DUBLIN AIRPORT OPEX EFFICIENCY STUDY: 2027–2031

Annex C: Dublin Airport security process efficiency

ConOps and process maps

Evidence summary
(PUBLISHABLE)

February 2026

P1178.02

Contents

E

Executive summary

This annex summarises process-mapping evidence used to inform the Security assessment in the main Opex report

In addition to supporting the Irish Aviation Authority (IAA) in understanding Dublin Airport's security operations following the implementation of new technology and regulatory changes, the work has analysed the processes in detail to explore the scope for process improvement

The main security concept of operations (ConOps) provides a high-level description of the various security lane configurations in central search and at vehicle control posts

- Terminal 1 features five different configurations, with varying numbers of staff per lane, divestment positions, and body scanners, as well as differing roller bed lengths.
- Terminal 2 lanes all use the same configuration, with shorter roller bed lengths compared to Terminal 1.
- VCP configurations vary throughout Dublin Airport, although a single VCP configuration has been provided as an example.

The process maps: (i) provide a visualisation of the activity flow for the end-to-end security process; (ii) identify the roles of all the stakeholders; and (iii) enable identification of process fractures and critical activities that provide potential opportunities for improved efficiency

- To avoid unnecessary manual searches, security should inform passengers about airport and technology specific divestment requirements.
- Body scanner queues can be reduced by prioritising scanning passengers who can be searched by an available manual searcher (e.g. prioritising women through the scanner if the male manual searcher is already conducting a search).
- A secondary shoe detection system could also be used to reduce the amount of time spent on manual searches and avoid additional CT scans.
- During busy periods, an additional lane troubleshooter may be an effective way to alleviate any potential bottlenecks that appear in lanes, for example to clear manual search bag backlogs or provide an extra resource for passenger manual searches.
- Communicating with passengers ahead of time to understand any additional needs will allow staff to plan and prepare for these needs appropriately, rather than needing to respond reactively.

1

Introduction

The IAA initiated this study to gain a better understanding of Dublin Airport's security operation

This was done to identify any operational changes made due to recent policy and regulatory changes, as well as new technology – 3-D x-ray scanners and body scanners – implemented in both terminals in compliance with Regulation (EU) 2015/1998 and amendments

The security operation at Dublin has had several changes, including the implementation of Next Generation security and changes to divestment requirements

- Dublin Airport has completed the implementation of its 'Next Generation' aviation security operation, including the replacement of x-ray machinery with C3 cabin baggage scanning equipment, the introduction of automated tray return systems (ATRS) at Terminal 2 and the replacement of archway metal detectors (AMD) with full body scanning equipment.
- Several policy and regulatory changes have also come into effect recently, including multiple revisions to requirements for removing liquids, aerosols and gels (LAGs) and laptops from luggage prior to scanning and the status of the 100ml LAGs restriction depending on the certification status of the deployed x-ray equipment.
- Given these developments, the IAA commissioned this study to understand Dublin Airport's security operation and the new challenges faced by it.

