AIRPORT CONSORTIUM ON CUSTOMER TRUST

Terminal and Passenger Facility Design

TERMINAL AND PASSENGER FACILITY DESIGN

APRIL 2021

CURRENT VS PROPOSED QUEUING PROCESSES

Terminal and Passenger Facility Design

Executive Summary

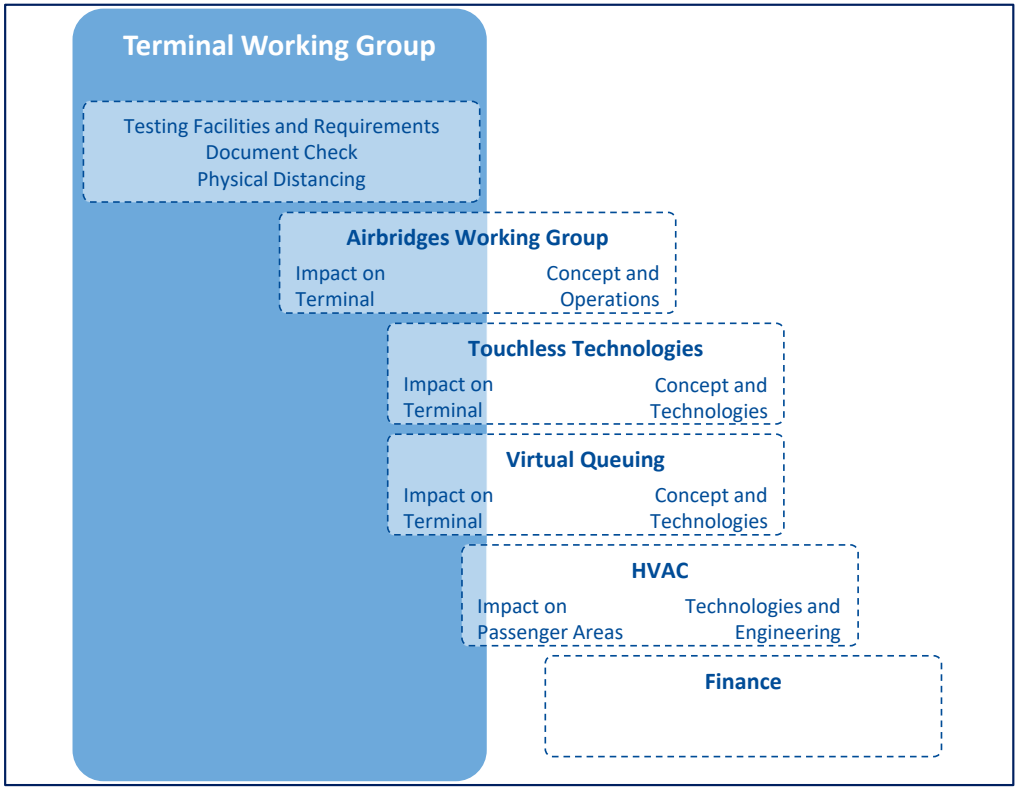
AAAE ACT Terminal Working Group is establishing pilot projects, identifying the current impact on terminals, and documenting lessons learned through a guidebook to facilitate the next stage of the recovery in the customer journey and our terminals.

The Terminal Working Group is coordinating closely with the other technical working groups, especially Airbridges/Testing and Virtual Queueing.

Three main themes have been identified that impact the passenger journey and terminal:

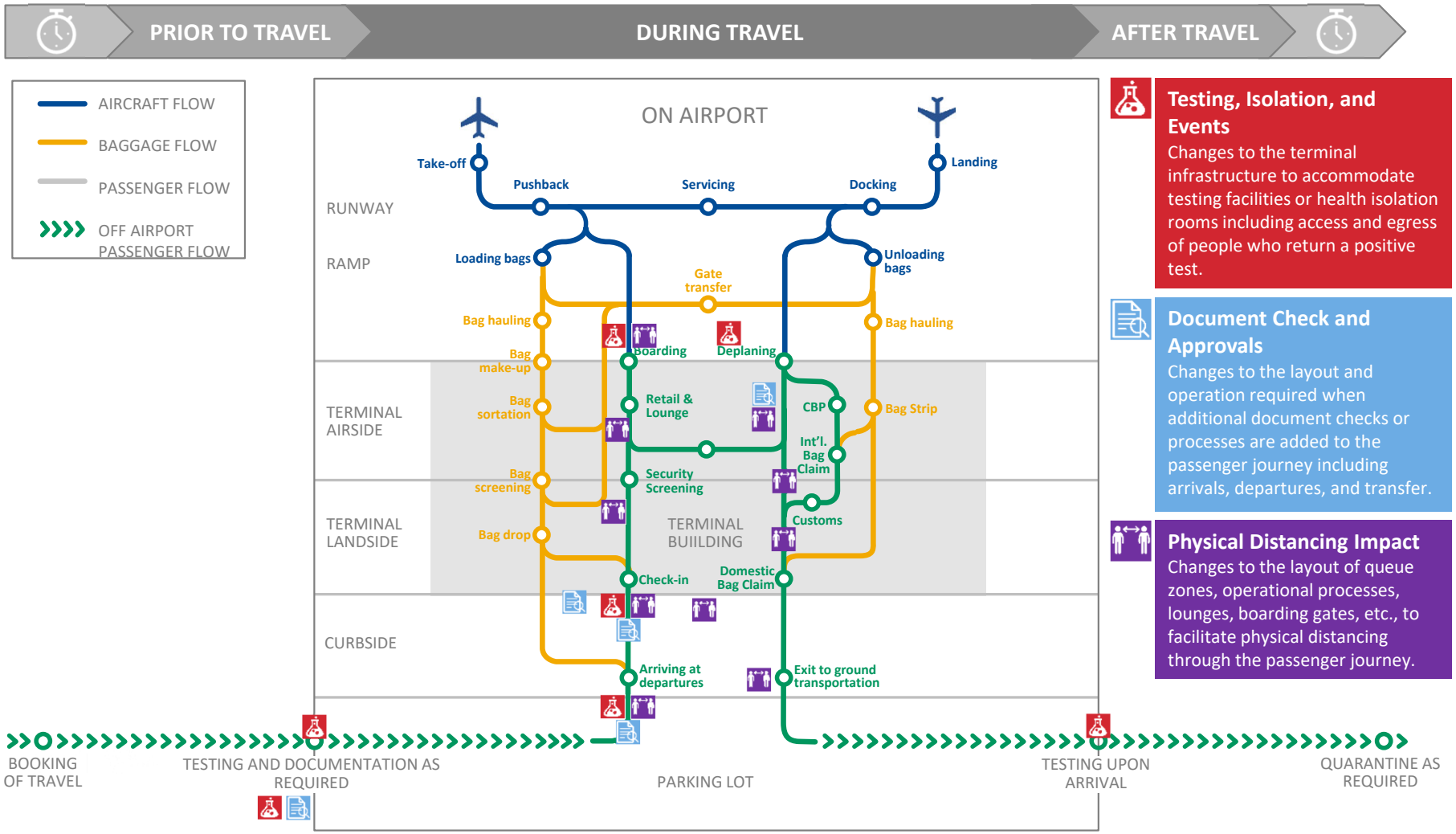
1. Testing Facilities and Requirements
2. Document Checks
3. Physical Distancing

While the current pandemic is seen as a catalyst for these pilot projects, there should be a focus on pilot projects which improve the passenger experience both during and following the pandemic.



Relationship of the Terminal Working Group with other workstreams

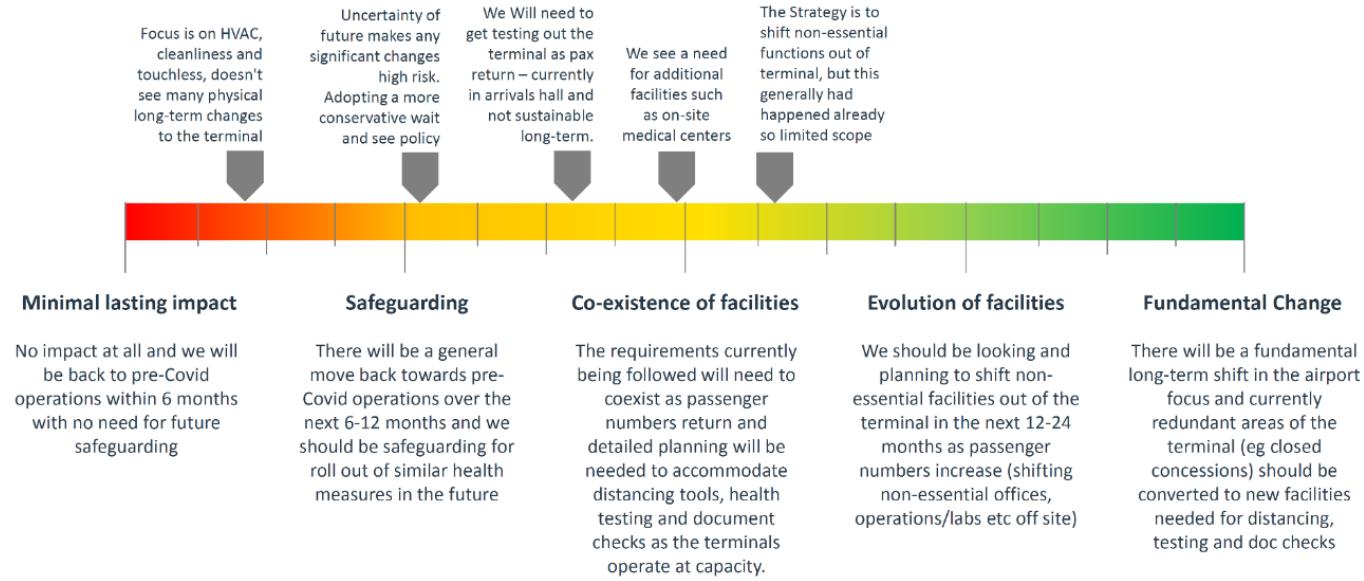
Passenger Journey and Intervention Points



Terminal and Passenger Facility Design

Executive Summary

During March 2021, headline discussions were held in the Working Group on the long-term impact on the terminal. The consensus was one of “safeguarding” rather than “fundamental change” with views being expressed on the priorities of airport and terminal operators in a reduced CapEx environment.



The focus is away from interventions focusing solely on the pandemic; a change from the start of this working group, and the group agreed that when pilot projects are deployed, the focus should not be solely on pandemic-related interventions but improving the passenger experience with safeguarding for future health events.

As such, the pilot projects developed have a focus on improved passenger experience while being able to assist in the current and future health events.

GUIDEBOOK:
PHYSICAL DISTANCING

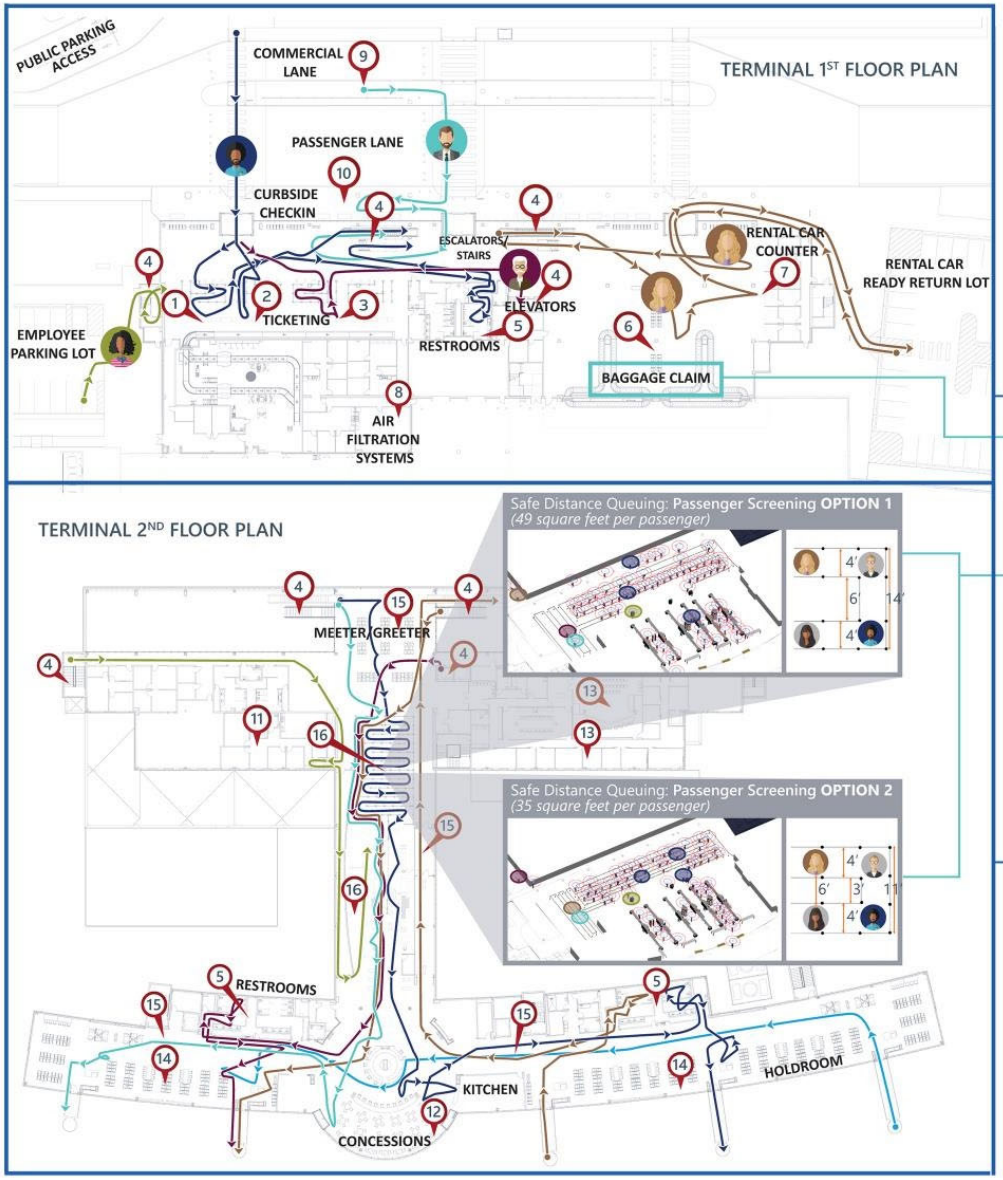
Physical Distancing

Executive Summary

This Terminal Working Group focused on physical distancing and strategies for its implementation within the airport to reduce the transmission of COVID-19. In collaboration with JFK IAT, GTAA, LAWA, and DFW, the group identified locations along the passenger journey where physical distancing measures would be needed and the impact it would have on the physical layout and operations of the terminal. While many airports have implemented various programs to manage physical distance within the terminal, the working group emphasized the need for signage standards, barriers that are effective yet sustainable, and checkpoint queuing that minimizes its footprint while providing effective protection to passengers and staff. Finally, the working group identified two pilot projects that have the potential to more effectively manage social distancing with the added advantage of long-term benefits to the airport beyond COVID-19 response.

