively monitor key areas of the passenger journey, such as security, service quality of restrooms, etc.

Pivotal for the restoration of passenger confidence to travel will be to provide a seamless passenger journey. This can only be achieved through real time information sharing between airports and airlines. A well-coordinated sharing of AI, Business Intelligence (BI) and dashboard information with all stakeholders will keep everyone, including the passengers, well informed. This can help to combat epidemics while ensuring a touchless journey. Digital Twin technology can streamline the acquisition and comprehension of available information through a simplified user-friendly interactive interface.

The following are some applicable uses for the airport:

- Inbound Flight: create a model to estimate the number of passengers arriving within a specific time frame and the related impact on airport operations and services.
- Infrastructure View: track status of key facilities (e.g. escalators, elevators, restrooms) whether operational or not, and simulate the impact of arriving passengers. Display feedback (service quality) especially from restrooms and security checkpoints.
- Quality View: track metrics at the airport and trigger visible and audible alerts if defined metrics are exceeded. For example:
 - Customer satisfaction responses.
 - Waiting times.
 - Flight delays.
 - Stand allocation conflicts.
- Simulation: run different scenarios such as delays, congestion of forecourt to determine the impact on operations and customer satisfaction with the ability to visualise the data.

3.4.5 WEB/MOBILE APPLICATIONS

Web/Mobile applications may become even more important to ensure passenger confidence over a healthy and safe journey by allowing them to identify those areas within the terminal which are less condensed (and thus ensure social distancing). At the same time, they also allow Airport Managing Bodies to provide valuable personalised information to passengers while enhancing revenues from services like parking, Fast Track, lounges, e-Shopping, etc.

Proximity and push marketing coupled with Video Analytics and AI offer potential for boosting non-aeronautical activities.

3.4.6 WEARABLE DEVICES

The need to maintain physical distancing is one of the critical elements to reduce virus transmission. Wearable devices, such as Smart Watches, could help Airport Managing Bodies and other stakeholders monitoring their staff during working hours to ensure that they respect the recommended safety distance as required by national legislation. Additionally, a wearable device

could anonymously trace someone who has become infected and has interactions with others. These devices can emit a vibration or sound notification to alert staff/passengers of the presence of another device within the recommended range to ensure proper physical distancing. They use low-power Bluetooth to communicate with each-other and might also retain a log of which other devices they have been in contact with, thus providing staff tracing capabilities in case of positive coronavirus case diagnoses - with or without location tracking for privacy purposes.

3.4.7 CONTACTLESS TOUCH PANELS

Touchless control panels could become the new standard to reduce the risk of cross-infections, as the buttons and/or screens can be vectors of infection. Any device in the airport that requires physically touching, such as kiosks, elevators, check-in counter keyboards, might be upgraded/replaced with a virtual touchpad. One solution could be a holographic technology based on the transformation of light into a real image through light field reconstruction. Other solutions might include smartphone via Bluetooth or QR-code registration, hand motion, and laser technologies. All of these will allow real hands-free interactions with the devices.

3.4.8 PASSENGER TRACKING AND ALERTS

It would be useful to monitor passengers (subject to their prior consent), using a mobile application or active/passive location devices (Radio-frequency identification (RFID)/Beacons) installed at the access points to the terminal. This would allow to monitor the respect of social distancing. The ways in which such monitoring of passengers can be done include:

- Mobile application: no need for any physical device other than a mobile phone.
- Tag: this is the most used format for the identification and location of people, since it can be an identification card or installed in clothing.
- Bracelet: alternative Tag Beacon format worn on the wrist, with the same identification and location features as the tag format.
- Beacons for the identification of Beacon Tags, with an effective range of up to 80m.

Beacons communicate with antennas installed at key locations to cover the entire terminal area. The person in charge of the monitoring can see on his/her device a 'heat map' showing the accumulation/density of people.

Moreover, this technology allows to engineer and release alerts to detect and warn of excess passenger density and non-respect of physical distancing.

There are systems based on sensor integration and algorithm adaptation, which build heat maps that visualise real density and compare it with theoretical density to facilitate appropriate mitigating and corrective measures to redirect the flow of people, open new control checkpoints, etc.

Generation of non-compliance alerts: the person in charge of monitoring receives real-time notifications of non-compliance events, so that it allows him/her to identify passengers who do not comply with relevant protocols and then consider corrective measures.

3.4.9 PASSENGER COUNTING OR PASSENGER FLOW MONITORING (PFM)

Ensuring physical distancing will be a considerable challenge for the Airport Managing Bodies. Therefore, monitoring passengers flows in real time will assist in ensuring a safer and seamless passenger experience and optimal airport performance. Passenger Counting or Passenger Flow Monitoring (PFM) solutions should enable the Airport Managing Body to obtain data such as passenger density, and to proactively prevent and manage crowding of passengers at specific touchpoints. Counting solutions can also be implemented to limit the number of persons in restrooms, lounges, shops, etc. where entry and exit occurs through dedicated doors, gates, or corridors. If a space contains the maximum number of persons allowed, further access can then be denied (e.g. red light or swing door).

There is considerable data generated by independent systems at the airport, which typically tends to be underutilised (e.g. data available from BCBP print/scan events, at check-in, security, and boarding). Such data can provide useful information such as number of passengers at a touchpoint, location of passengers and others. Integrating data from other systems and new technologies can assist airports in monitoring passenger flows across their premises and acquire end-to-end situational awareness.

A PFM solution should provide the following features or capabilities:

- Live map visualisations of passenger movements, queue formation and density cloud.
- Embedded with Business Intelligence historical reporting.
- Ability to use different devices (e.g. desktops and mobile) with configurable alerts.
- Ability to deploy a mobile checkpoint:
 - Pre-entrance checkpoint at entrance or terminal building to control access and flow.
 - Deploy extra checkpoint at any location at the airport in response to unforeseen occurrences.

An example of new technology is Computer Vision. This technology can also help enforcing physical distancing by facilitating more than just passenger counting and queue management. Artificial Intelligence algorithms can analyse feeds from existing IP CCTV cameras to provide real-time data on the number of people in a given area and on whether safe distances are maintained between them. Therefore, through Computer Vision technology Airport Managing Bodies may leverage detection capabilities to enable multiple operational use and automated workflows. These include the number of people in a facility or public space, whether they respect physical distancing, when and where cleaning staff should clean based on the surfaces people have been using, the number of people passing through a scene that are wearing masks, counting of the hand luggage at boarding area or identify unattended bags and raise an alarm, calculate the required number of security lanes to open versus passenger influx, etc. All the above can contribute to create a frictionless travel experience for the passengers while allowing airports to better understand and quantitatively track operational processes involving passengers in real time.

Combining the location of the passenger with the location of baggage will enable physical distancing in the arrival baggage claim areas through a baggage journey tracking solution that notifies the passenger when their bag is on the belt by pushing the information to a Flight Information Display screen or direct to the airport app, thus avoiding passengers crowding at the baggage belt.