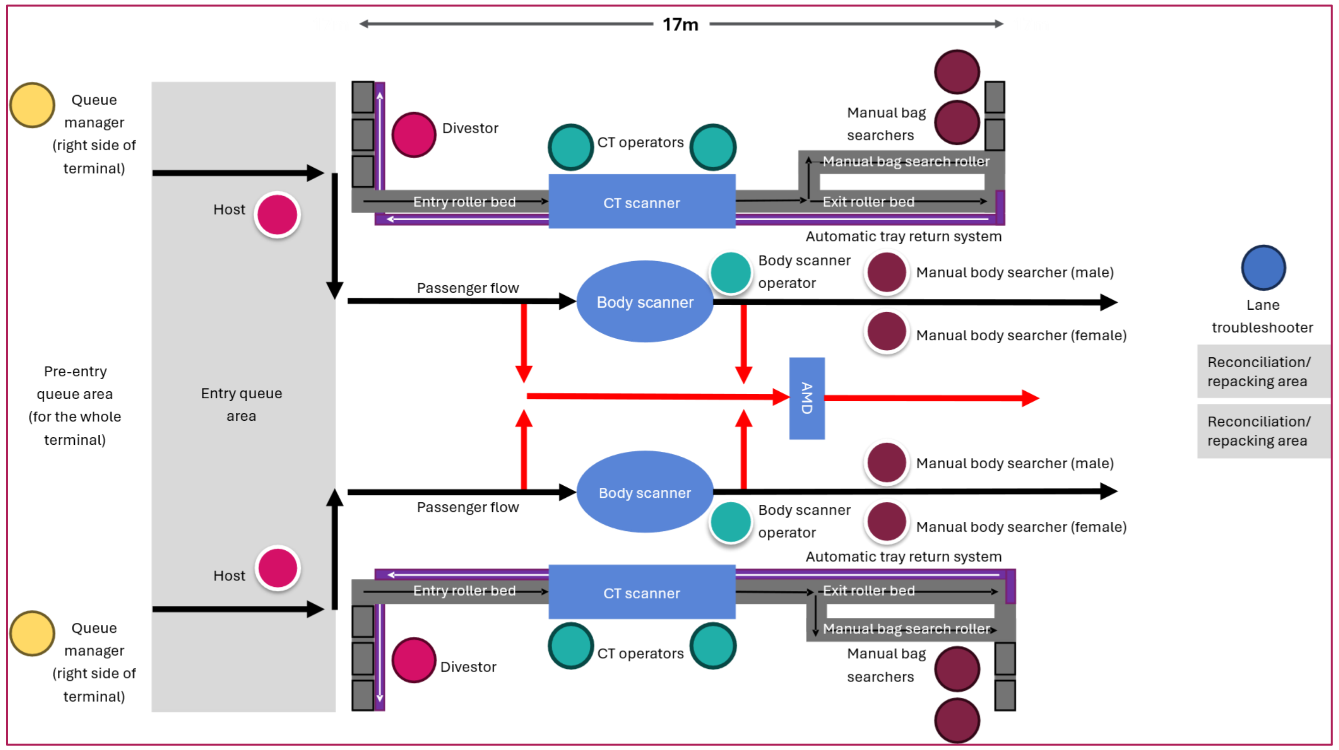
This annex focuses on the ConOps and security process at the airport, analysing the efficiency of operations

- This annex defines the baseline ConOps of security operations at Dublin Airport, showing the workflow for central search, including passenger and hand baggage flows, roles of security staff and the assets/technology deployed.
- A qualitative analysis of the security process was also conducted, mapping out the security process in detail and identifying where process fractures may occur, highlighting areas of potential improvement.
- Information was gathered from a site visit, conducted on 21 and 22 July, as well as multiple discussions with Dublin Airport to ensure the understanding of operations was correct.

This annex describes the security processes at Dublin Airport, identifying potential bottlenecks

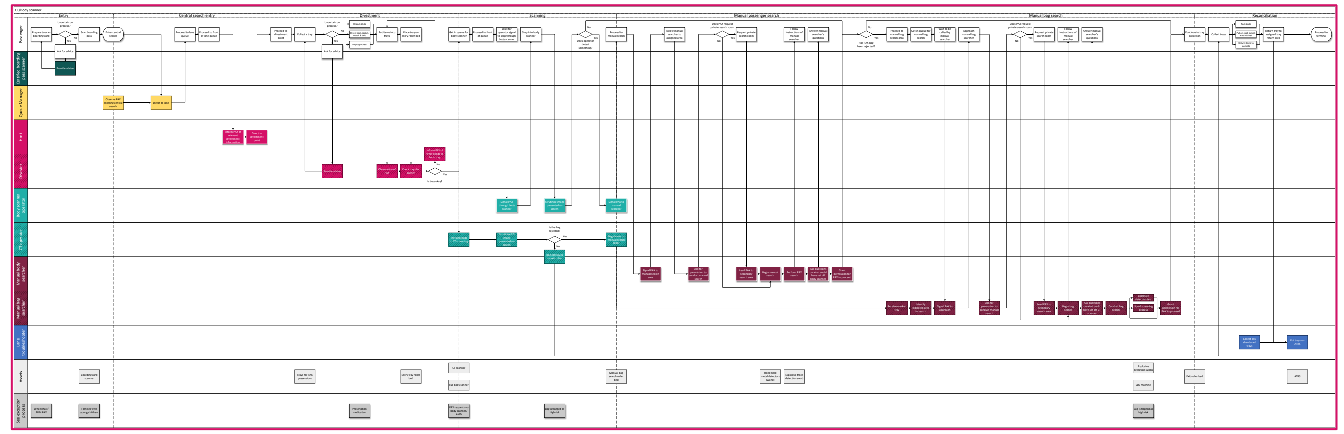
The processes are described at two levels: the ConOps that illustrates the security lane configurations, highlighting staff roles and passenger flow; and detailed process maps that describe each step in the flow of passengers and bags through security