This Guidebook and its recommendations are intended as a resource for airports to consider when implementing solutions to manage physical distancing. While some solutions have been identified, a framework has been established, from which other solutions and pilot studies may be developed.

Passenger Journey Mapping Through Terminal



LEGEND: (3)

1. Ticketing – queuing, person-person contact (emp/pax), materials
2. Ticketing – kiosk, baggage drop
3. Ticketing – queuing, baggage drop
4. Vertical/horizontal circulation – escalator/elevator/stairs/ people movers
5. Restroom – touch points, ventilation, wastewater
6. Baggage claim - queuing, access
7. Rental car counters – queuing, person-person contact (agent/pax)
8. Building Systems - Air Handling, Ventilation
9. Commercial – (tnc, shuttle vans, light rail), public transportation
10. Curbside baggage drop
11. Federal inspection services (tsa, cbp, faa, leo)
12. Concessions - Social Distancing, Service Type
13. Airline Offices/Operations - social disancing/protocol
14. Holdroom - queuing, person-person contact
15. Circulation
16. Passenger Screening

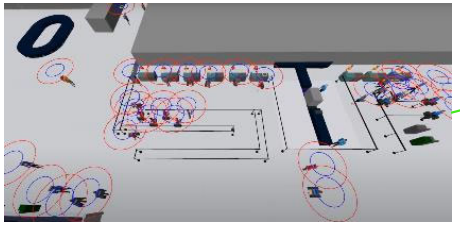
(3) *Terminal Building Facilities will be investigated to develop a representative broad spectrum of conditions*

Passenger Journey Mapping through terminal, showing areas identified for physical distancing initiatives. Passengers should maintain face coverings and maintain physical distancing in line with local health regulations. In the unlikely event that an infected person is in the terminal, contact with others should be minimized through isolation, and sanitization protocols enacted.

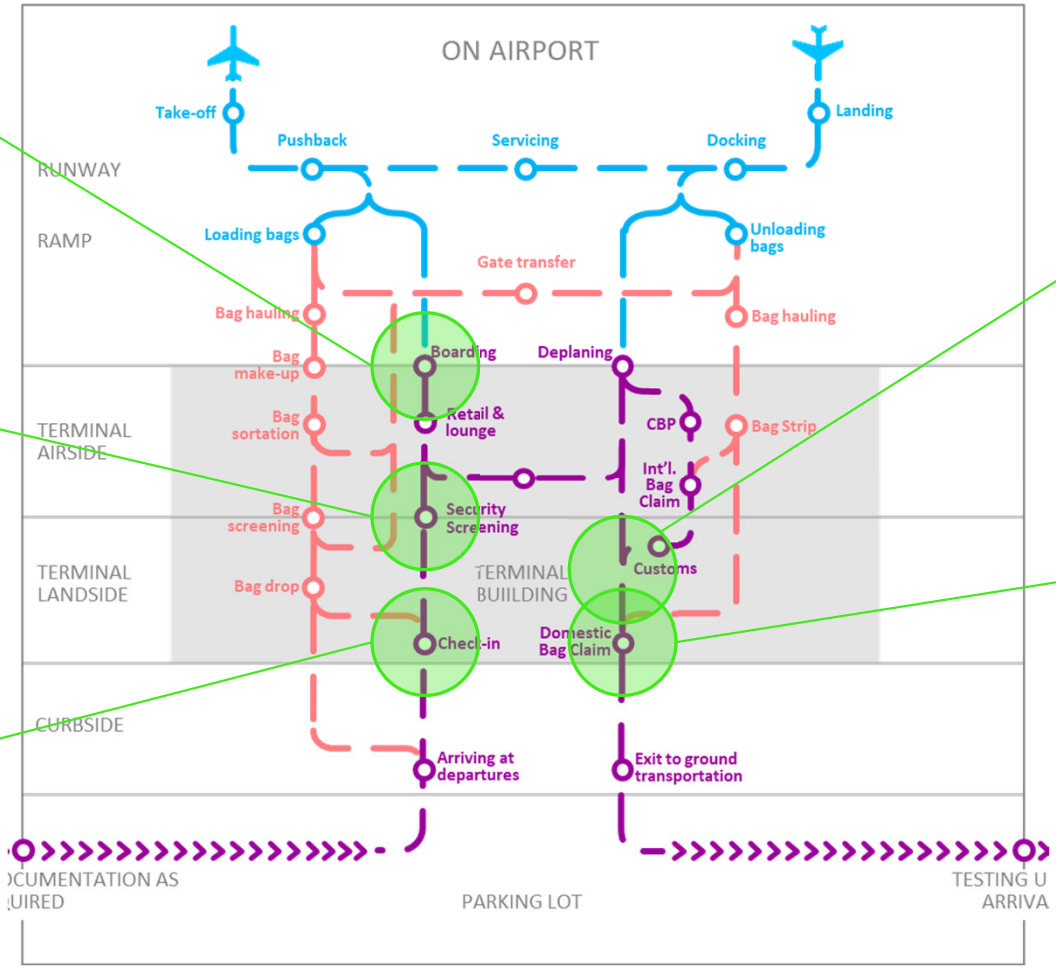
Journey Mapping
Physical Distancing Impacts

Signage/Holdroom Queuing

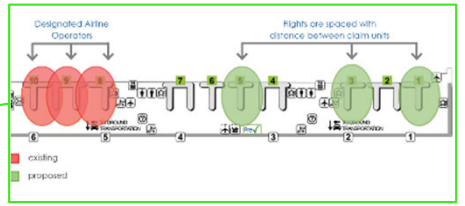
Barriers/Checkpoint Queuing



Queuing Options



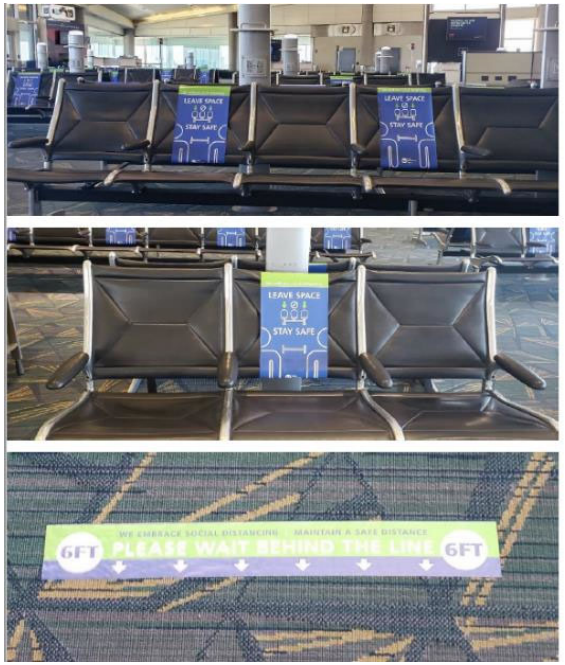
Heat Mapping – Crowd Density
Pilot Study #1

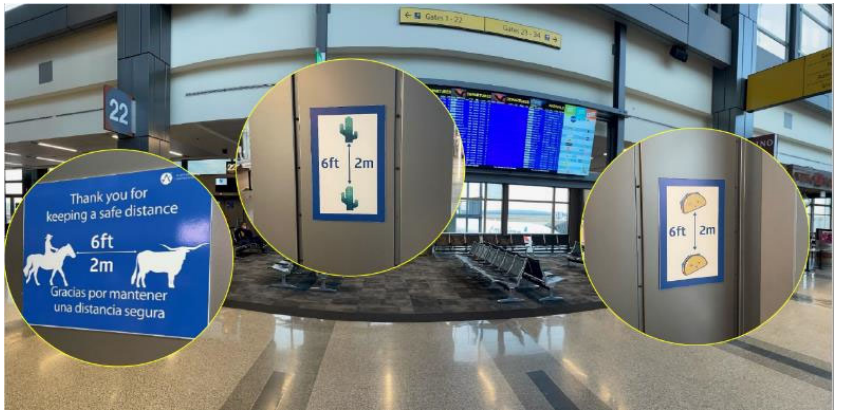


Baggage Claim - Flight Distribution
Pilot Study #2

Signage

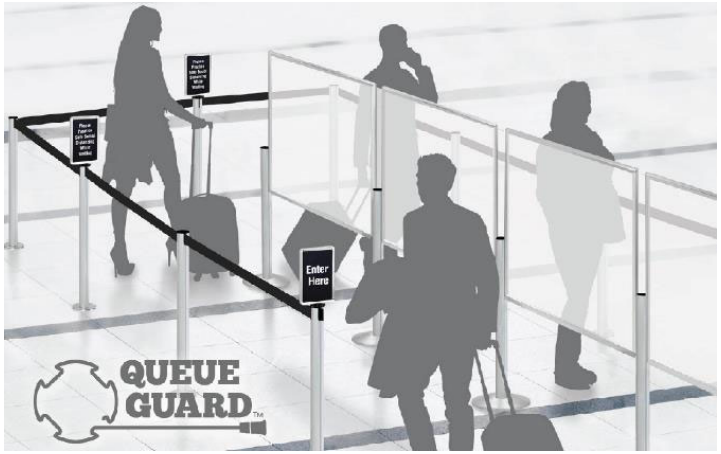
- Standards
- Visibility
- Clarity of Information
- Symbols/Language





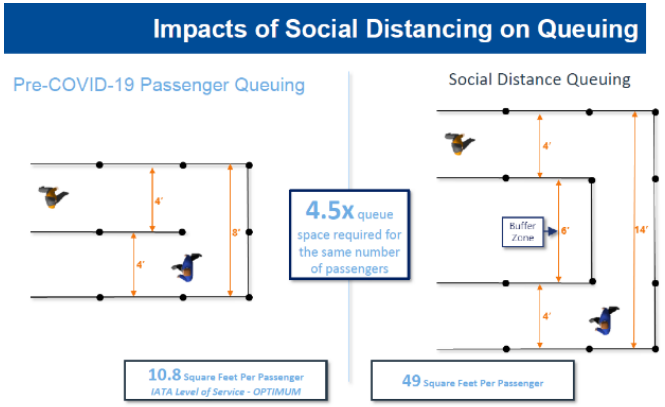
Barriers

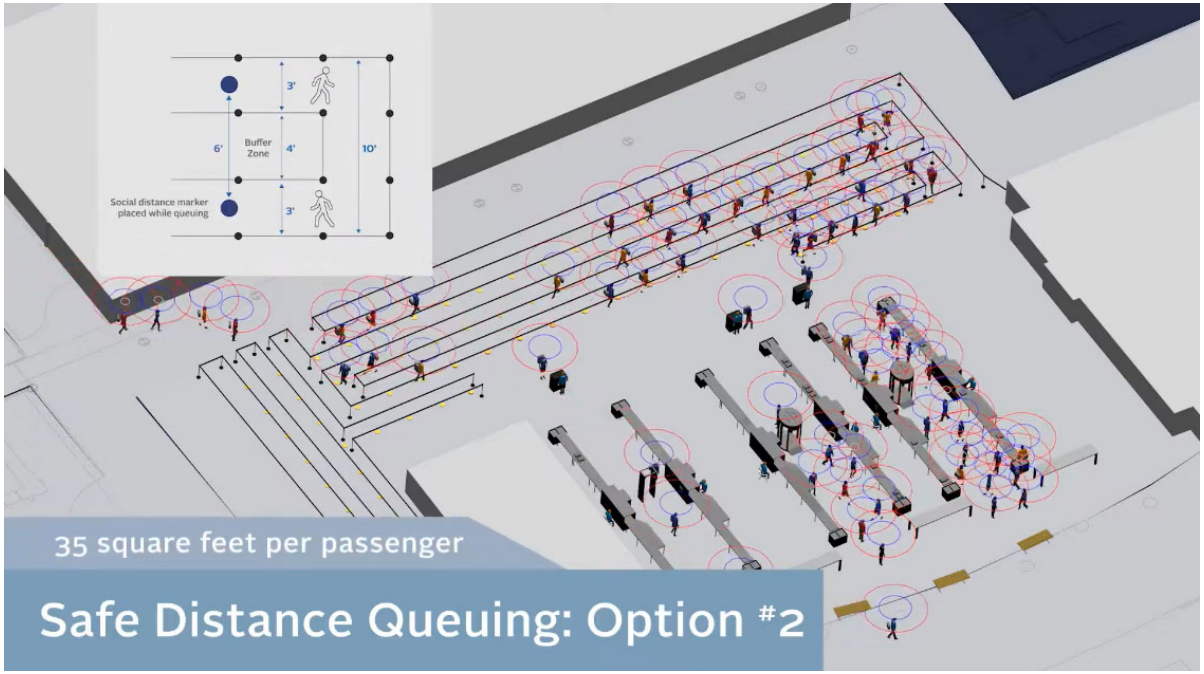
- Traveler Confidence
- Transparency
- Flexibility/Adaptability
- Experiential Approach
- Passenger Comfort
- Biophilia Opportunity



Queuing

- Safety for Passengers as well as Staff
- Spatial Impacts
- Entry/Exit Considerations