3.4.10 PASSENGER DYNAMIC SIMULATIONS

To guarantee fluid processes, avoid gatherings and bottlenecks, as well as improve the overall safety conditions for passengers and operators, verifications are recommended using specialised dynamic simulation software. Aimed at going beyond the existing physical distancing measures within the airport premises, the dynamic simulations can be applied to new operating models. Modelling scenarios will allow airports and operators to measure the effective capacity of functional areas, specifically in relation to future COVID-19 measures, and where appropriate, to support the provision of new ways of managing spaces and routes. In particular, the areas will concern:

- Terminal entrance area, both landside and airside: in relation to specific solutions put in place by each airport to guarantee the pre-screening/registration of passengers during departure and arrival; the internal and external spaces available for passengers queuing, waiting times, etc.; as well as determining the impact of queuing arrangements on the curb or aircraft apron areas.
- Landside areas: Departure Hall, Check-in acceptance, Security, and Arrival Hall.
- Airside areas: Gate areas and Departure Lounges, Passport Control, and Baggage Claim.

The simulations should support and verify solutions for the reconfiguration and preparation of spaces and routes that ensure the maximum possible spacing between passengers and employees, as well as the efficient management of flows, to protect passengers and employees, supporting the new passenger healthy experience.

3.4.11 SMART RESTROOM TECHNOLOGY

The smart restroom is a solution that integrates IoT environmental and operational sensors with digital 3D mapping to provide intuitive user dashboards and alarms for real time decision making.

These systems normally provide a live view of geo-specific data across all restroom facilities. Using IoT technology can monitor and report on a wide range of items such as temperature, humidity, air quality, occupancy levels, water flow, soap dispenser levels, etc. - dispatching information to staff for pro-active engagement whenever needed to respect social distancing and/or the minimum required quality SLAs.

Real-time data can also be assessed with a historical overview to understand longer-term usage patterns and predict how consumables are used within the restroom – thus allowing for improved customer satisfaction, operational efficiency, and cost efficiencies.

3.5 PRM ASSISTANCE⁴³

Travelling safely is a right for all passengers, including persons with disabilities and/or reduced mobility (PRMs), which is safeguarded by Regulation (EC) 1107/2006. The Regulation ensures PRMs' right to assistance and imposing physical distancing must not jeopardise this right.

43. In cooperation with the European Disability Forum (EDF). Please also see EDF recommendation on exit measure for transport services in light of COVID-19: [EDF Recommendations on transport exit measures in light of covid-19](#)



GOALS FOR A HEALTHY PASSENGER EXPERIENCE

Implementing measures and changed processes for PRM assistance to...

- Protect PRM assistance staff and PRMs from COVID-19 transmission.
- Provide confidence to PRMs that the journey through the airport is safe for them.
- Ensure health safety notwithstanding the impossibility of ensuring physical distancing in various situations.

PRM assistance implies close physical contact with the passenger and many PRMs may be more vulnerable to COVID-19 (and other infectious diseases). Passengers requesting assistance with the codes Wheelchair-Ramp (WCHR) or Wheelchair-Steps (WCHS) are considered the highest risk group for PRM assistance providers. The only information service providers have is that the PRM is not able to walk long distances or climb stairs, so they can miss out on vital health-related information to ensure the passenger is adequately protected from infection risks.

Infected asymptomatic PRMs or assistance providers may pose an even greater health risk to each other during assistance provision since the very nature of the assistance makes it impossible to ensure 1.5m physical distancing.

PRMs using a wheelchair can be in even more vulnerable position since falling droplets can more easily reach their face when they come too close to other people.



Copenhagen Airport / CPH



ACI EUROPE RECOMMENDATIONS – Special Protection for PRM Assistance (PA) Staff

- For PA staff attention should be paid to the following points⁴⁴:
 - Given close contact with PRMs, PA staff should wear personal protective equipment (PPE) at all time, as do health workers.
 - Hands should be disinfected before wearing (PPE).
 - Hands should be washed with soap and water or hydro-alcoholic gel after contact with PRMs.
 - Protective masks should be changed every 4 hours.
 - Caps should fully cover all hair, including shock hair on the hairline.
 - Long hair should be fastened tightly on top the head and put into the cap, and the edges of caps should fit close to the sides of ears.
 - Protective equipment needs to be replaced immediately when exposed to passenger's blood, vomit, and other potentially contagious body fluids.
 - Reusable goggles should be promptly sterilised and dried after each use.
 - Hands should not touch faces when taking off protective equipment.
 - The removed disposable protective equipment (gloves, face masks, etc.) should be put into medical waste bags.
- During the whole PRM assistance process, PA staff should wear disposable gloves.
- PA staff should wear a highly protective face mask in the public zone of the airport, preferably FFP 2 or FFP 3 types. PA staff must be aware that using masks may block the possibility to lip-read for deaf and hard of hearing (HoH) persons who rely on lip-reading for communication.
- PA staff should wear eye protection (goggles) during handling activities with PRMs, especially when in close physical contact with PRMs, like during lifting and other physical assistance.
- When lifting a Wheelchair – Carry (WCHC), PA staff should wear the PPE mentioned above plus a disposable protecting suit/coverall. After lifting and (de)boarding the WCHC, the coverall and gloves must be disposed of in a medical waste bin and wash the hands.

Please note: The special protection and the Special Operational Procedures will generate additional work for PA staff, but health and safety issues should have priority.

44. ACI Advisory Bulletin, *Security screening best practices during COVID-19, 03/2020.*



ACI EUROPE RECOMMENDATIONS – Special Operational Procedures

- Handover procedures between PA staff members should be avoided as much as possible, so that the same PA staff member takes care of the passenger during the whole assistance process. However, if not possible, all equipment (equipment of the passenger included) used by the first PA staff member should be cleaned before another PA staff member takes over.
- The use of an ambulift is also recommended for (de)boarding a WCHC for connecting flights to avoid as much as possible contact in the terminal and especially in the small bridge. Only 1 PRM (plus one travel companion if needed) with the PA staff is allowed in the ambulift. The coveralls/suits for PA staff should be stored in the ambulift so that the PA staff will be able to put on the coverall inside the ambulift. After boarding the coverall can be taken off in the ambulift and put in a medical waste bin in the ambulift.
- To avoid long waiting times in queues and too close contact with other passengers, it is highly recommended that the PRM is boarded before other passengers and assisted in de-boarding after all passengers have left the aircraft.

Please note: Physical distancing cannot always be imposed during PRM assistance, considering as close contact between PA and PRM is unavoidable.