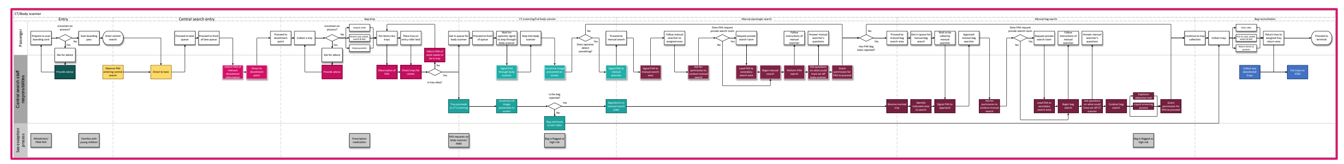
ConOps



A high-level depiction of security operations, including information on infrastructure layout, staff roles, and passenger flow.

Process maps





A detailed description of each step in the security screening process, defining the responsibilities of each actor and the dependencies of each activity.

2

ConOps

There are nine distinct staff roles conducting the security operation across central search, staff search, and vehicle control posts

These roles follow the naming conventions outlined by Dublin Airport. The number of staff assigned to each role varies depending on the specific lane configuration used

Title	Icon	Description	Staffing level
Queue manager		Manage passengers when they first enter central search, between boarding pass scan and the security lanes.	2 per terminal
Host		Operate on the passenger side of the divestment area, directing passengers to a divestment position and informing on security processes.	1 per lane
Divestor		Support passengers in the divestment process, informing on processes and helping to avoid overly cramped trays.	1-2 per lane
Body scanner operator		Operate body scanners, directing passengers through the scanner and reviewing the image, guiding them to a manual body searcher if required.	1 per lane
CT operator		Operate CT scanners, reviewing the content of passenger hand luggage going through a scanner. The CT system is matrixed, so the CT operator is not necessarily inspecting images on the machine at their location.	2 per lane
Manual body searcher		Conduct manual passenger body searches, with a minimum of one male body searcher and one female body searcher available per lane.	2 per lane (1 male + 1 female)
Manual bag searcher		Perform manual bag searches, including LAG screening and explosive swab testing.	2 per lane
Lane troubleshooter		Support lane operations to resolve bottlenecks, including managing rollers, returning trays to the ATRS and supporting manual bag searchers when dieback occurs.	0.5 per lane
Vehicle searcher		Conduct searches of vehicles through vehicle entry posts.	Exclusive to vehicle posts

Security screening configurations at Dublin Airport vary across the central search area (CSA) lanes and vehicle control posts (VCPs)

Although the basic processes are similar across Dublin Airport, security lanes vary in both infrastructure and staffing: T2 has the same configuration across all lanes but there are five different lane configurations in T1. Lanes are not aways staffed to the planned level

Terminal 1
(excludes conventional x-ray lanes that are being phased out)

Configuration 1:
- 17m roller bed
- one CT scanner and one body scanners per lane
- one secondary archway metal detector (AMD) shared between two adjacent lanes
- staffed by 10 security officers

Configuration 2:
- 19m roller bed
- one CT scanner and one body scanner per lane
- one secondary AMD shared between two adjacent lanes
- staffed by 11 security officers

Configuration 3:
- 23m roller bed
- one CT scanner and one body scanner per lane
- one secondary AMD shared between two adjacent lanes
- staffed by 11 security officers

Configuration 4:
- 23m roller bed
- one CT scanner and one and a half body scanners per lane
- one secondary AMD shared between two adjacent lanes
- staffed by 12 security officers

Configuration 5 (mezzanine):
- 23m roller bed
- one CT scanner and one body scanner per lane
- one secondary AMD shared between two adjacent lanes
- staffed by 11 security officers

CT scanners are matrixed across all configurations

Terminal 2
(excludes conventional x-ray lanes that are being phased out)

Configuration:
- 17m roller bed
- one CT scanner per lane matrixed across the CSA
- one body scanner per lane
- one secondary AMD shared between two adjacent lanes
- staffed by 10 security officers

VCPs
(includes one example as per observations, although other configurations are in operation)