GUIDEBOOK:
TESTING FACILITIES

Testing Facilities

Executive Summary

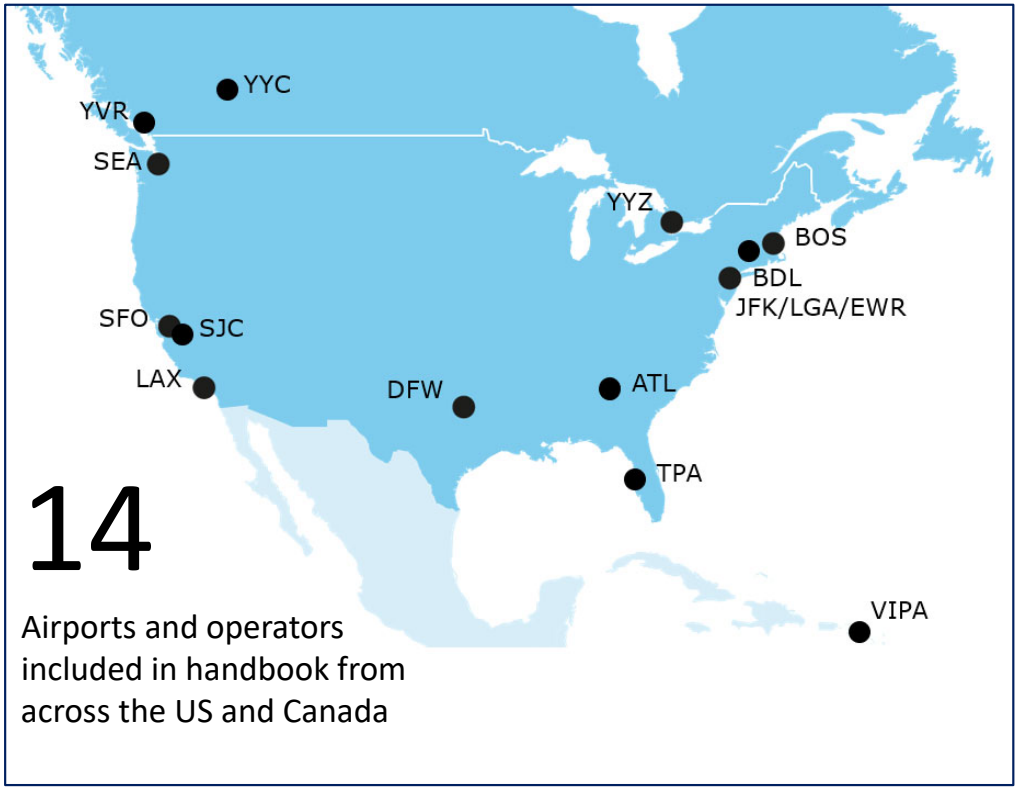
During January and February 2021, the terminal working group surveyed AAAE membership and trawled industry sources for examples of testing facilities in airports.

Fourteen examples have been collated which provide sufficient information to draw overall summaries and lessons learned from. These airports cover a range of airport sizes, traffic types and geographies across the US and Canada.

The information is provided in three levels of detail for ease of reference:

1. Summary of testing types, information ranges and lessons learned
2. Summary of the 14 examples tabulated for cross referencing
3. Detailed information of each example with layout information and lessons learned where available.

Due to the continuous evolution of this health event, the information is provided as a basis for further research. As such, information included was correct at the time of data gathering.



Location of 14 airport examples – Testing Facilities

Testing Facilities – Summary of Test Types

PCR TEST
(13 LOCATIONS)

PRE-SECURITY

24 – 72 hrs

$75 - $176

SEATAC OFFERS A RAPID PT-PCR TEST WITH RESULTS IN AROUND AN HOUR AT A PREMIUM COST OF $349 (NOT INCLUDED IN THE ABOVE SUMMARIES)

PCR NAAT TEST
(3 LOCATIONS)

PRE-SECURITY

15 mins – 36 hrs

$90 - $261

SPECIFICALLY FOR TRAVEL TO HAWAII, AIRLINES PARTNER WITH HEALTH PROVIDERS FOR PASSENGERS. THE COST INCREASES AS TIME FOR A RESULT DECREASES

ANTIGEN TEST
(10 LOCATIONS)

PRE-SECURITY (7)
POST-SECURITY (3)

15 – 60 mins

$80 - $200 (pre-sec)
$150 - $250 (post-sec)

POST SECURITY SITES ARE AIMED AT SPECIFIC FLIGHTS (e.g., KLM) OR ARE A PREMIUM SERVICE. DELTA HAS SITED A TESTING CENTRE IN THEIR SKYCLUB AT SEATAC

Testing Facilities – Summary of Lessons Learned

The information gathered across the example airports included lessons learned. These were mainly gathered around three main topics; Legal & Liabilities, Passenger Confidence, and Layout & Scalability.

Legal & Liabilities

- Liability issues need to be fully understood and signed off
- Third parties used to reduce liabilities
- Easier and quicker to bill customer direct
- What happens when a passenger from out-of-town tests positive? Need local partners
- Contact tracing is imperative

Passenger Confidence

- Use a reputable provider to instill passenger confidence
- Passengers prefer rapid testing, but this has credibility issues (YYZ trial)
- Regular review of the operation is needed to make sure it is meeting the goals
- Communication is important – preregistration reduces time, increases throughput and informs customers

Layout & Scalability

- Current locations are often in terminal but how can this be accommodated when passengers return?
- Work through location and procedure to get positive tested passengers out of the building
- Signage strategy is key, ensure sufficient space for surges and wheelchair assist
- Flexibility for future changes to requirements/higher volumes

Testing Facilities – Summary (1 of 2)

Airport	Location of testing (LS / AS / Off Airport)	Type of Test Available	Time for Test	Who administers	Who enforces the test?	Cost of Test
ATL	Landside	Rapid PCR Rapid Antigen		Contract Medical Staff	Delta Airlines	
BDL	In-terminal & Drive- thru	PCR swab	72 hours	Medical staff (Genesys)	Airline/airport	$125
BOS	Landside – Terminal C, Terminal E	PCR, Nasal Swab, Blood Antibody test	15 mins	Medical personnel from XpresCheck		PCR, Blood Anti-body - $75 Abbot Rapid ID - $200
DFW	Onsite Clinic post security @ Terminal D offered by AA (to Hawaii & employees only)	Rapid PCR	15 mins (Rapid Testing)	DFW Staff	Airport	$150 (At CareNow Clinic) $249 (At Airport)
JFKIAT	Arrivals Hall Secure side Trial – transferring to AMS	Abbott ID molecular NAAT, PCR, Antibody test	30-45 mins (NAAT)	XpressCheck	Airlines	
LAX	Landside – CTA opposite T6 TBIT & T2 departures	Rapid PCR Rapid Antigen	3-5 hours 30-60 mins	3rd Party Vendor (ClarityLabs)	Dept: Airlines Arr: CDC	$125 (PCR) $80 (antigen)
LAX	Landside – T2 Entrance Airside – Arr corridor (Gate 150)	Thermal Temperature (Pilot)		Medical Staff (CDC), Airport Staff		N/A for passengers (Cameras + analytics package cost $46,500 - $71,500)
SEA	Landside on mezz above ticketing Airside near Gate S10 for AMS flights only	PCR Next-day result PCR SWAB (15mins results)	15 mins to a day	Medical professionals	Airlines	$250 POC Antigen (AMS) $150

Testing Facilities – Summary (2 of 2)

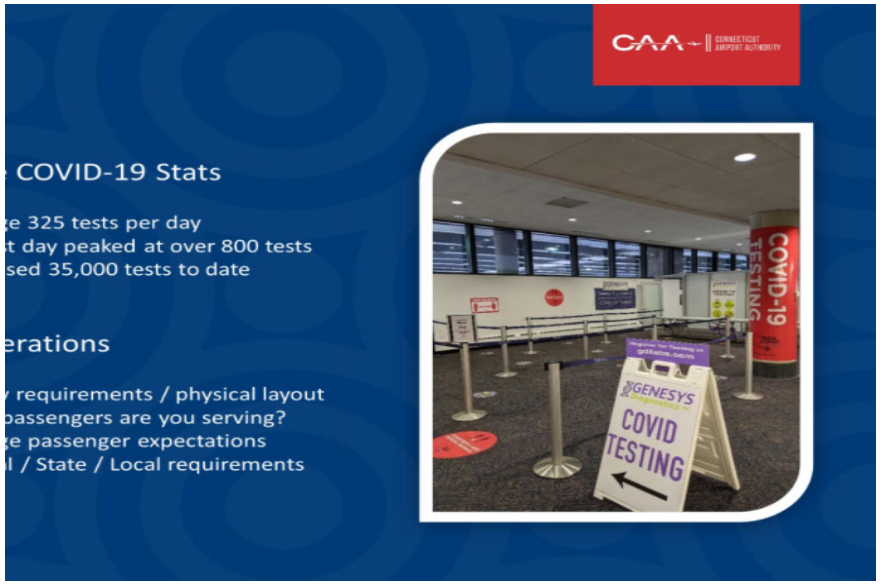
Airport	Location of testing (LS / AS / Off Airport)	Type of Test Available	Time for Test	Who administers	Who enforces the test?	Cost of Test
SFO	Landside - outdoors in courtyard A	COVID 19 Abbot ID now (molecular test)	15 mins			Employees - $191 Passengers - $261
SJC	Landside	NAAT	1 day	Carbon Health Worksite Labs	State of Hawaii	
TPA	Landside -Main Terminal	PCR Rapid Antigen	PCR (48 hours) Rapid Antigen (15 mins)	BayCare Medical professionals	Airlines, Airport	PCR ($150) Rapid Antigen ($60)
VIPA	Nasal and Swab (thermal temp check at terminal entrance)	Public		Virgin Island DOH	Virgin Island DOH	
YVR	Curbside – within container (voluntary)	Rapid Antigen & PCR	35mins (20 mins enrollment, 15 mins results)	Registered nurse	Airlines confirm a negative test (voluntary)	
YYC	Arrivals testing Check in (only for KLM) Security temp check	PCR swab Blood serology NAAT	48 hours	Medical staff	Airline/Airport CBSA on arrivals,	$150 - $175 CAD
YYZ - Departures	Landside	Rapid PCR/Antigen	15-20 minutes	National Research Council Canada, LuminUltra (Rapid PCR) and Panbio (Rapid Antigen)	Airport, CBSA, Airlines	
YYZ - Arrivals	Landside – Meeters & Greeters Hall	PCR	24 – 48 hours	Switch Health Labs	CBSA upon arrival at YYZ	

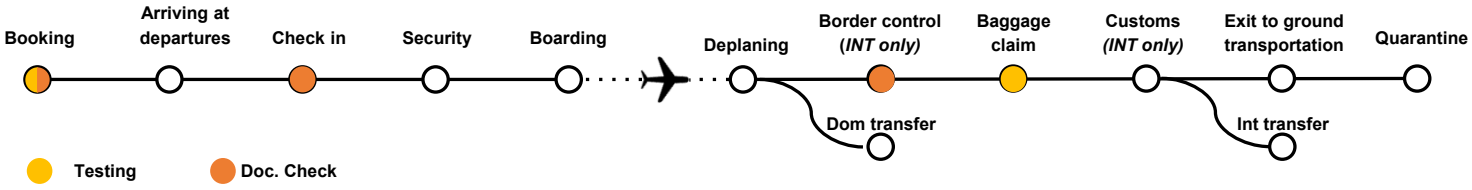
Testing Facilities – Bradley International Airport (BDL)

Airport	Location of testing (LS / AS / Off Airport)	Type of Test Available	Time for Test	Who administers	Who enforces the test?	Cost of Test
BDL	In-terminal & Drive- thru	PCR swab	72 hours	Medical staff (Genesys)	Airline/airport	$125

Lessons Learned

- Set clear and realistic expectations for passengers about the tests. When tests are available in 24-72 hours, tell people within 72 hours.
- Preregistration is important. This can be pre-loaded in the process. As passengers arrive at the testing site, all the information is prepopulated and allows pax to get in and out within 2 mins.
- Have a plan for back up spaces –what happens when the queue becomes stressed.
- Realize upfront the sense of urgency behind getting the test will vary between persons.
- Make sure that your plan is fluid so that you can adapt the planning if local regulations do shift.