ACI EUROPE RECOMMENDATIONS – Physical Distancing and Protection Procedures for PRMs

- Physical distancing of 1.5m should be respected as much as possible. On an electrical minicar for 4 persons, only 1 PRM should be transported (if necessary, with a travel companion).
- In a minivan (e.g. on tarmac) a protective screen between the driver and the PRM should be installed.
- The PA staff should use elevators in the terminal with only 1 PRM (plus 1 travel companion if needed) and no other passengers.
- PRMs, like all passengers, will be required to access the terminal building with their own face- masks. The Airport Managing Body may make it possible to purchase masks, gloves, and hand sanitisers at the airport (for instance through vending machines).
- The Airport Managing Body and PRM assistance providers should be aware that for some passengers with breathing difficulties wearing a face mask might not be possible. In this case, the passenger should be exempt from wearing a face mask and an alternative solution should be discussed with the passenger, when possible.
- PRMs should be allowed to be accompanied by their certified assistance animals, such as guide dogs.

Please note: Cleaning activities will have an influence on the number of PA staff needed.



ACI EUROPE RECOMMENDATIONS – Special Cleaning and Disinfection Provisions for PRMs

- Sanitising products should be available for PRMs. These should be located in accessible places, with accessible signage and information to point to their location. The information to dispose of hygiene and sanitary materials should be accessible.
- If the passenger is picked up at a call point to ask for assistance, the buttons and touch screens of the call point should be cleaned with a disinfectant after each pick up.
- The equipment used for the PRM assistance should be disinfected after each use. This includes wheelchairs, boarding chairs, electrical minicars, minivans, ambulifts, but also electronic devices/ communication tools, etc. The cleaning should include all parts in direct contact with the driver/PA and with the passenger (e.g. like seats, safety belts, etc.).

Please note: Making information available in accessible formats is an obligation for airports.



ACI EUROPE RECOMMENDATIONS – Information for PRM and Special Procedures

- Information must be easy to find. This means efforts should be made to ensure that PRMs are aware of where they can find information relevant for their right to travel and adequate protection of their health while exercising this right. The information should be provided through mainstream information sources, social media and on websites of public authorities, airlines, and airports – on front pages so it is visible without having to search or click through multiple pages.
- Information about special procedures put in place for the PRM assistance and the protective materials used by PA staff should also be available on the website of the airport.
- This information should also be made available before finalising a flight booking, as well as sent by email or text message once a flight is booked.
- Additional information and communication means should be provided, such as easily findable, clearly written instructions at the information screens and at call points at the airport.



Dublin Airport / DUB

3.6 DISRUPTION MANAGEMENT AND CONTINGENCY PLANNING



GOALS FOR A HEALTHY PASSENGER EXPERIENCE

Reconsider disruption management and contingency planning to...

- Identify the required sanitary measures including their priorities, required resources and stakeholder responsibilities.
- Manage the implementation and continuous optimisation of sanitary measures at an airport.
- Ensure continued operations during a pandemic in a safe way for staff and passengers.

A major disruption like the COVID-19 crisis requires a holistic and aligned response, led by the Airport Managing Body in coordination with the national authorities and all involved operational stakeholders.

Each airport should have a pandemic plan in place, setting out the composition and mandate of steering committees to be established, identifying stakeholders to involve, required communications and inter-team coordination processes. It will be necessary to involve, coordinate and communicate with the entire airport community. This includes the airport's operational and corporate communications departments, airlines, ground handlers, sub-contractors and concessionaires, Air Navigation Service Providers (ANSPs), police, and customs as well as civil aviation, health, and other competent authorities.

The aim is to manage and align the overall airport's response to the crisis in order to:

- Minimise the impact of the pandemic.
- Protect the health of all staff working on the airport site irrespective of employer.
- Protect the health of passengers.
- Accelerate the recovery.

Based on the information available on the pandemic at the time of formulating the contingency plan different recovery scenarios should be developed. A high degree of uncertainty in terms of the length of the recovery phases will exist at the start of planning. As more information becomes available, the plan and related scenarios will have to be adjusted accordingly.

More general information on contingency planning can also be found in the ACI EUROPE Guidelines for Passenger Services at European Airports (Second Edition, 2018)⁴⁵ and the ACI Airport Business Continuity Handbook 2020⁴⁶.

45. ACI EUROPE Guidelines for Passenger Services at European Airports. Chapter 5.2.2 Contingency Planning, pages 72-77.

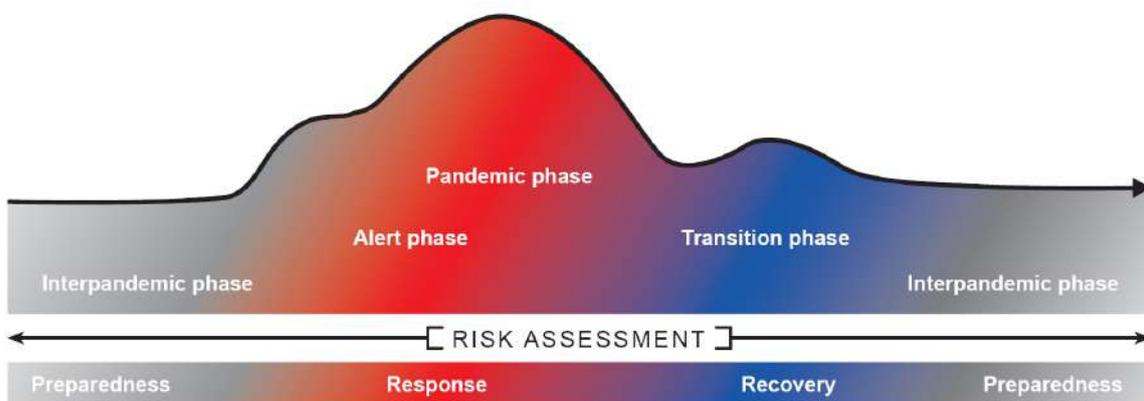
46. <https://store.aci.aero/product/airport-business-continuity-management-handbook/>

Timeframe

In the context of a pandemic the recovery will usually occur in a progressive yet non-linear way with different phases over a relatively long time period (18 to 24 months). This is in contrast to more common disruptions such as adverse weather conditions or industrial action, which lead to flight delays and cancellations over a relatively brief time period and which are usually followed by a sharp and swift recovery.



PICTURE 11 – WHO'S CONTINUUM OF PANDEMIC PHASES



Source: WHO

Pandemic phases:

1. Interpandemic period, which is the pre-emergency phase.
2. Pandemic alert phase, which is the developing alarm.
3. Pandemic outbreak period which is the emergency phase in progress.
4. Post-emergency or transition phase at which time WHO has declared the end of the threat.

This means that a considerable amount of planning and testing of related procedures and communications as well as training will have to be carried out during the interpandemic phase.

Gathering of information, evaluation of risks and development and implementation of pre-determined action plans addressing the different responses during each phase and associated control measures will have to be carried out in the interpandemic phase.