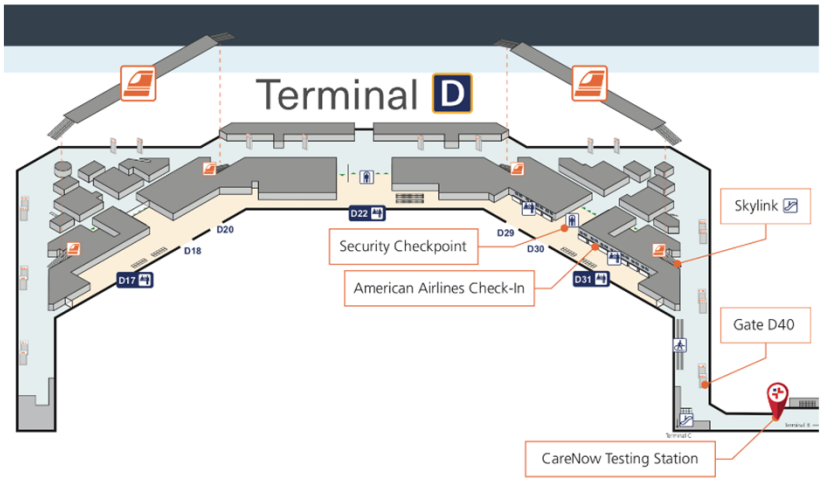


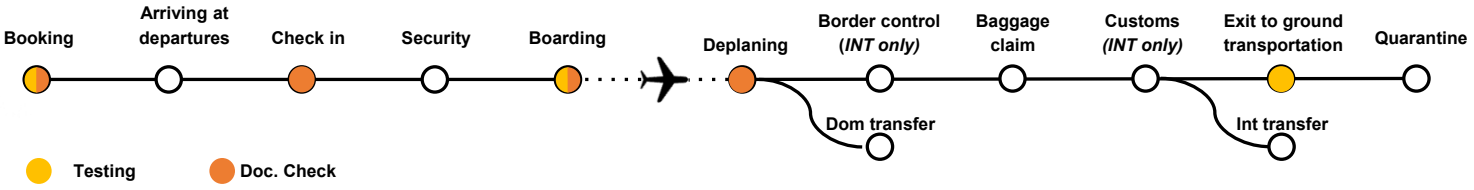
Testing Facilities – Dallas Ft Worth (DFW)

Airport	Location of testing (LS / AS / Off Airport)	Type of Test Available	Time for Test	Who administers	Who enforces the test?	Cost of Test
DFW	Onsite Clinics Terminal D- airside (employees & select AA flights only)	Rapid PCR	15 mins (Rapid Testing)	DFW Staff	Airport	$150 (At CareNow Clinic) $249 (At Airport)

American | CareNow

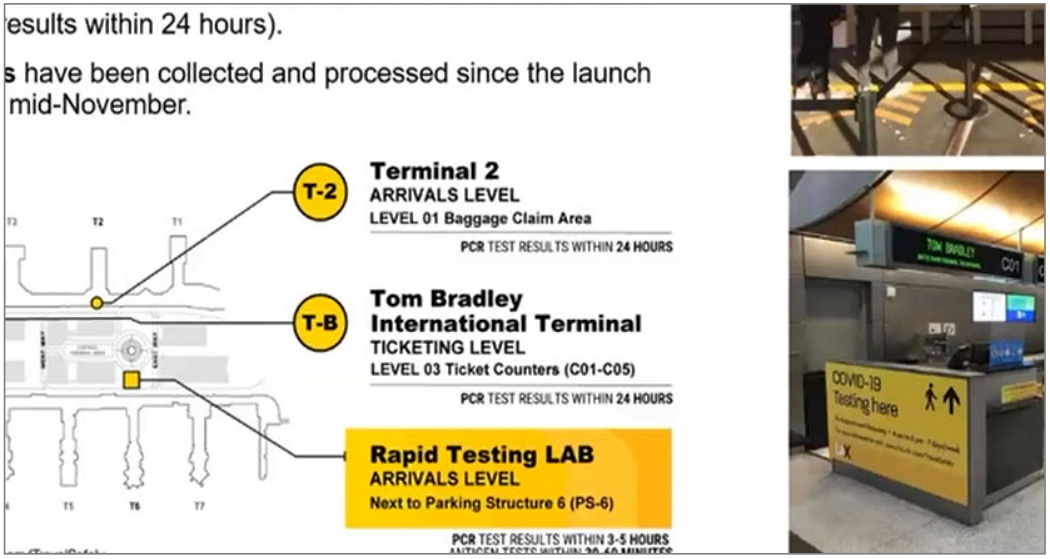
Testing for select flights

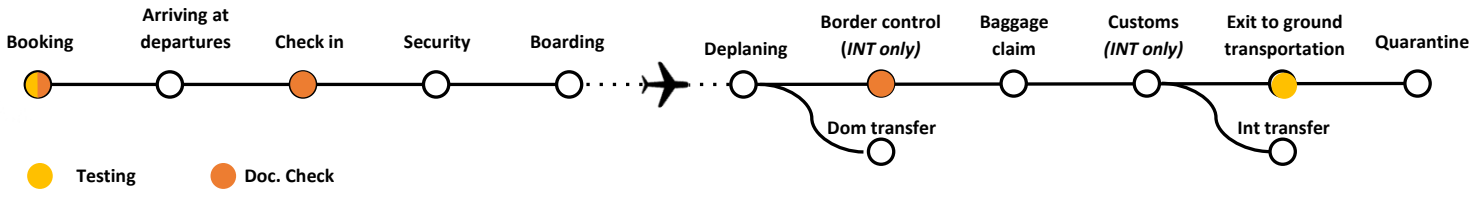




Testing – LAX

Airport	Location of testing (LS / AS / Off Airport)	Additional Collection points	Type of Test Available	Time for Test	Who administers	Who enforces the test?	Cost of Test
LAX	Landside – CTA opposite T6 TBIT & T2 dep	Rapid PCR Rapid Antigen	3-5 hours 30-60 mins	3rd Party Vendor (ClarityLabs)	Dept: Airlines Arr: CDC	$125 (PCR) $80 (antigen)	LAX



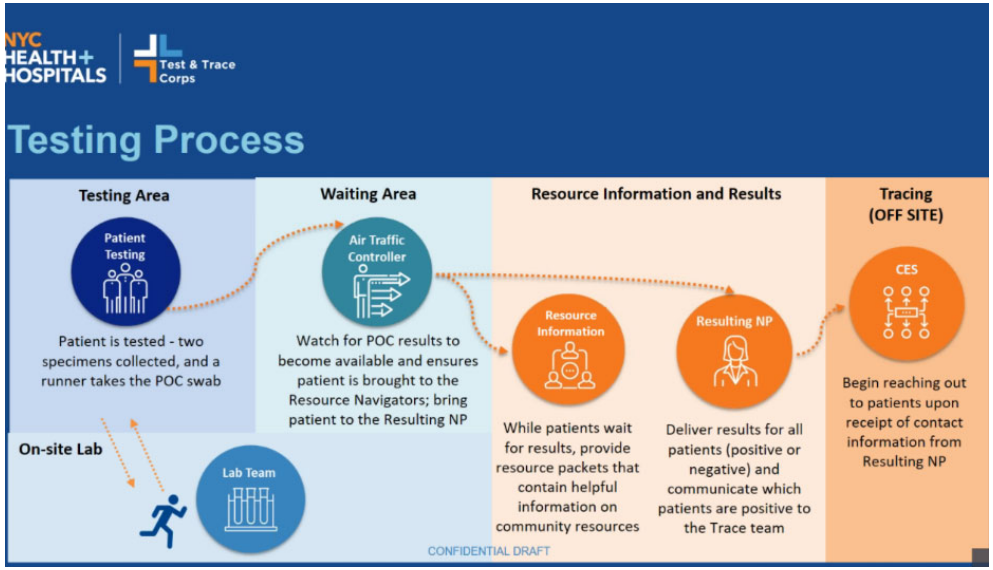


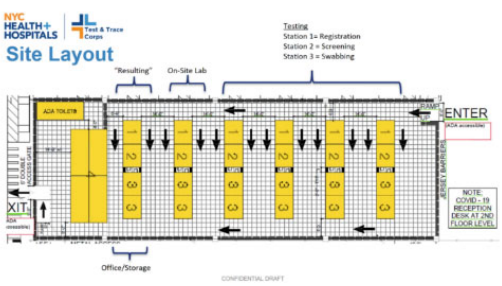
Testing Facilities – Port Authority of New York & New Jersey

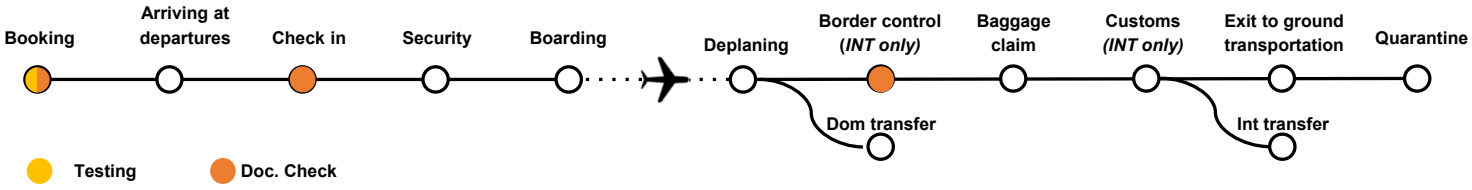
Airport	Location of testing (LS / AS / Off Airport)	Type of Test Available	Time for Test	Who administers	Who enforces the test?	Cost of Test
PANYNJ 's JFK / LGA / Newark	Pre-security and/or curbside at parking lots	Rapid Antigen & PCR	Up to 5 days	Registered nurse	Airlines confirm a negative test(voluntary)	Free

Lessons Learned

- Wanted the testing to be overseen by medical supervision. Takes liabilities out of the hands of the airports.
- In addition to coordinating with the airlines, local health department, there is further complications with coordinating with the airport sponsors – setting clear standards will therefore become increasingly important.
- Contact tracing is important – it is difficult to get people staying on the testing site (especially if they are trying to catch a flight).





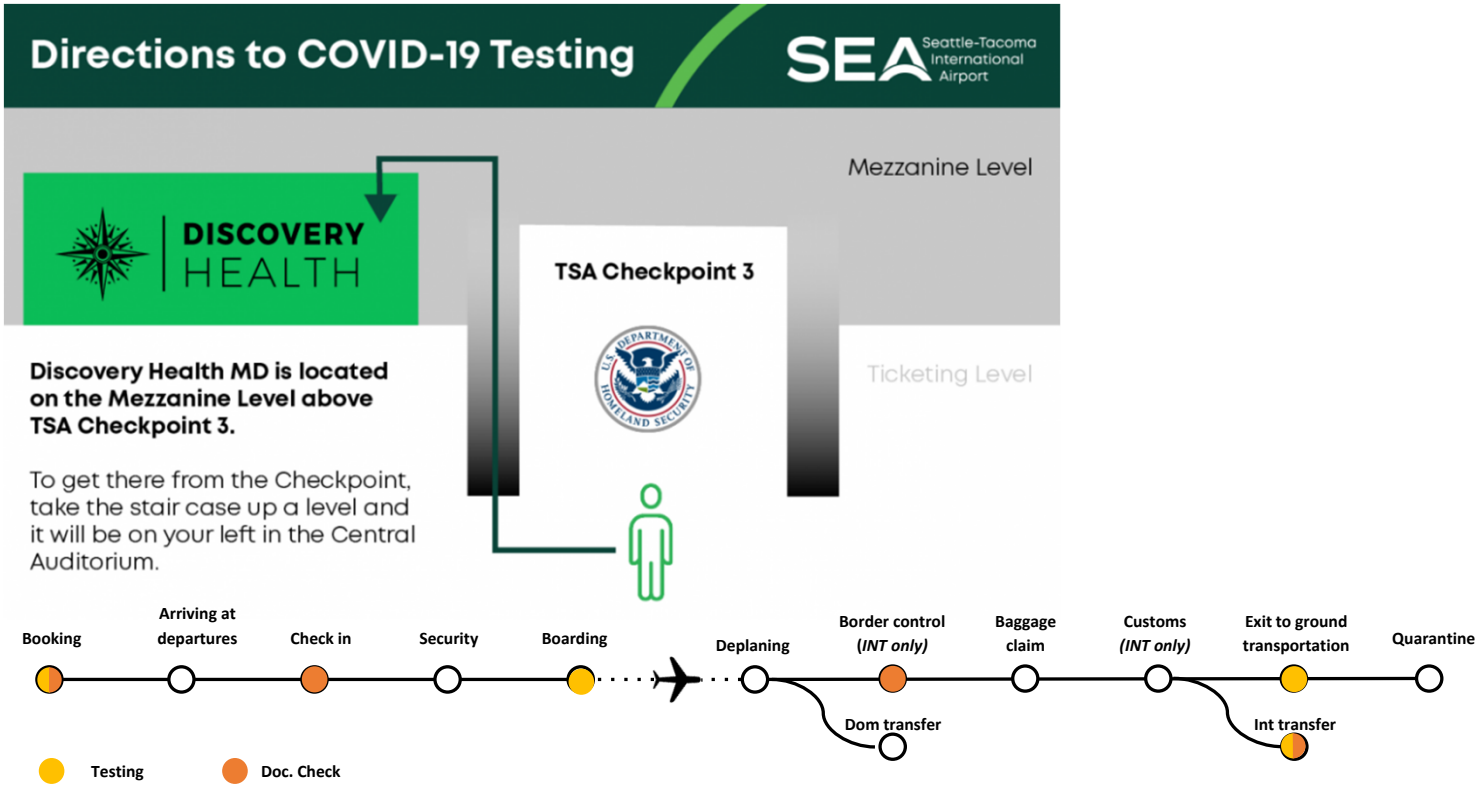


Testing Facilities – Seattle-Tacoma International Airport (SEA)

Airport	Location of testing (LS / AS / Off Airport)	Type of Test Available	Time for Test	Who administers	Who enforces the test?	Cost of Test
SEA	Landside on mezz Airside near Gate S10 for AMS flights only	PCR Next-day result PCR SWAB (15mins results)	15 mins to a day	Medical professionals	Airlines	$250 POC Antigen (AMS) $150

Lessons Learned

- Make sure that the legal team are across the liability issues – ensure that the vendor has documented pax sign off and ensure that they will not board with a positive test. (Domestic carriers don't want liability of positive pax on board, current debate of who is responsible for pax).
- Though passengers prefer rapid testing, there is concern that rapid testing has credibility issues based on military charter testing in flight. (20% of the flight is tested and 6-10 came back positive).
- Airport planning and modelling helped setting up the location of testing site. Permanent site wants to be outside the airport terminal. It is now near bag claim area because its easy to direct positive travelers out of the terminal quickly.



Testing Facilities – San Francisco (SFO)

Airport	Location of testing (LS / AS / Off Airport)	Additional Collection points	Type of Test Available	Time for Test	Who administers	Who enforces the test?	Cost of Test
SFO	Landside – CTA opposite T6	In TBIT and T2 departures	Rapid PCR Rapid Antigen	3-5 hours 30-60 mins	3rd Party Vendor (ClarityLabs)	Airlines	

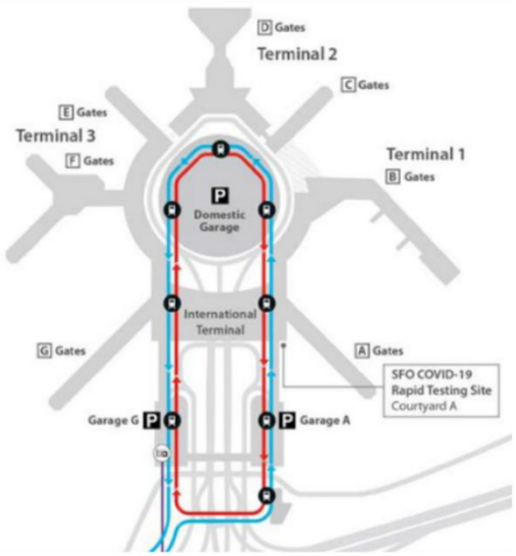
Lessons Learned

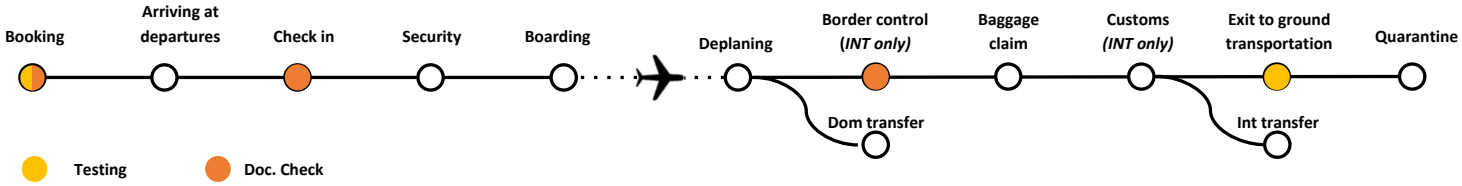
- Extending tests from just employees to travelers to Hawaiis resulted in 70% LF in Hawaiian flights compared to the 50% LF across the airport. This shows that leisure travel can pick up relatively quickly once the testing protocols are met.

- "Positive passenger management consequential plan" developed as a protocol for when travelers get tested positive and are unable to travel according to CDC guidelines, and the local county is limited in housing capacity. Airport works with air carriers to shut down boarding pass of positive passenger and works with CDC & TSA for remaining protocol.

The Test

- COVID-19 Abbott ID NOW™
- Abbott received emergency use authorization (EUA) from the U.S. Food and Drug Administration (FDA) in March 2020.
  - A molecular test
  - Detects COVID-19's nucelic acid through nasal/nasopharyngeal swabs
  - Isothermal Amplification (IA)
  - ≥ 94.7% in positive agreement (sensitivity)
  - ≥ 98.6% negative agreement (specificity)
- Administered by medical staff from GoHealth Urgent Care
- Results in 15 minutes or less



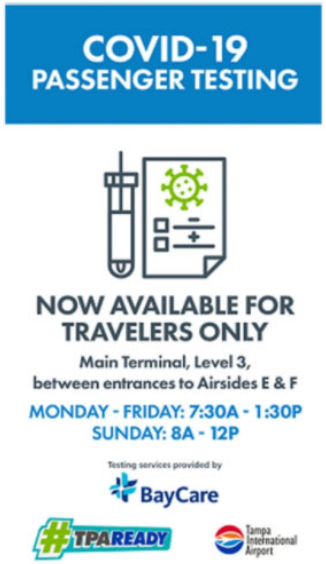


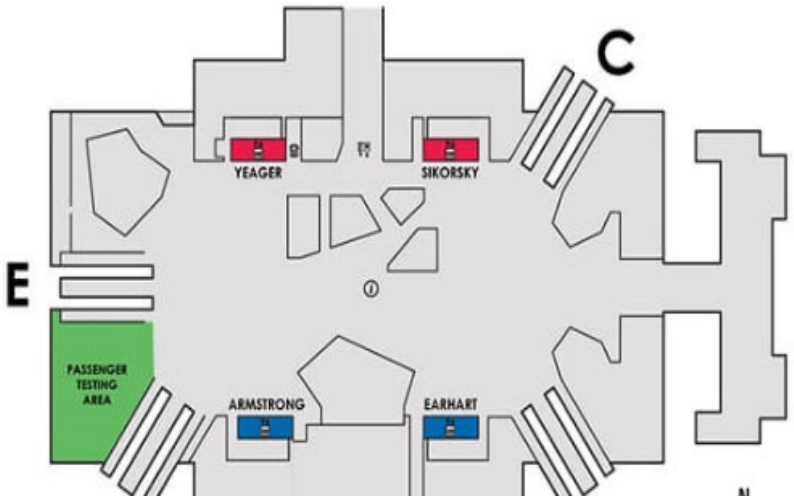
Testing Facilities – Tampa International Airport (TPA)

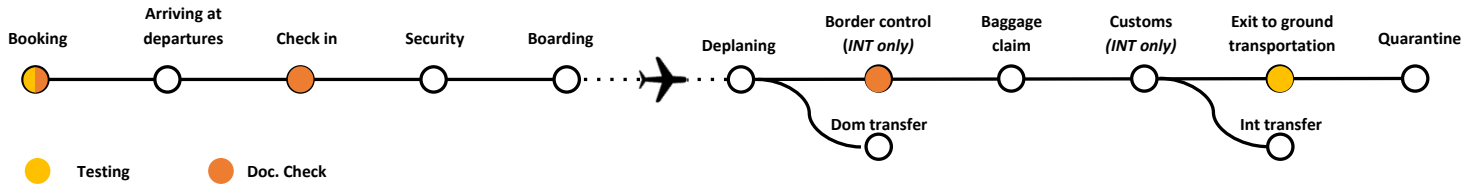
Airport	Location of testing (LS / AS / Off Airport)	Type of Test Available	Time for Test	Who administers	Who enforces the test?	Cost of Test
TPA	Landside -Main Terminal	PCR Rapid Antigen	PCR (48 hour) Rapid Antigen (15 mins)	BayCare Medical professionals	Airlines, Airport	PCR ($150) Rapid Antigen ($60)

Lessons Learned

- People want and are grateful testing is available at the airport - a centrally located facility where it is easy access. People also liked that the medical provider was reputable locally - this instilled passenger confidence.
- Early on, airlines had difficulties interpreting lab results. Working with airlines to the standardization of test results in the long term is important.
- Customer service being in the responsibility of the medical provider takes the responsibility out of airport's hands.
- Facility does not bill insurance (prevent slow down of the throughput and to prevent the complications where passengers get billed back weeks later and denying claims when asymptomatic).





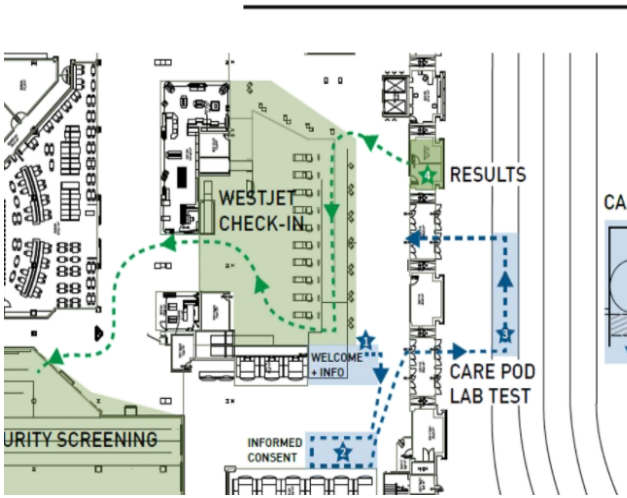


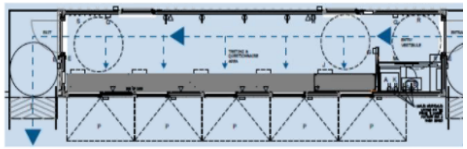
Testing Facilities – Vancouver International Airport (YVR)

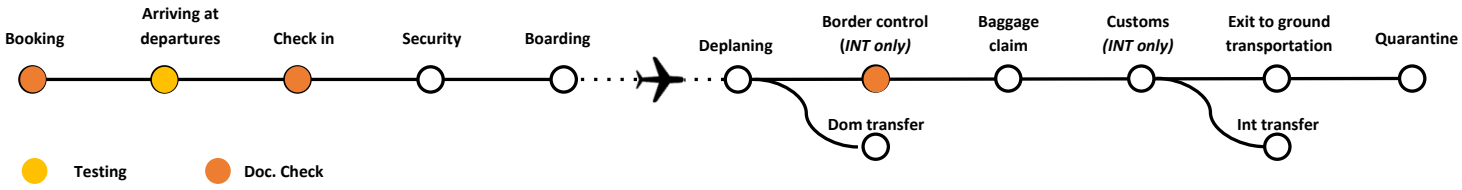
Airport	Location of testing (LS / AS / Off Airport)	Type of Test Available	Time for Test	Who administers	Who enforces the test?	Cost of Test
YVR	Curbside – within container (voluntary)	Rapid Antigen & PCR	35 mins (20 mins enroll, 15 mins results)	Registered nurse	Airlines confirm a negative test (voluntary)	

Lessons Learned

- For those who underwent, acceptability was very high. People didn't find the nasal swabs too uncomfortable.
- Rapid tests take at least 15 mins to process results. Pre-registering passengers at booking can reduce 20 mins of process time for enrollment and informed consent.







Testing Facilities – Calgary International Airport (YYC)

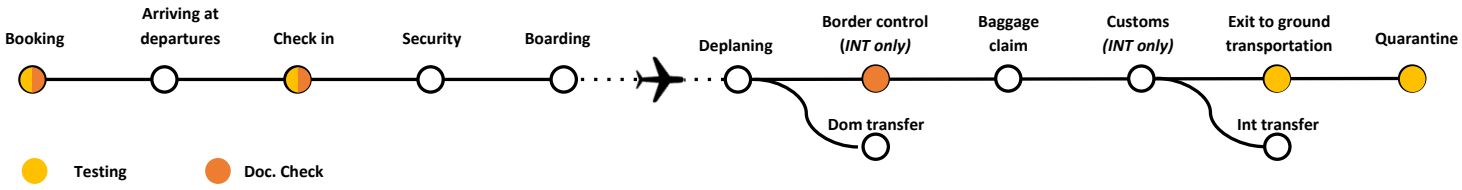
Airport	Location of testing (LS / AS / Off Airport)	Type of Test Available	Time for Test	Who administers	Who enforces the test?	Cost of Test
YYC	Arrivals testing (2 tests) Check in (only for KLM) Security temp check	PCR swab Blood serology NAAT	48 hours	Medical staff	Airline/airport CBSA on arrivals,	$150 - $175 CAD

Lessons Learned

- Signage is important to direct spill over passengers and manage queues.
- Scalability - looking into other potential areas to move the testing out of the airport when passenger capacity begins to increase, maybe at the hotel or convention center.
- Connecting passengers - connecting passengers must go to the arrivals testing facility and then loop back to their boarding areas. Dangers with queuing times and passengers could miss their connecting flights.
- Accessibility - Holdups due to the people pushing the wheelchair and staff requirement – must take this into consideration.

Calgary INT Airport – Andy Davis

- Testing at arrivals only, available to international travelers
- Arr testing reduced quarantine time by 12 days if result is negative. A follow up test from the drug store 6 days after the first result is required.
- Testing capacity: 500 tests/ day
- 5 to 6 mins transaction time (3 mins registration). The tests were taken to the University of Calgary and results were available in a day.

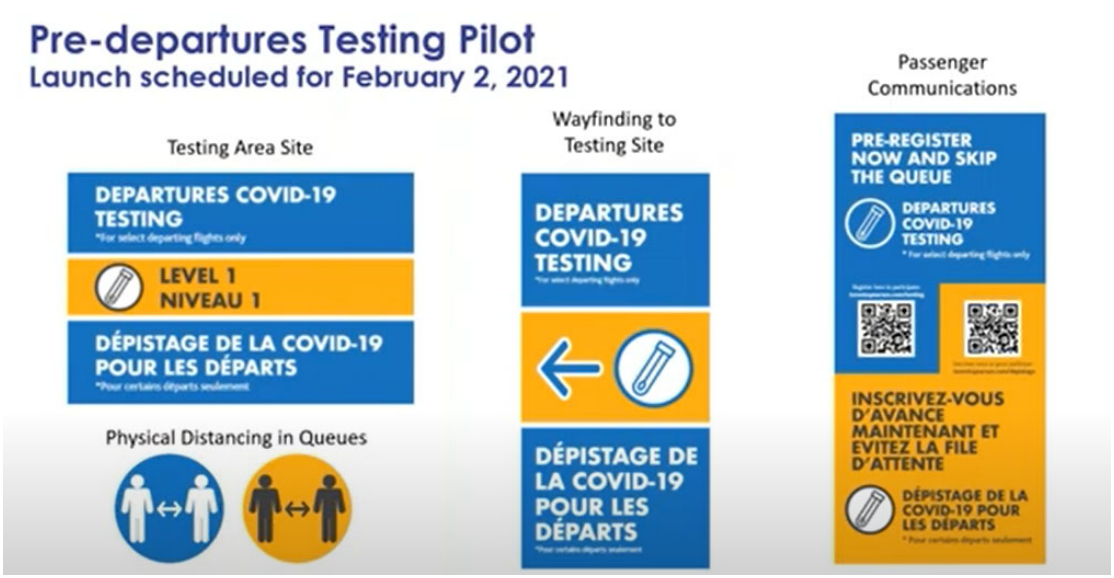


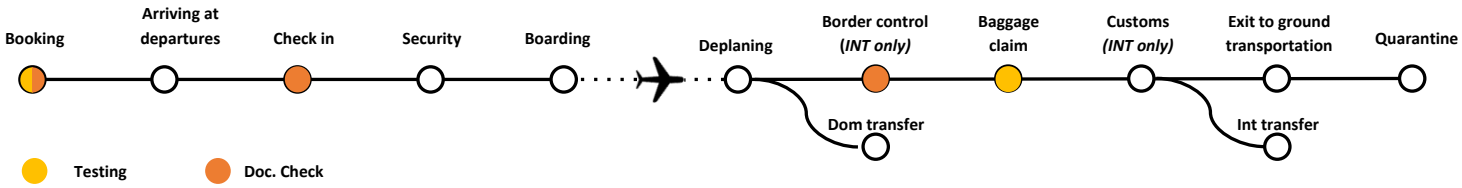
Testing Facilities – Toronto Pearson (YYZ)

Airport	Location of testing (LS / AS / Off Airport)	Type of Test Available	Time for Test	Who administers	Who enforces the test?	Cost of Test
YYZ	Landside	Rapid PCR Antigen	24 – 48 hours	Switch Health Labs, National Research, LuminUltra and Panbio	Airport, CBSA, Airlines	

Lessons Learned

- Short to medium term trying to provide robust 72 hour window with PCR test. Can be accommodated with current low volumes in the long term, antigen test at front of house is desirable (cost and scope) – don't want the testing in the terminal to impact existing environment.