ADDITIONAL ACI EUROPE RECOMMENDATIONS

- A Pandemic Crisis Team should be established with immediate effect, which identifies the measures to be implemented and their priorities as well as allocates required resources:
 - The Pandemic Crisis Team assesses and evaluates the essential operational functions and determines strategies for maintaining critical airport functions, utilities, infrastructure and supplies at the same time as protecting the health and safety of employees and passengers. The establishment, in advance, of defined co-ordination mechanisms is imperative to the successful management of the pandemic crisis. Advanced planning and preparedness before a pandemic crisis are fundamental to mitigating the impact of a pandemic outbreak and accelerating the successful recovery to normal operations.
- A business continuity plan has to be prepared, which details how to continue operating safely with the available resources and the required measures:
 - Business continuity planning helps to minimise the economic impact of the crisis and to continue to operate safely with the available resources and the required measures. Close co-operation and communication with all stakeholders is key to effective disruption management and successful implementation of business continuity plans.

It is important to understand that both the Pandemic Crisis Team and Business Continuity Plan are relevant and should adapt to all four phases of a pandemic outbreak as classified by the WHO.

3.7 WASTE MANAGEMENT

Even in the context of the existing health emergency, environmental sustainability must remain a fundamental guiding principle of any choices made. Specifically, in terms of implementing measures outlined in this guidance document, such as use of materials, construction or improvement of facilities, adoption of new procedures.

The airport environmental and waste management plan has to carefully consider the waste disposal of materials such as masks, gloves, protective screen, etc., which will most likely consist of a range of non-recyclable materials.



PEOPLE



People (staff) constitute the third pillar of the passenger experience. While passengers welcome technology to customise services and manage each aspect of their journey, they still need to know that behind automatic processes there is a human being looking after them⁴⁷.

*“The way organizations deal with their customers, their employees and the broader community in a crisis is likely to leave lasting memories in customer minds. For most organizations business as usual cannot be expected to reign during the COVID-19 outbreak”*⁴⁸

In a crisis situation, sharing a consistent health safety culture between the Airport Managing Body and its stakeholders is paramount. The Airport Managing Body should play a guiding role to involve all stakeholders (Public authorities, Air Carriers, Ground Handlers, Sub-contractors, etc.) in order to adopt a common approach for the protection and reassurance of airport staff.

The airport culture should be effectively communicated and shared amongst all staff working at the airport. This will be an effective means to protect and reassure the travelling public.

Communication among stakeholders as well as with the public is important to build and regain confidence for airports. Relevant recommendations for a healthy passenger experience regarding communication are also included in this chapter.



GOALS FOR A HEALTHY PASSENGER EXPERIENCE – People

Ensure a healthy passenger experience by...

- Healthy staff feeling safe at work (Chapter 4.1).
- Motivated staff who are well informed and instructed regarding the new situation (Chapter 4.2).
- Staff building confidence through interactions with passengers (Chapter 4.3).
- Communication and engagement of stakeholders within and outside the airport (Chapter 4.4).
- Public communication (Chapter 4.5).

47. ACI EUROPE *Guidelines for Passenger Services at European Airports*. Second edition, June 2018.

48. McKinsey & Company, *Getting back to work. Leading the return to operational health*, May 2020.



ACI EUROPE RECOMMENDATIONS – Cleaning and Disinfection of Working Places and Sanitary Equipment⁵⁰

- Working places include offices, toilets, relaxation and break/lunch areas as well as locker rooms.
- Clean and disinfect working places at least in the morning and in the evening of each working day (airports to define how often, depending on area utilisation, etc.). Frequency of sanitisation should be determined through a risk assessment regarding the working place.
- Equip working places with dispensers of sanitary material like hydro-alcoholic gel, soap, and kits to clean surfaces.
- Ensure the correct level of air ventilation to avoid stagnation of droplets, where possible.
- In buildings with mechanical ventilation systems, extended operation times are recommended.
- If possible, keep ventilation on 24/7, possibly with lowered (but not switched off) ventilation rates when people are absent.
- Increase frequency of waste disposal to avoid accumulation of used PPE (e.g. masks and gloves) in waste containers.
- Request all staff at restaurants to wear face masks at work (in line with national advice and requirements).
- Install hand-sanitising stations at entrances to office buildings, break areas, etc.
- Rearrange or remove seating in working places to maintain distance between people.



ACI EUROPE RECOMMENDATIONS – Controls Prior to Access to the Working Place Equipment

- Airport Managing Bodies may consider measuring staff body temperature prior to the start of their shift. In case the measured temperature exceeds the threshold defined by national or local regulations, all actions defined by national regulation should be implemented (contact of personal doctor, quarantine, hospitalisation, etc.).
- Suspend fingerprints access control for airport staff and replace it with alternative touchless methods.
- Provide de-gowning areas for medical personnel (and others, such as PRM assistants where necessary).

50. Please refer to section 2.2.



Zagreb Airport / ZAG



Rome–Fiumicino International Airport / FCO



ACI EUROPE RECOMMENDATIONS – Behavioural and Hygiene Etiquette

- Avoid unnecessary physical contact (e.g. hand shaking).
- Staff should clean hands often, and after contact with an ill person, by washing hands with soap and water for at least 30 seconds. If soap and water are not available and hands are not visibly dirty, an alcohol-based hand sanitiser that contains at least 60% alcohol may be used. However, if hands are visibly dirty, always wash hands with soap and water.
- Additional key moments to clean hands include:
 - After blowing one's nose, coughing, or sneezing.
 - After using the restroom.
 - Before eating or preparing food.
 - After contact with animals or pets.
 - Before and after providing routine care for another person who needs assistance such as PRMs.
- Adopt respiratory etiquette: sneezing or coughing in a handkerchief/elbow, avoiding hand contact with respiratory secretions.
- Do not touch mouth, nose, or eyes.
- Do not share bottles or glasses.
- Clean computers, keyboard, mouse with disinfectant products daily.
- Staff should familiarise themselves with measures and guidelines (airports should advise where staff can find this information).
- Educate staff to recognise the symptoms of COVID-19 and provide instructions on what to do if they develop symptoms within 14 days after their last possible exposure to the virus.
- As a minimum, any staff should immediately notify their supervisor and the local health department if they develop symptoms of COVID-19; Airport's health departments should provide guidance on what actions need to be taken.

Ensure physical distancing measures are in place in all staff areas (break out areas, canteen, locker areas, etc.) and inform staff of actions taken to manage the flow of staff:

- Extend the opening hours of canteens and, if possible, install a people counting system at access points to regulate the flows and guarantee that the rate people/square metre defined by national or local regulation is fulfilled.
- Organise lunch or pause breaks times to avoid concentration of people.
- Design a new layout of locker rooms, where possible.

4.2 PEOPLE (STAFF) SHOULD HAVE CLEAR INFORMATION AND INSTRUCTIONS PRIOR TO COMING BACK TO WORK

Prior to staff coming back to work after a period of isolation at home, communication is of the utmost importance and Airport Managing Bodies should coordinate this with its stakeholders.



ACI EUROPE RECOMMENDATIONS

- Online training should be arranged for staff education/briefing.
- General information to all staff should be shared about:
 - New layout of premises and processes further to the COVID-19 outbreak and its consequences on traffic and operations.
 - Expected Frequently Asked Questions by passengers, arising from new passengers needs and expectations with the prime concern on a healthy journey.
 - New technology in place at the airport for processes and a touchless journey.
 - The use of new digital tools needed to perform smart working and to communicate (videoconferences, webinars, other communication channels, etc.).
 - Behaviour rules at work.
 - Specific training available to deal with the health-concerned passenger.
 - Building a new relationship with the passengers, especially for frontline staff.
 - Quick reference materials including tips and main contact telephone numbers.
- Listen to staff: communication channels should be implemented where staff can voice their needs, their fears, their concerns and have the confidence of being heard and get back a quick answer. This should also take place through direct phone contact with the responsible or medical/psychological team.
- Staying connected with colleagues while working from home is crucial to minimise social isolation. For this purpose, a virtual staff social network should be encouraged, using easy web tools on the market in order not to leave aside older working force less familiar with technology. Physical distancing should be combined with social intimacy.

4.3 BUILDING A NEW RELATIONSHIP STAFF/PASSENGER

Passengers will still need a contact with staff, searching reassurance from them, even more in this period where an elevated level of fear might be experienced in addition to pre-existing travel related stress. However, the relationship and the interaction between staff and passengers will change and needs to be adapted to the new situation.



ACI EUROPE RECOMMENDATIONS

- Staff need to be trained on changed procedures and processes in order to minimise direct contact of staff with passengers (e.g. travel documents should not be touched by staff, hand search for security and customs should be replaced by other methods, close face to face situations should be avoided).
- Specific training of staff to provide reassurance to the passenger in various situations and communicate the fact that the airport has taken all necessary measures to guarantee a healthy passenger journey.
- Training in human body language, in particular for frontline staff, to provide enhanced understanding capabilities to staff in their interaction with passengers (wearing a mask transforms the body language since emotions and smiles cannot be seen).
- Support of a psychologist can in specific cases also be considered to rebuild relationships between staff and passengers.
- Deploy mobile staff all over the airport in order to accompany the passenger in a revised journey with respect of previous experiences in normal times.

4.4 COMMUNICATION AND ENGAGEMENT OF STAKEHOLDERS WITHIN AND OUTSIDE AN AIRPORT



EASA/ECDC RECOMMENDATIONS⁵¹

According to their airport emergency plan, airport operators should appoint a coordinator to ensure the uniform application of preventive measures mitigating the public health risk during this particular crisis by all stakeholders providing services at the airport. The coordinator should be in direct contact with the airport public health authorities and the local (and/or national) public health authorities.

Engage with stakeholders from within and outside the aviation industry to reach out to larger groups of consumers to:

- Amplify airports' health and sanitary messages through a wide variety of stakeholders and business partners' communications channels.
- Strengthen cross-industry collaboration to foster European aviation recovery.



ACI EUROPE RECOMMENDATIONS

- Discuss and clarify the goal and key messaging to be pushed out in collaboration with EU and national authorities and stakeholders and regularly assess the communication actions put in place.
- Collect all information regarding the pandemic including any recommendations and regulation from official channels, i.e. your Government, civil aviation, health authority, etc.
- Keep your staff, trade unions, stakeholders, airlines, Government, authorities (civil aviation, border control agencies, health, etc.), business partners, local community and travelling public regularly updated on your restart plan.
- Harmonise sanitary measures of all operational stakeholders at the airport to ensure the consistency needed to restore passenger confidence.
- Ensure that staff of all stakeholders inside an airport comply with the same rules.
- Do not forget that staff and airport stakeholders (e.g. cleaning and trolley contractors, etc.) are also your important communicators. Provide them with accurate and up-to-date information and encourage them to amplify the key messages and information.

⁵¹. EASA/ECDC COVID-19 Aviation Health Safety Protocol - Operational Guidelines for the management of air passengers and aviation personnel in relation to the COVID-19 pandemic (version 2.0).

Communications networks should include:

- Air carriers
- Ground handling agents
- Air Traffic Management or Air Navigation Service Providers
- Local hospital(s) and health providers
- Airport medical service providers
- Emergency medical services
- Police and customs authorities
- Security providers
- Airport retailers and food and beverage concessionaires
- Other

External Stakeholders:

- Local/regional/national governments, regulators, and public health authorities
- Travellers (before, during, and after the airport experience)
- Other airports in same region or network
- Travel agents and hotel associations
- Tourism organisations
- International organisations involved with migration
- Press and media



Milan Malpensa Airport / MXP

4.5 PUBLIC COMMUNICATION

Successful public communication to:

- Build trust and confidence from consumers about using the airport and more generally air travel.
- Emphasise the strategic and positive role of the airport in promoting the well-being of the travelling public.
- Promote an image of the airport as a clean, healthy, and safe place to travel through.
- Strengthen engagement with the travelling public.

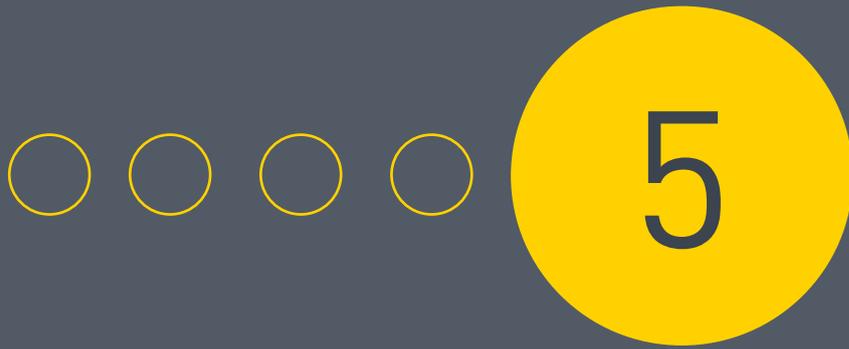


ACI EUROPE RECOMMENDATIONS

- Publicly announce the restart of airport operations by providing information on the sanitary and health measures taken by airports.
- Disseminate information on both general measures (e.g. "Our airport terminals are disinfected regularly") and more concrete measures ("e.g. "You can find gel stations at our airport before the security checkpoints").
- Ensure targeted communication with more vulnerable consumers (e.g. elder consumers, passengers more concerned about health-related issues).
- Identify the most appropriate communications channels and ensure accurate communication and information flow through airport information desks, airport digital media/website tools and on-site communications.
- Work hand in hand with the airport facilitation teams to define and provide the most accurate information at the right moment.
- Do not give the opportunity to others to communicate in your place.
- Communicate on positive and negative news.
- Do not forget to communicate with your local community, emphasising the role of the airport as a strong economic engine.



Munich Airport / MUC



CONCLUSION



SHAPING A HEALTHY PASSENGER EXPERIENCE

1

Remember that health concerns will define the experience, confidence, and behaviour of passengers.

2

Engage with your passengers and determine their specific needs and expectations at your airport.

3

Comply with the national, regional, and local health legislation.

4

Premises: Physical distancing will be required for some time once activities restart.

5

Premises: Additional risk mitigation measures are also needed, including:

- Use of face masks
- Enhanced cleaning and disinfection
- Enhanced HVAC maintenance and operations
- Protective screens

6

Processes: Existing processes need to be adapted to comply with new requirements.