GUIDEBOOK: DOCUMENT CHECK

Document Check

Executive Summary

This section details examples of document checking that has been integrated into operations at US and Canadian airports.

The section includes a summary table of examples for quick reference showing key information across the airports reviewed.

Travel Health Apps – Summary (1 of 2)

App name	Agencies Involved	Airline
VeriFly	DEN	American Airlines
		British Airways
Common Pass	US CBP CDC Common project Foundation World Economic Forum	JetBlue
		Lufthansa
		Swiss
		United Airlines
		Cathay Pacific
		Virgin Atlantic
		British Airways
IATA Travel Pass **(IATA Timatic for lab verification)**	International Airlines Group Testing Organizations	Emirates
		Qatar
		Etihad
		American Airlines
		Singapore Airlines
		British Airways
		Copa Airlines
		RwandaAir

Travel Health Apps – Summary (2 of 2)

App name	Agencies Involved	Airline
ArriveCAN	Public Health Agency of Canada Transport Canada CBSA	
AOKpass	International Chamber of Commerce	Etihad
		Alitalia
CLEAR	State of Hawaii	Delta Airlines
		United Airlines
CoronaPass	HM Government in the UK	
Mvine-iProov Passport	Directors of Public Health (NHS) in the UK Department of Homeland Safety	
Green Passport	Israel's Ministry of Health	
Covid Credentials Initiative (CCI)	Linux Foundation Public Health	
V-Health Passport	John Lennon Airport Newcastle Airport VST Enterprise	
YOTI	Government of Jersey Heathrow Airport NHS	Virgin Atlantic
IBM Digital Health Pass	National Institutes of Health US Department of Health & Human Services	
Ink Digital Health Platform	Tento Health (Spain)	

Document Check – Summary

Airport	Location of check (Arr / Dep / Secure)	For Domestic or International travel?	Purpose of check? (protecting community, destination, or airport)	Who does the check?	Type of check	Is technology used?	If yes, Type of Apps used?
ATL	Dep - At the gate Arr - On the Jet Bridge	Just Int		CDC	Arrival declaration form	No	
DFW	Dep: Some carrier at check-in Int Arr: within vestibules / secure corridors before CBP	INT arr only	Community, airport	Airlines, (AA for Hawaiian flights). Arrival: CDC contracted staff	Checking testing documents	No	
JFKIAT	Dep - trial facility on the secure side Arrivals	Where required	Airport, destination, community		NYS require health declaration to be provided to NY Health Dep		
LAX	Dep - Check-in Arr –Deboarding	Int - yes Domestic - just temperature check	Domestic - Community & Airport	CBP	Manual forms QR codes on mobile phones	Some pilots	CommonPass
SEA	Dep: Landside Transfer: Sterile corridor Arr: Deboarding	Int - only for Netherlands				No	
SJC	None	None	None	None	None	No	
VIPA	Arrivals Hall (Prior to exiting bag claim)				Health declaration forms	No	
YYC	Arrivals CBSA	Both		Customs officers	ArriveCAN app form.		
YYZ	Airlines at upline station, CBSA at YYZ with PHAC assisting	International Arrivals		Departure; check-in and/or gate Arrivals; Primary Inspection Area		Not currently	

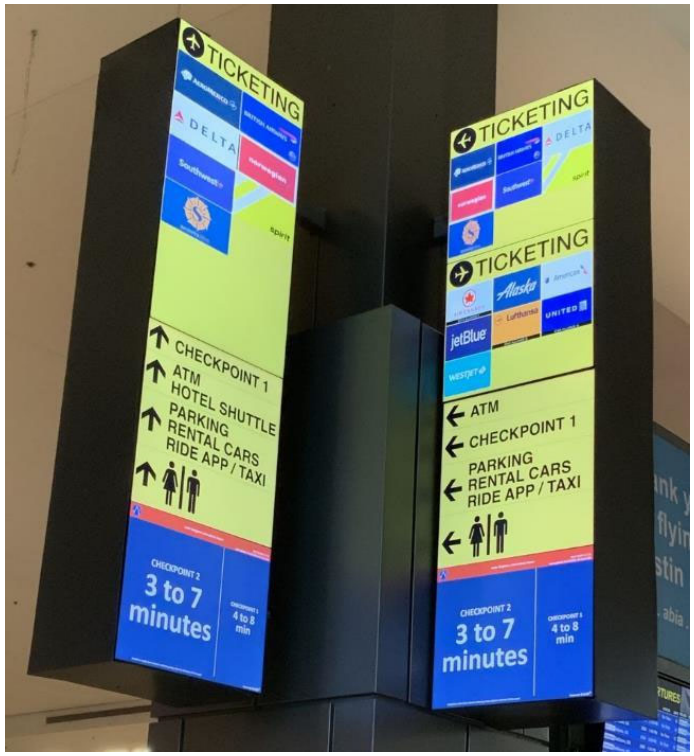
PILOT PROJECTS: PHYSICAL DISTANCING

Physical Distancing – Heat Mapping

Concept

The Pandemic presented many challenges in the airport environment and in some respects, the challenges were familiar to those faced pre-pandemic. The similarity was the density of people in a limited space. Even though there were fewer people, the imposed 6 feet separation caused similar issues to capacity related issues experienced pre-pandemic. In order to address capacity related issues some airports developed systems to alert a Passenger (PAX) of alternate options. By providing anticipated checkpoint wait times, PAX now had options which allowed for some dispersal to reduce the density at chokepoints. This system used a combination of Wi-Fi, Bluetooth, and cameras.

The concept of Heat Mapping of the Terminal was born from this concept. Giving PAX options within the Terminal, giving the PAX control and understanding of their situation and surroundings.



Physical Distancing – Heat Mapping

Benefits to the Terminal

- Resource Allocation/Alerts
  - Proactive vs Reactive
- Customer Experience

Public Outreach (Promote Safe Travel) Long Term

- Predictability
- Flexibility
- Asset Management

Level of Effort

- IT (Medium)
- Security (Low)
- Operations (Low)

Description of Concept

- Public facing output to provide PAX information and options based on heat map output related to physical distancing.

Objectives

- Utilize existing infrastructure to evaluate effectiveness of technology to promote physical distancing through mapping, alerts, and announcements.

Cost/Timeframe

- Resources/Weeks

Physical Distancing – Heat Mapping

Benefits to the Terminal

The data captured can be utilized by operations to be proactive rather than reactive. Live data and analytics can be utilized to allocate staff and assign resources. Incorporating Artificial Intelligence (A.I.) software along with flight information would allow for further predictive control and could potentially be tied to building automation systems for energy savings.

The system can be used for Public Outreach (Promote Safe Travel) and Long Term offers the following benefits.

- Predictability
- Flexibility
- Asset Management
- Improved Customer Experience

Description of Concept

Utilize existing and supplemental infrastructure to evaluate effectiveness of technology to promote physical distancing through mapping, alerts, and announcements.

- Existing infrastructure, HTML, and Apps used to portray real time density heat maps of locations within the facility. This provides options for PAX. The PAX is able to determine, prior to entering the terminal, which checkpoint to utilize and where to go after screening.

Description of Concept

Public facing output to provide PAX information and options based on heat map output related to physical distancing.

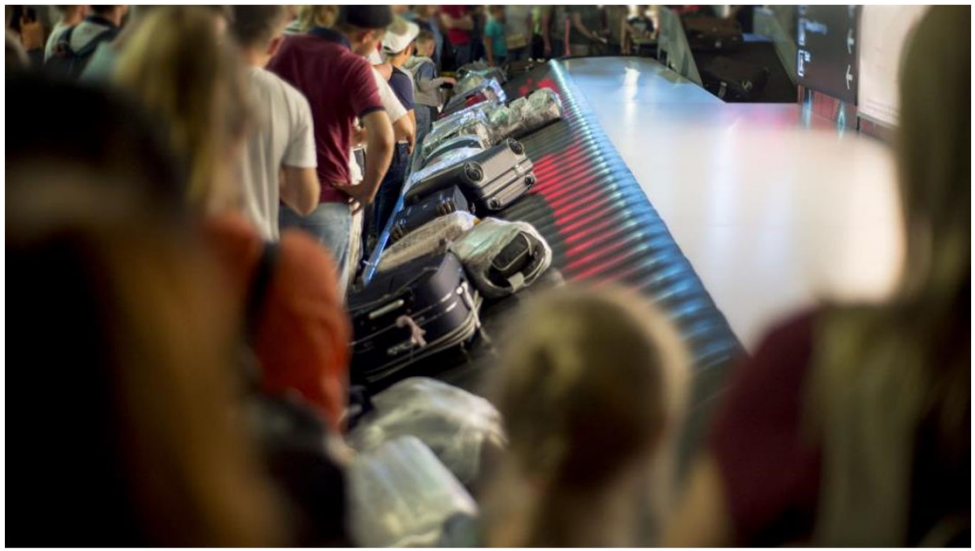
- Utilizing Cameras, Bluetooth, and Wi-Fi, PAX data is captured and displayed to depict current conditions, provide visual and/or audio cues to maintain physical distancing and provide PAX with alternate locations throughout the terminal that have less concentrations of PAX.

PILOT PROJECTS:
BAG CLAIM SPACING

Why Is this Important?

Common Issues

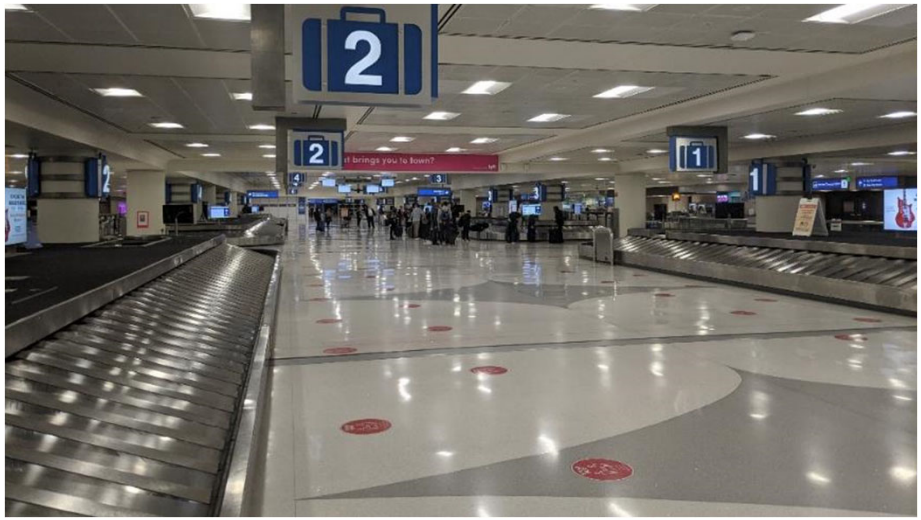
- Baggage claim is one of the first/last impressions arriving passengers have of your airport
- Claim systems have traditionally been simple systems to deliver all bags to passengers at a single point
- Passenger and Baggage Journey
  - Departing/outbound systems the focus
  - Inbound has historically been an afterthought. Once baggage arrives, the assumption is that it has left the airport



Physically Distanced Baggage Claim

Distributed Baggage Claim Concept

Instead of building barriers for passengers to occupy the same crowded situations, the **Distributed Claim Concept** uses existing equipment and infrastructure to naturally distribute the crowd across usable space.



- Distribute flights across the claim hall to provide spacing between claim operations
- Distribute bags from single flights across multiple claim devices to reduce the number of passengers

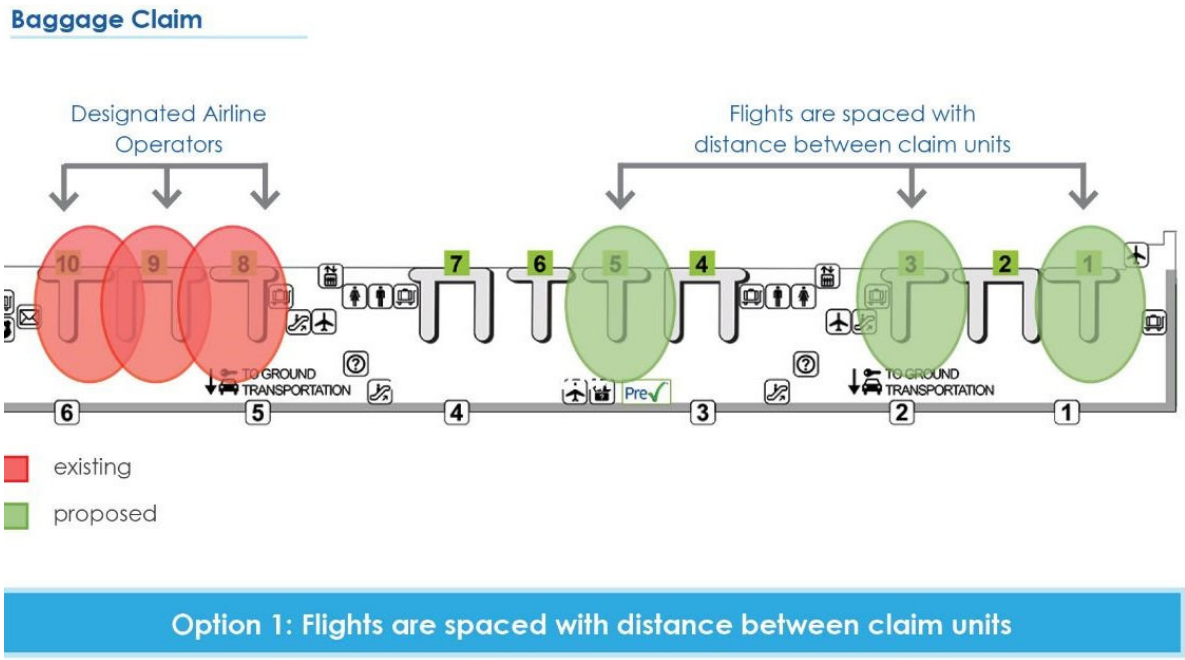
Option 1: Distributed Flights

Distribute Inbound Flights Throughout Claim Area

- Largest impact with centralized claim halls
- Potential implementation with minimal capital investment