7

Processes: Note that additional processes may be required at national level.

8

Processes: Use innovative technologies to support the new actions.

9

People (staff): Protect your staff and those of your stakeholders.

10

Communicate your measures efficiently to the public and among stakeholders to build confidence.



ANNEXES



ANNEX 1 – OVERVIEW OF TECHNOLOGIES FOR A HEALTHY PASSENGER EXPERIENCE

Table 1 provides an overview of the key drivers that implement certain solutions or technologies as described in Chapter 3 Processes. The indicators: H – M – L have been derived by taking into consideration the following parameters:

- **H** = high importance + low complexity + high potential to address a driver of physical distancing.
- **M** = medium importance + low complexity + medium potential.
- **L** = low importance + high complexity + low potential.

Other elements have also been identified that are not necessarily related to technology but are more procedural and therefore worth mentioning:

- Gate Area redesign.
- Boarding procedure.
- Extra hand sanitising stations available throughout the airport, including passport control.
- Usage of PPE for the staff, plastic screens at the check-in counters and information booths.
- Sanitisation of check in areas based on checked passengers and on regular times.
- Redesign of queueing area.
- New infrastructure to protect customs operators.
- For Automatic Passport Control, sanitisation of the passport touchpoint might be needed on a regular basis.



Madrid-Barajas Adolfo Suárez Airport / MAD



TABLE 1 – KEY DRIVERS IMPLEMENTING CERTAIN SOLUTIONS OR TECHNOLOGIES

Drivers	Technology	Solution	At Home	Travel to Terminal / Orientation	Check-in	Boarding Pass Control	Security Control	Border Control	Customs	Boarding / Remove / Deboarding	Baggage	Ground Handling
Operations	Biometric	Biometric Gates										
Operations	Biometric	Biometric Registration Kiosks										
Operations	Biometric	Biometric Self-Service Kiosks			H							
Operations	Biometric	Biometric Registration Mobile	H									
Operations	Biometric	Biometric Gates										
Operations	Biometric	Boarding Pass Readers										
Operations	Biometric	Boarding Pass Validation										
Operations	Imaging	CT Scanners										
Operations	Imaging	Enhanced Advanced Imaging										
Operations	Mobile App	Technology (eATL)										
Operations	Mobile App	Mobile App										
Operations	People Counting	People Counters										
Operations	RMS	Resource Allocation - load balancing pax volume										
Operations	RMS	Resource Allocation - new parameters										
Operations	Self-Service	Automated Bag drop										
Operations	Self-Service	Autonomous Self-Service Kiosks										
Operations	Self-Service	Bag Tag Kiosk										
Operations	Self-Service	Bag Tag - Home printed										
Operations	Self-Service	Self-Service Check-in										
Operations	Self-Service	Self-Service Kiosks										
Operations	Self-Service	Voice Recognition Self-Service Kiosks										
Operations	TM/ATTC	TM/ATTC										
Operations/Sanitisation	IoT	IoT of toilets and cars										
Par Health	Self-Service	Thermal Scanner										
Sanitation	UVC	Detection of aircraft interiors										
Sanitation	UVC	Biometric Sanitation										
Sanitation	Protective Screens	Protective Screens										
Sanitation	UVC	Sanitisation and ventilation of buses										
Sanitisation	UVC	In-line UV-C lighting tunnels										
Sanitisation	UVC	UV Sanitization of the trays										
Sanitisation	UVC	UV-C										
Physical Distancing	Acoustic Spotlight	Acoustic Spotlight										
Physical Distancing	Computer Vision	Computer Vision										
Physical Distancing	Computer Vision	Computer Vision and AI										
Physical Distancing	Mobile App	Video Analytics and AI										
Physical Distancing	Mobile App	Enforce boarding by seat, via mobile										
Physical Distancing	PAS	Queue Token Mobile App										
Physical Distancing	PAS	Passenger Announcement System (PAS)										
Physical Distancing	Queue Mgmt	Queue Management (SQ)										
Physical Distancing	Queue Mgmt	Virtual Queuing & Boarding solution (e.g. FIDS and Airport App)										
Physical Distancing	RMS	Resource Allocation - bag areas (SD)										
Physical Distancing	RMS	Resource Allocation - block of belts (SD)										
Physical Distancing	RMS	Resource Allocation - Counters										
Physical Distancing	Signage	Benches										
Physical Distancing	Signage	Display Screens										
Physical Distancing	Signage	FIDS Screens										
Physical Distancing	Signage	Floor Signage (SD)										
Physical Distancing	Signage	Stanchion or tensa barriers										
Physical Distancing	Virtual Assistants	Virtual Assistants										
Physical Distancing	Wayfinding	Wayfinding										

Table 2 provides a brief description of key technologies identified for a healthy passenger experience. The table also provides a list of technologies that are available in the market, and it is for airports to consider their potential to be implemented.



TABLE 2 – KEY TECHNOLOGIES IDENTIFIED FOR A HEALTHY PASSENGER EXPERIENCE

Biometric	Biometric technology refers to the use of technology to identify an individual using a biometric feature (e.g. facial or fingerprint). It can be deployed to automate the passenger journey from check-in, security control, border control, and boarding
Imaging	Advanced technology such as computed tomography (CT) for better 3D images for baggage screening
Mobile API	Mobile application programming interface (API) allowing the creation of applications that access the features or data of an application or service
People Counting	Automated system to electronically count the number of people (a.k.a. people counter) using varied technologies such as thermal or Wi-Fi
RMS	Resource Management System (RMS) is a scheduling, capacity planning and resource management system for fixed airport resources and management of mobile resources (i.e. buses, trolleys, loaders as well as staff for the purposes of assigning tasks)
Self-Service	Combination of technologies to enable passenger self-service for check-in (kiosk, web or mobile), kiosk to issue bag tags, automated bag drop, boarding, and payment
TIMATIC	An IATA solution used by airlines and/or ground handlers to verify requirements for passenger travel documents for their destination and any transit points. The solution is also used to ensure their customers are compliant with border control rules and regulations
IoT	Internet of Things (IoT) is a network of sensors of uniquely identifiable endpoints with the ability to transfer data and communicate using Ip/Wireless connectivity. Examples of usage of IoT are tracking assets (e.g. trolleys and carts), geo-fencing, and queue management
Self-Service	Repurposing of self-service kiosks with thermal scanners to measure passenger's temperature
Thermal Scanner	The technology varies from handheld devices to solutions combining thermal and optical cameras that could be permanently sited or mounted on trolley for mobility purposes
BMS	Building Management System (BMS) controls and monitors other systems such as the Heat, Ventilation and Air Conditioning (HVAC). A smart or intelligent building uses automated processes and interconnected technologies (e.g. IoT) to automatically and proactively manage systems such as the air conditioning and ventilation of an airport