Requirements

- Centralized claim hall or claim hall with multiple devices
- Flexibility for airline to use any device
- Operational volume low enough to not require all claims in operation



Option 1: Flights are spaced with distance between claim units

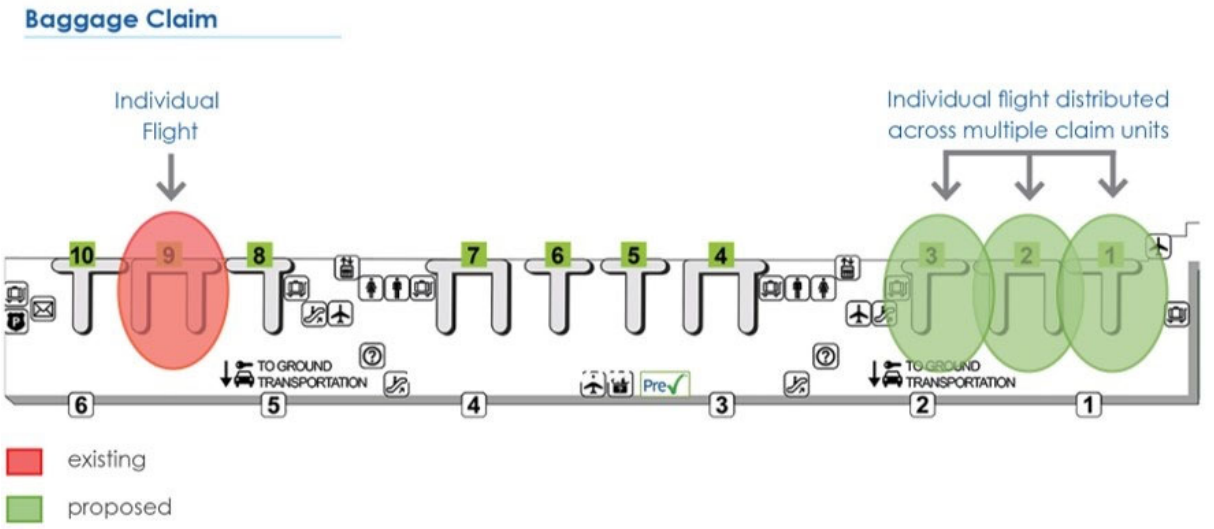
Option 2: Distributed Baggage Claim

Individual Flight Distributed Across Multiple Devices

- Baggage sortation at airplane or claim
- Possibility to separate priority passengers from general public passengers

Requirements

- At least two claim devices
- At minimum notification is provided by inbound claim operators at devices
- Operational volume low enough to support use across two claims, challenge during peak inbound traffic



Option 2: Individual flight distributed across multiple claim units

Distributed Claim Operations

Baggage to Designated claim Destinations

Benefits

- Convenience: Passengers use mobile app or arrive at notification system screen indicating which claim location to pick up bag(s).
- Reduces Bottleneck: Passengers arrive at their preferred/assigned claim devices at designated areas reducing passenger density, reducing wait time.

Standard Claim Operations

- Bag are loaded on to carts
- Bags are dropped onto inbound belts/devices
- Bags are delivered to designated claim

Distributed Claim Operations

- Bag tags are scanned as they are loaded on to carts
- Bags are dropped onto inbound belts/devices and scanned before they travel to claim hall.
- Bags are delivered to claim device by either **Distributed Flight** method OR **Distributed Baggage Claim** method.
- Notification system is updated to show **claim device destination**, as well as when bag is unloaded on device.

Improving the Passenger Journey

Baggage Sortation at Airplane Allows for Multiple Destinations

- Additional destinations could include:
  - Valet Parking
  - Rental Car
  - Hotel
  - Home
- Additional benefits to airport:
  - Fewer passengers and baggage in claim hall
  - Claim and claim hall square footage could (potentially) be reduced
  - Existing claim halls could repurpose areas

Improved Passenger Level of Service

- Baggage delivered to other destinations provides improved Passenger Level of Service
- Providing estimated time and location of bag to claim device allows passengers to arrive at certain areas at designated times, reducing wait time
- Preferred Airline Baggage claim area or Airline Executive Lounge

PILOT PROJECTS: VIRTUAL QUEUING

Virtual Queuing – Impact on Terminals

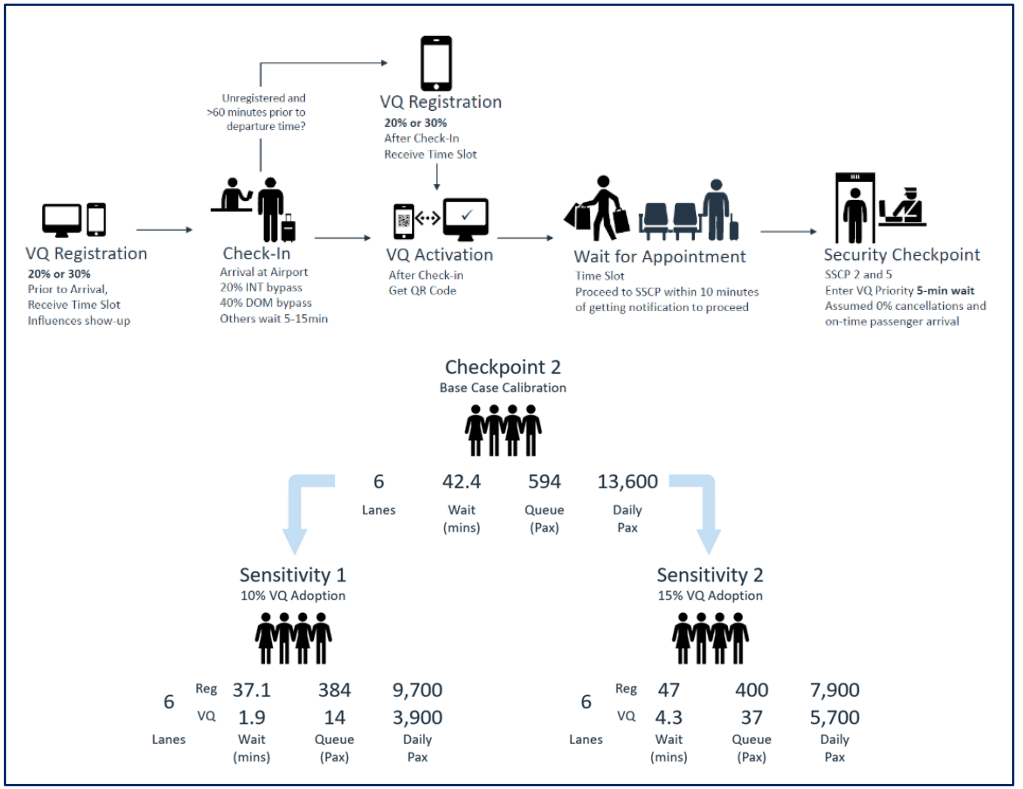
Executive Summary

Under the Virtual Queue Working Group a reasonable concept of operations for a Virtual Queue was developed using SEA as a demonstration model.

The simulation showed evidence of a potential benefit to passenger experience and security checkpoint operations. For the 10% VQ adoptions this included:

- 33% fewer passengers in queue (combined regular and VQ passengers)
- Time in queue of <5 mins for VQ passengers
- Reduced time in queue for regular passengers

The Terminal Working Group considered the potential impact of adopting VQ to a passenger terminal, highlighting areas for further study, and consideration in terminals adopting VQ approach. This can be seen overleaf.



Virtual Queue headline concept of operations and results summary. Further details are included in the Virtual Queue handbook

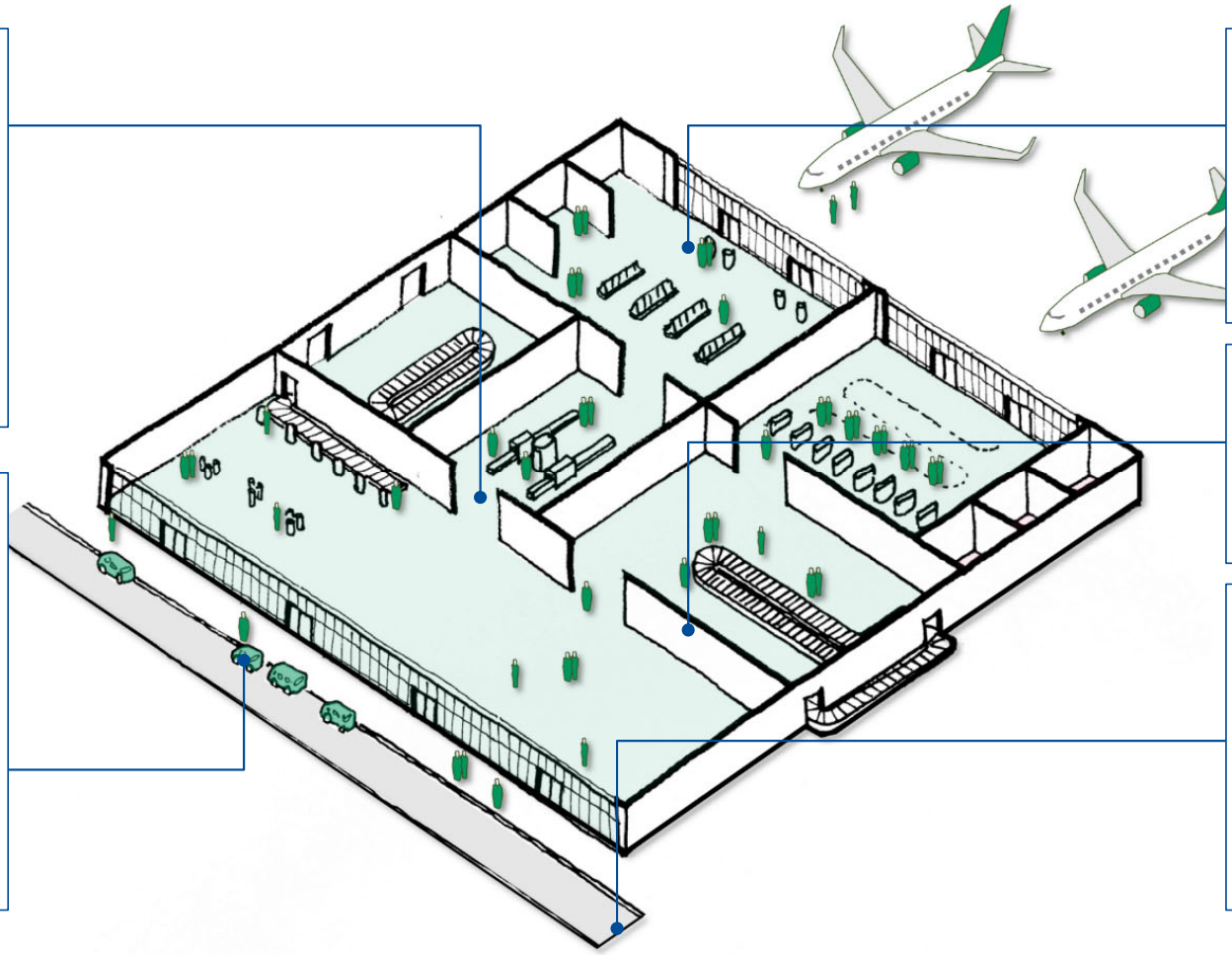
Virtual Queuing – Terminal Impact

The simulation showed that the number of passengers in queue may reduce by a third with the average time spent in queue dropping for all passengers (even those not using the VQ). This will free up more space not needed for queue spill, but may drive a requirement pre and post security for passengers to dwell prior to their flight.

33%

The Virtual Queue may drive the show-up profile – where reliable ground transport options are available.

It may have an impact on modes of accessing the airport, parking product (valet park may become more popular as travelers show up later) and the number of well wishers in the terminal may increase at families spend time together prior to departure.



Virtual queueing can also happen at boarding – YYZ has a trial in which passengers scan a QR code at the gate and receive updates as to when the flight is boarding, allowing passengers to spend more time away from the crowding of boarding zone.

Many terminals moved away from landside retail in terminals over the past 20 years. While there may be potential to redevelop this, there will need to be a robust business case to support increased dwell time pre-security.

Controlling the passenger experience from a technical viewpoint is good. This may not only change the configuration of the terminal but may provide opportunity for enhancing the public realm outside of the terminal – leaving the terminal as a processing machine.

PILOT PROJECTS: AIRBRIDGES

Airbridges – Impact on Terminals

Executive Summary

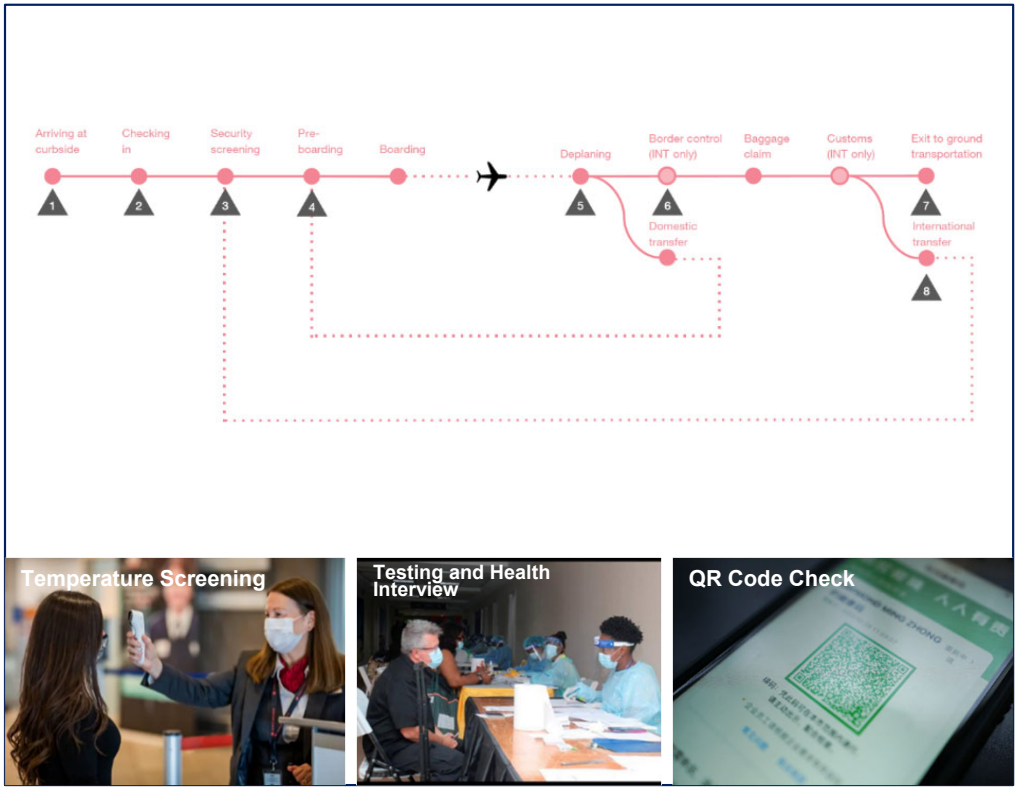
Under the Airbridges Working Group, a concept of operations was developed for the use of a secure digital clearing house platform, which would validate the origin-destination requirements and timings. This clearing house would provide the necessary validation for a Permit to Fly to be issued. At present, several apps developed platforms to provide secure verification of COVID-19 status and streamline the passenger journey.

The Terminal Working Group has considered the impact on the terminal for each of these locations.

The operational flows are assessed on how they protect the integrity of two variables:

- Passenger integrity; are passengers that are not permitted to fly going to be caught?
- Location integrity; would this testing regime effectively protect local/destination communities or staff at the local facility?

A combination of intervention options are likely to be the best approach and terminals should consider a range of drivers when deciding on the correct approach. These may include O&D/Transfer mix, number of international flights, and local conditions.



Airbridges concept of operations for Permit to Fly and the possible locations in the terminal for this verification

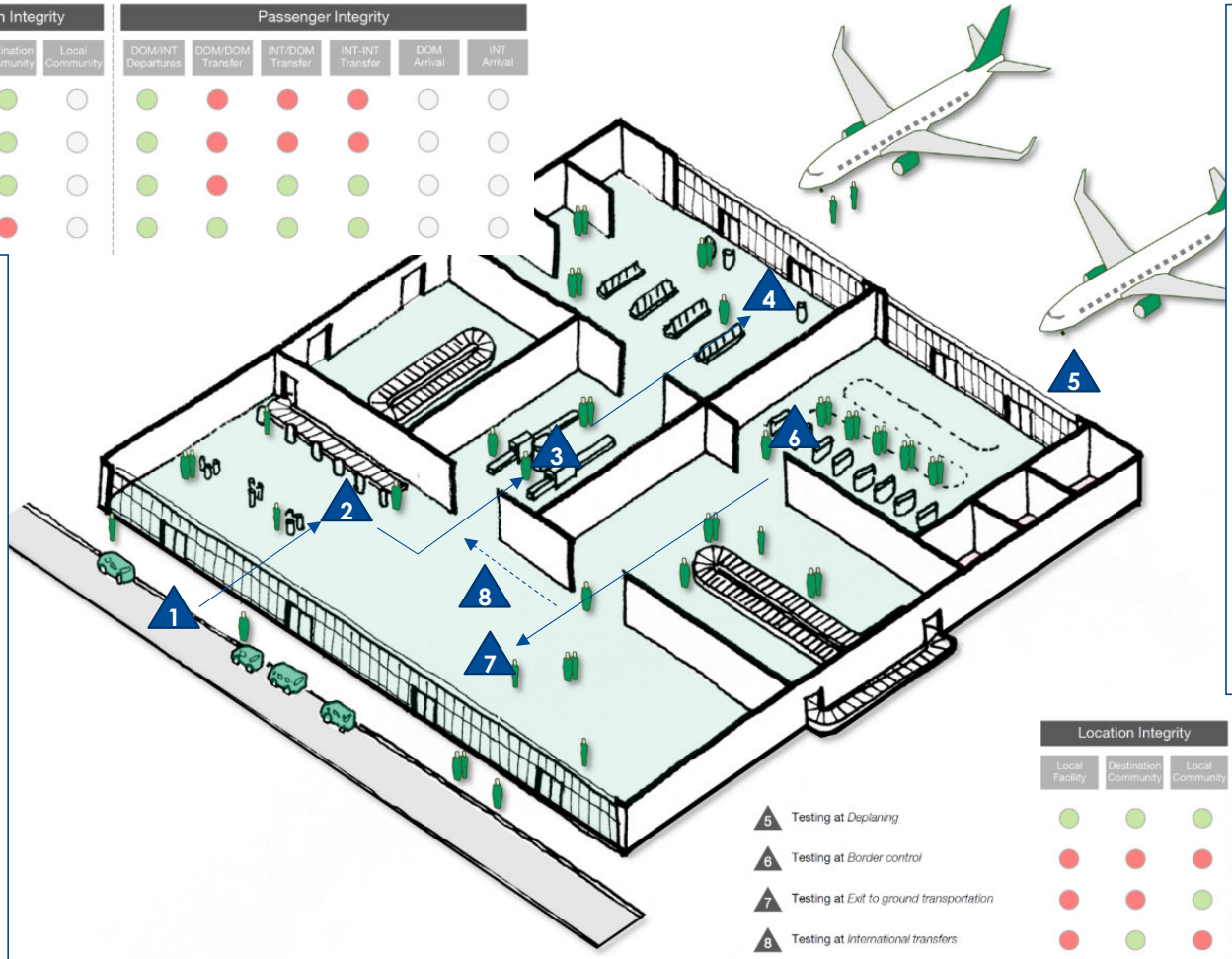
Airbridges Doc. Check & Verification – Terminal Impact

Departures

Verification to fly, doc. Check, and testing immeadiately at the door of the terminal maintains the location integrity of the terminal minimizing the risk of exposing staff and fellow travelers – however this would not be able to screen transfer passengers and may be best suited to terminals with high O&D traffic.

As the verification is pushed back along the departures journey, the location integrity of the terminal is compromised but a greater number of passengers can be included, and the checking process consolidated.

Instilling a verification procedure at each gate allows for all passengers to be verified but requires significant resources and space at each boarding location. It will also potentially delay flights if passengers denied boarding need to have luggage offloaded.



Arrivals

Testing immediately upon deplaning maintains high location integrity and provides for all passenger flows and transfers to be caught. This may be the best solution for flights from high-risk destinations.

As the verification is pushed back along the passenger journey, the location integrity of the terminal is compromised, but consolidation between flights is possible. This may be an option for lower risk international arrivals where all passengers are required to clear border control and customs.

If verification is undertaken at the ground transportation, international transfers would need to be dealt with under a separate testing protocol, however this may be undertaken with the departures flow.

CASE STUDY: EVENFLOW

Case Study: EVENFLOW

THE RESPONSE: *Passengers and press alike hail the Evenflow Crowd Radar as "a game changer," granting "peace of mind for families" and noting this innovative technology can be utilized in any major social setting.*

Passenger and press reaction was also very positive with passengers commenting on social media:

'I feel safe'

'Where has this technology been all my life?'

'The kids turned following the green lights into a game!'

'Thank you, Orlando Airport, for taking one layer of stress out of traveling with a young family'

WHAT COMES NEXT: *Synect has been contacted by several top airports in the United States, along with major stadiums, arenas, and theaters throughout the country, for programs using* ***Evenflow Crowd Radar*** *to help get the public back the people, places, and activities they love.*

EVENFLOW product marketing image

Case Study: EVENFLOW

THE RESPONSE: *Passengers and press alike hail the Evenflow Crowd Radar as "a game changer," granting "peace of mind for families" and noting this innovative technology can be utilized in any major social setting.*

Passenger and press reaction was also very positive with passengers commenting on social media:

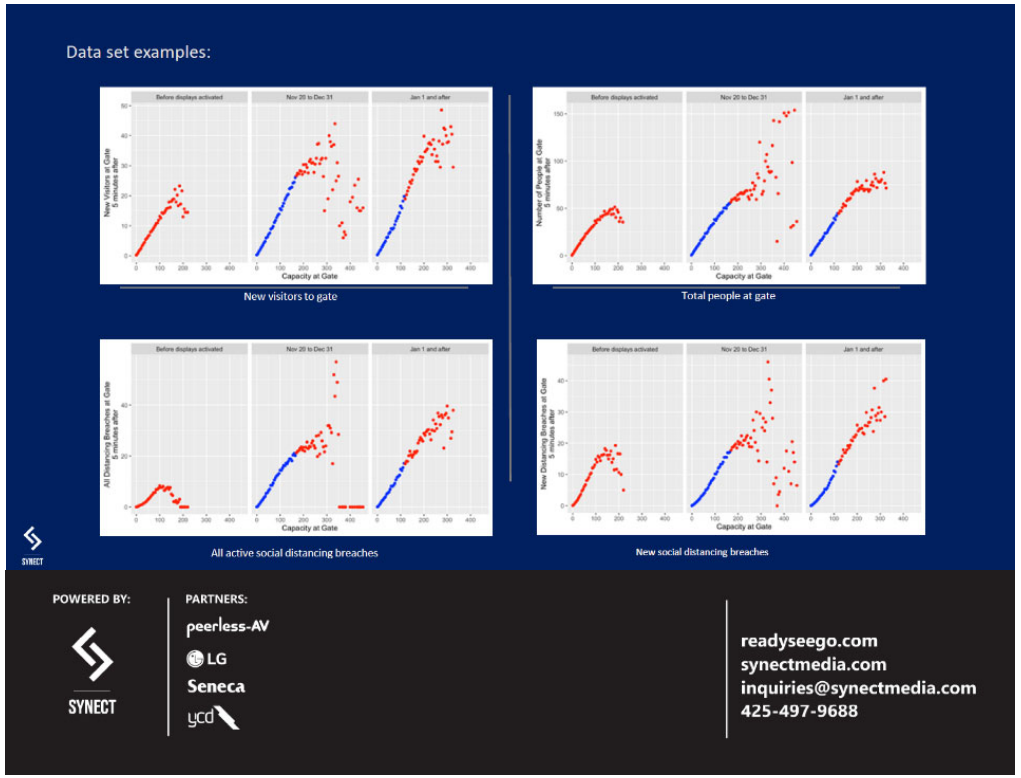
'I feel safe'

'Where has this technology been all my life?'

'The kids turned following the green lights into a game!'

'Thank you, Orlando Airport, for taking one of layer stress out of traveling with a young family'

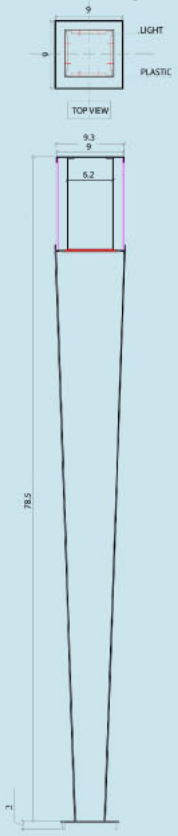
WHAT COMES NEXT: *Synect has been contacted by several top airports in the United States, along with major stadiums, arenas, and theaters throughout the country, for programs using* ***Evenflow Crowd Radar*** *to help get the public back the people, places, and activities they love.*

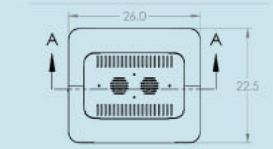


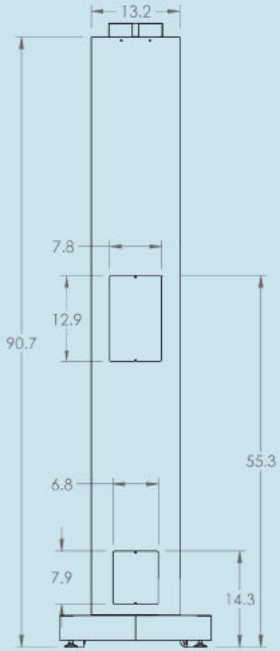
EVENFLOW Data Set example showing statistically significant increases in social distancing compliance at the Southwest Terminal at MCO following installation and activation of the pilot

Case Study: EVENFLOW

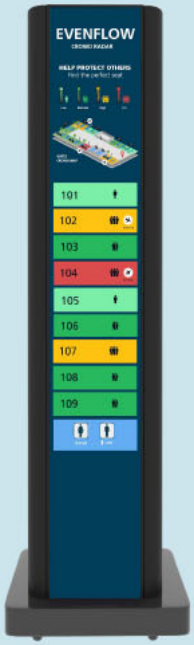
Social Light Pole







Evenflow Behavioral Messaging



readyseego.com
synectmedia.com
inquiries@synectmedia.com
425-497-9688

The Terminal and Passenger Facility Design Working Group has been actively supported by a range of airports, terminal operators, and industry participants.

Airport & Terminal Participants

Leadership

Bernardo Gogna A.A.E
Chief Development Officer, LAWA

Rebecca Hupp, A.A.E.
Airport Director, Boise Airport

Working Group Members

Mathias Auer-Zirem
Manager, Terminal Systems, GTAA

Paul Schenk
Manager, Terminal Development & Activation, GTAA

Gina Battagliola
Director, Terminal Redevelopment, JKFIAT

James Kissmer
Manager, Improvement & Innovation, JFKIAT

Robert Bergman
Senior Manager, Operations, JFKIAT

Shawn Makinen
Director, Facility Management & IT, JFKIAT

Khaled Naja
Executive Vice President, Infrastructure & Development, DFW

Kimberly Carter
Senior Innovation Consultant, DFW

Monica Lopez
Executive Administrative Assistant, LAWA

Industry Participants

Regine Weston
Stephen Russell

Ginger Evans

Nicholas May

Daniel Bloodworth
Dominic Jones

Ron Siecke
Steve Pelham

Gary McDonald
Daniel Dunn

Brian Smith
Marybeth Bunker

Broutin Sherrill
Tracie Blaser

AAAE.ORG/ACT

AIRPORT CONSORTIUM ON CUSTOMER TRUST