Protective Screens	Retrofitting check-in counters with protective screens
Sanitation	Disinfection of buses and other locations
UVC	Ultraviolet C (UVC) is a technology that uses ultraviolet lights to disinfect or sanitisation purposes. In Hong Kong, a robot has been deployed to clean and sanitise public areas of the airports such as toilets
Disinfection	Use of autonomous machines to spray disinfectant on objects or rooms; use of disinfectant booths and robots to clean terminals
Acoustic Spotlight	Acoustic Spotlight technology creates a tight, narrow beam of sound that can be controlled with the same precision as light. For example, aiming the speaker at a desired listening area to keep sound focused specifically on passengers within the zone (i.e. radius of the spotlight) and quiet everywhere else
Computer Vision	A field of artificial intelligence used to understand and interpret digital images or videos. For example, it can be used to enable monitoring areas where it is difficult to maintain the physical distance (e.g. passenger screening area or bag claim/ carousel area) – the solution would use feed from existing CCTV cameras and infrastructure layout to provide video analysis with a heat map showing where people are getting closer to the recommended physical distance
Mobile API	Development of new applications such as a Queue Token app to call out passengers when they are ready to be serviced (e.g. security screening or boarding) and/or advice when they are too close to others, in violation of physical distancing rules
PAS	Public Announcement System to broadcast health and safety messages at specific times and in different languages. An option for silent airport is the use of digital paging (i.e. using FIDS or other screens to display messages)
Queue Management	Queue Management can leverage different technologies to manage and control flow of passengers such as cameras, video analytics, and sensors
RMS	Resource Management System – introduce new parameters to account for physical distancing and the impact on the allocation of resources such as number of check-in desks to be opened, allocation of bag carousels
Signage	Signage leverages different systems (e.g. banners, FIDS, advertising screens, digital signage) to enable the creation, display, and broadcast of messages across different screens deployed at the airport. For example, FIDS screens could be used to show the usual flight information on one page, and rolling onto another page to display health and operational messages
Virtual Assistants	Based on holographic images that provide information. A more advanced version is one with Artificial Intelligence that can answer passenger commonly asked questions
Wayfinding	Wayfinding technology complements an airport's mobile app that have wayfinding features as well as the airport Information Kiosks to ensure that passengers know where to find the facilities they are looking for. Including messages about physical distancing, changes in procedures, and other health related information

ANNEX 2 – BACKGROUND INFORMATION

Cleaning and Disinfection

Disinfectants are classified as biocidal products and are regulated by the EU Biocidal Products Regulation (BPR) (EU) No 528/2012 to ensure that risks are accurately assessed before they are placed on the market in EU/EEA countries. Currently, for most disinfectant products available in the European Union market for SARS-CoV-2, the transitional measures of the BPR apply, as set out in Article 89. This means that most disinfectants are placed on the market subject to national legislation until the evaluation of the contained active substance(s) is finalised in the EU review programme. In general, alcohol-based disinfectants (ethanol, propan-2-ol, propan-1-ol) have been shown to significantly reduce the infectivity of enveloped viruses like SARS-CoV-2, in concentrations of 70-80% with one-minute exposure time. However, ethanol has not yet been approved under the BPR, so biocidal products based on ethanol are not authorised under the BPR but are available under transitional measures. Most Member States do not have an authorisation or registration system for the products under transitional measures and, therefore, do not have an exhaustive overview of the disinfectant products on their market. Biocidal products having virucidal activity and authorised under the BPR are effective against SARS-CoV-2. This also applies to products used as hygienic hand and skin disinfectants, which state they have limited virucidal activity or activity only against enveloped viruses.

As mentioned before, cleaning helps to remove pathogens or significantly reduce their load on contaminated surfaces and is an essential first step in any disinfection process. Cleaning with water, soap (or a neutral detergent) and some form of mechanical action (brushing or scrubbing) removes and reduces dirt, debris, and other organic matter such as blood, secretions, and excretions, but does not kill micro-organisms. Organic matter can impede direct contact of a disinfectant to a surface and inactivate the germicidal properties or mode of action of several disinfectants. In addition to the methodology used, the disinfectant concentration and contact time are also critical for effective surface disinfection. Therefore, a chemical disinfectant should be applied after cleaning to kill any remaining micro-organisms.

Disinfectant solutions must be prepared and used according to the manufacturer's recommendations for volume and contact time. Concentrations with incorrect dilution during preparation (too high or too low) may reduce their effectiveness. High concentrations increase chemical exposure to users and may also damage surfaces. Enough disinfectant solution should be applied to allow surfaces to remain wet and untouched long enough for the disinfectant to inactivate pathogens, as recommended by the manufacturer.

Recent publications have evaluated the survival of SARS-CoV-2 on different surfaces. The environmental stability of SARS-CoV-2 is up to three hours in the air post-aerosolization, up to four hours on copper, up to 24 hours on cardboard and up to two to three days on plastic and stainless steel, albeit with significantly decreased titres. These findings resulted from experiments in a controlled environment and should be interpreted with caution in the real-life environment.

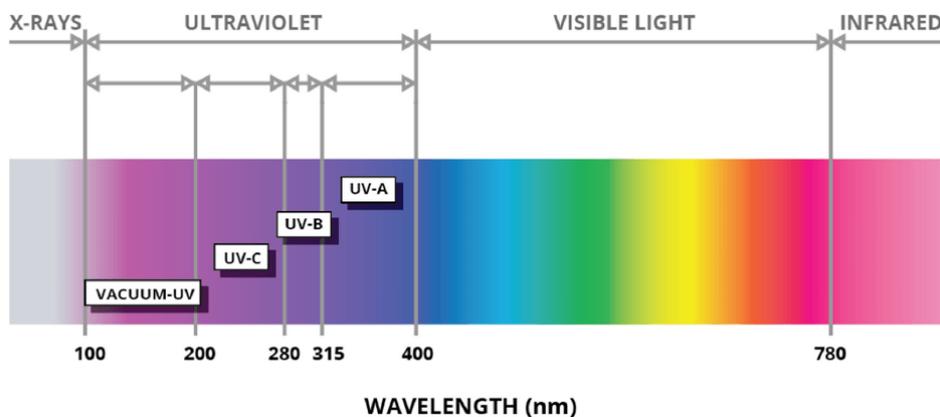
Ultraviolet Germicidal Irradiation (UVGI) Disinfection

Cleaning and disinfection may leave behind residual contamination. For this reason, Ultraviolet Germicidal Irradiation (UVGI) disinfection can play a role in a multiple-barrier approach to reducing the transmission of COVID-19.

Ultraviolet light (UV) is a type of naturally present electromagnetic radiation that is in sunlight and actually makes up approximately 10% of the total light generated by the sun.



PICTURE 12 – THE ELECTROMAGNETIC SPECTRUM



UVGI is a method of disinfection that uses short wavelength ultraviolet light (UV-C) to inactivate or kill micro-organisms and pathogens. Essentially, UVGI is the use of UV light with sufficiently short wavelengths to disinfect surfaces, air, and water.

The effectiveness of germicidal UV light depends on the length of time a microorganism is exposed to UV, as well as the intensity and wavelength of the UV radiation.

It is important to understand the difference between sterilisation, disinfection, and decontamination as these terms are often incorrectly used interchangeably, which can cause confusion in regard to the effectiveness of UVGI (as well as the avoidance of potential legal ramifications).

- **Sterilisation:** A process that destroys or eliminates all forms of microbial life and is carried out by physical or chemical methods.
- **Disinfection:** A process that eliminates many or all pathogenic microorganisms on inanimate objects.
- **Decontamination:** To decontaminate is to make an object or area safe by removing, neutralising, or destroying any harmful substance. Basically, decontamination is the result after the processes of sterilisation or disinfection.

There are two basic types of commercially viable lamps that provide the UV-C necessary to be germicidal. Commercially viable systems or lamps are defined as those that provide the necessary UV-C light intensities and dosages that are actually able to disinfect larger areas and surfaces. There are other light sources of UV-C, such as LED, which do provide ultraviolet light in the necessary germicidal wavelengths of 100nm to 280nm, but they are not currently able to provide the intensity of light needed to disinfect surfaces.

Most of these lamps are sold as components in a complete disinfection system, or as linear/compact lamps. The types are:

Lower pressure mercury lamps:

- These lamps are very similar to conventional fluorescent lamps in shape and form, however, the UV-C lamps lack fluorescent phosphor and are often made of fused quartz, as opposed to borosilicate glass.
- These allow the light produced by the mercury arc within the lamp to pass out of the glass unmodified, generating light in the germicidal ultraviolet wavelength.

Pulsed xenon:

- Xenon arc lamps are a type of gas discharge lamp that generates light by passing electricity through ionised xenon gas.
- Often use flashes of germicidal ultraviolet light lasting a few milliseconds every six seconds or so.

Pulsed UV light systems such as pulsed xenon are able to combine the germicidal effects of UV-C lighting with the thermal disintegration of cell walls from the intensity and speed of the photonic delivery.

Scientific evidence and rationale for the use of face masks

Medical face masks are recommended as a means of source control for persons who are symptomatic in order to prevent the spread of respiratory droplets produced by coughing or sneezing and has been shown to decrease the release of respiratory droplets carrying respiratory viruses; they are recommended for the reduction of transmission of tuberculosis and influenza. Respiratory etiquette (i.e. covering of the mouth and nose with a tissue when coughing) also aims at limiting the spread of infection.

There is increasing evidence that persons with mild or no symptoms at the pre-symptomatic and early stages of infection can contribute to the spread of COVID-19. The role of asymptomatic infections in transmission is unknown. The evidence comes from viral shedding studies, epidemiological investigations of COVID-19 clusters and inferences through modelling. A face mask may help reduce the spread of infection in the community by minimising the excretion of respiratory droplets from infected individuals who may not even know they are infected and before they develop any symptoms. In this respect, mask use by asymptomatic persons can be regarded as an extension of the current practice of face mask use by symptomatic individuals.

There is conflicting evidence on the protective effect for the wearer of medical face masks for influenza-like illness (ILI) and laboratory-confirmed influenza in household settings. Based on the lack of evidence, it has so far not been recommended that people who are not ill or who are not providing care to a patient should wear a mask to reduce influenza or COVID-19 transmission. However, WHO's guidance on 'Non-pharmaceutical public health measures for mitigating the risk and impact of epidemic and pandemic influenza', conditionally recommends face mask use in the community for asymptomatic individuals in severe epidemics or pandemics in order to reduce transmission in the community; this is based on mechanistic plausibility for the potential effectiveness of this measure. It should be noted that all relevant evidence comes from studies on influenza and other coronaviruses and may not be directly applicable to COVID-19.

There is no evidence that non-medical face masks or other face covers are an effective means of respiratory protection for the wearer of the mask. Overall, various non-medical face masks were shown to have exceptionally low filter efficiency (2–38%). In one study, cotton surgical masks were associated with a higher risk of penetration of microorganisms and ILI compared to no masks. There are no established standards for self-made non-medical face masks. One of the advantages of non-medical face masks made of cloth or other textiles is that they can be made easily and can be washed and reused.

Medical and non-medical face masks are used extensively by the general public in Asian countries, for example China, Singapore, South Korea, and Japan. Face-mask use has been increasingly common since the 2003 SARS epidemic. In Hong Kong, 76% of the population were wearing a face mask during the SARS epidemic. In one study from China, wearing a face mask was associated with a lower risk of SARS among persons without known contact with SARS patients. It is not known whether the use of these masks when going out in public is linked to the lower COVID-19 rates observed in some of these countries, because mask use is only one of many response measures and practices that have been applied and their practice for respiratory etiquette and hand hygiene are considered higher than elsewhere.

The use of face masks in the community may primarily serve as a means of source control. This measure can be particularly relevant in epidemic situations when the number of asymptomatic but infectious persons in the community can be assumed to be high. Wearing a face mask could be considered, especially

- when visiting busy, closed spaces, such as grocery stores, shopping centres, etc.
- when using public transport.
- for certain workplaces and professions that involve physical proximity to many other people (such as members of the police force, cashiers – if not behind a glass partition, etc.).

ANNEX 3 – PERSONAL PROTECTIVE EQUIPMENT (PPE)



TABLE 3 – SUMMARY OF PERSONAL PROTECTIVE EQUIPMENT (PPE) AND PROTECTION OFFERED

<p>Respirator e.g. class 2 or 3 filtering face-piece (FPP2/FFP3)</p>	<p>Respiratory protection:</p> <ul style="list-style-type: none"> • Protects wearer against inhalation of droplets and small airborne contaminants, including aerosols. • Requires fit-testing. • Primarily used by healthcare workers, particularly during aerosol-generating procedures.
<p>Medical face mask</p>	<p>Respiratory protection:</p> <ul style="list-style-type: none"> • Protects against exhaled droplets when worn by ill patient. • Protects the user against potential large infective respiratory droplets in the environment. • Does not require fit-testing.
<p>Goggles (or face shield or visor)</p>	<p>Eye protection:</p> <ul style="list-style-type: none"> • Prevents exposure of eye mucosa. • Must fit contours of user's face and be compatible with the respirator if this last is worn.
<p>Long-sleeved water-resistant gown</p>	<p>Body protection:</p> <ul style="list-style-type: none"> • Prevents against clothes and body contamination. • Can be non-sterile (unless used in a sterile environment, e.g. operating room). • If not water-resistant, single-use plastic apron worn over the gown can be used.
<p>Disposable gloves</p>	<p>Hand protection:</p> <ul style="list-style-type: none"> • Gloves come in different textures, materials, colours, qualities, and thickness.
<p>Non-medical face mask ("community mask")</p>	<ul style="list-style-type: none"> • Cannot be considered protective measure against COVID-19. In case of severe PPE shortages and if medical masks are not available, cloth masks are suggested as a last re-sort. • Not to be used by healthcare workers.



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