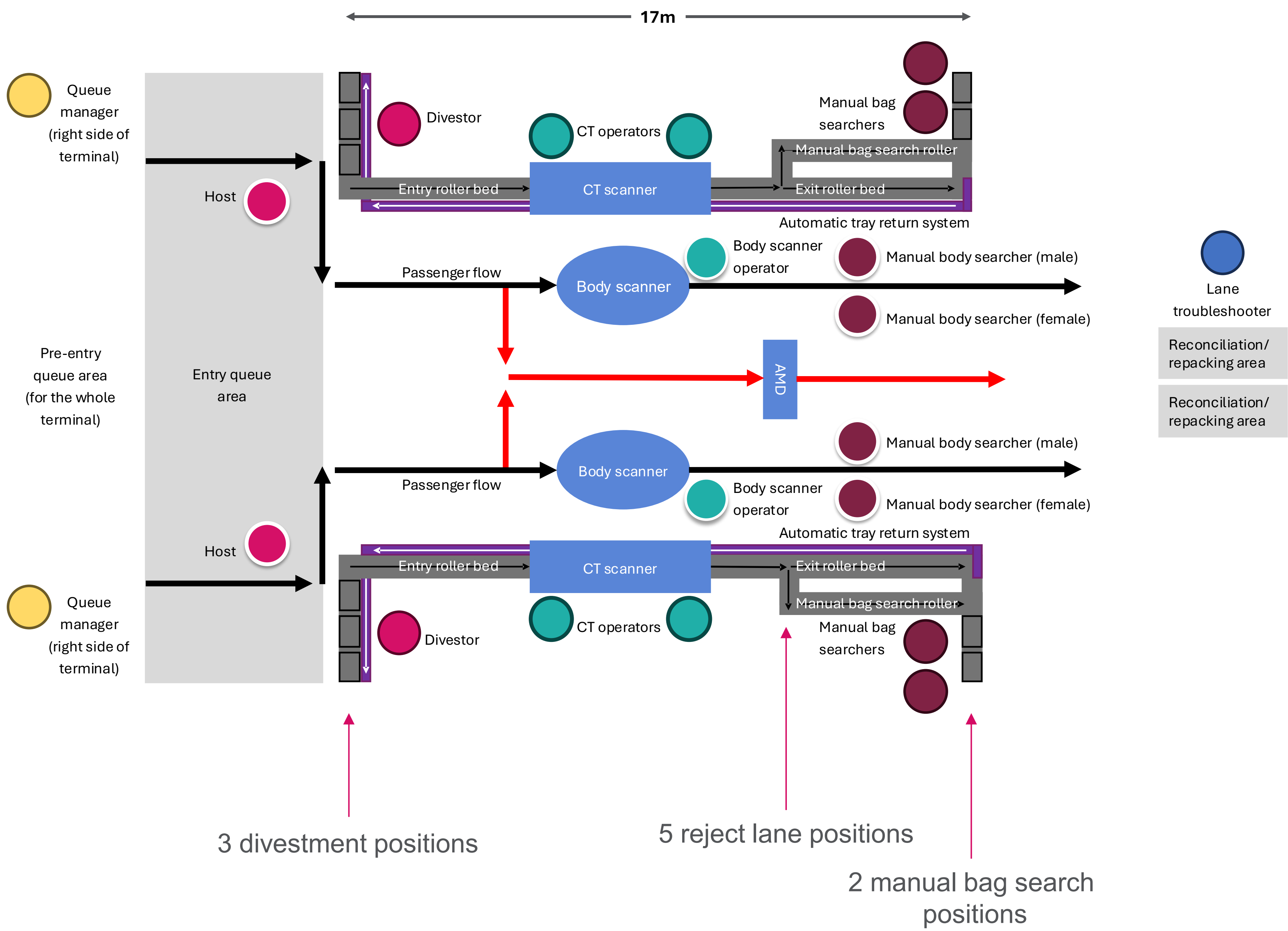
Example configuration:
- one CT scanner and one and a half body scanner per lane
- staffed by 8 security officers

It is understood that there are other VCP configurations but these were not observed and follow the principles of this example

The following slides describe the ConOps for each of these variations. The ConOps were developed by onsite observation and have been validated by Dublin Airport

T1 configuration 1 has a 17m roller bed, one CT and one body scanner per lane and one secondary AMD shared between two adjacent lanes

Each pair of lanes is staffed by 19 security officers: two hosts, two divestors, four CT operators, two body scanner operators, four manual bag searchers, four manual body searchers (two male and two female) and one troubleshooter



In T1 configuration 1, passengers are directed to lanes by one of **two queue managers** responsible for the terminal.

After queuing, **a host** directs passengers to one of **three divestment positions**, where **a divestor** supports passengers in the divestment process.

Most passengers proceed to the body scanner. Passengers who opt out of this are directed to either a secondary AMD or a manual body searcher.

Previously one AMD was shared between two lanes. However, as the processing rate of the body scanner is lower than AMD scanners, T1 configuration 1 has **two body scanners between two lanes**, although this has a higher staffing requirement than the previous AMD layout.

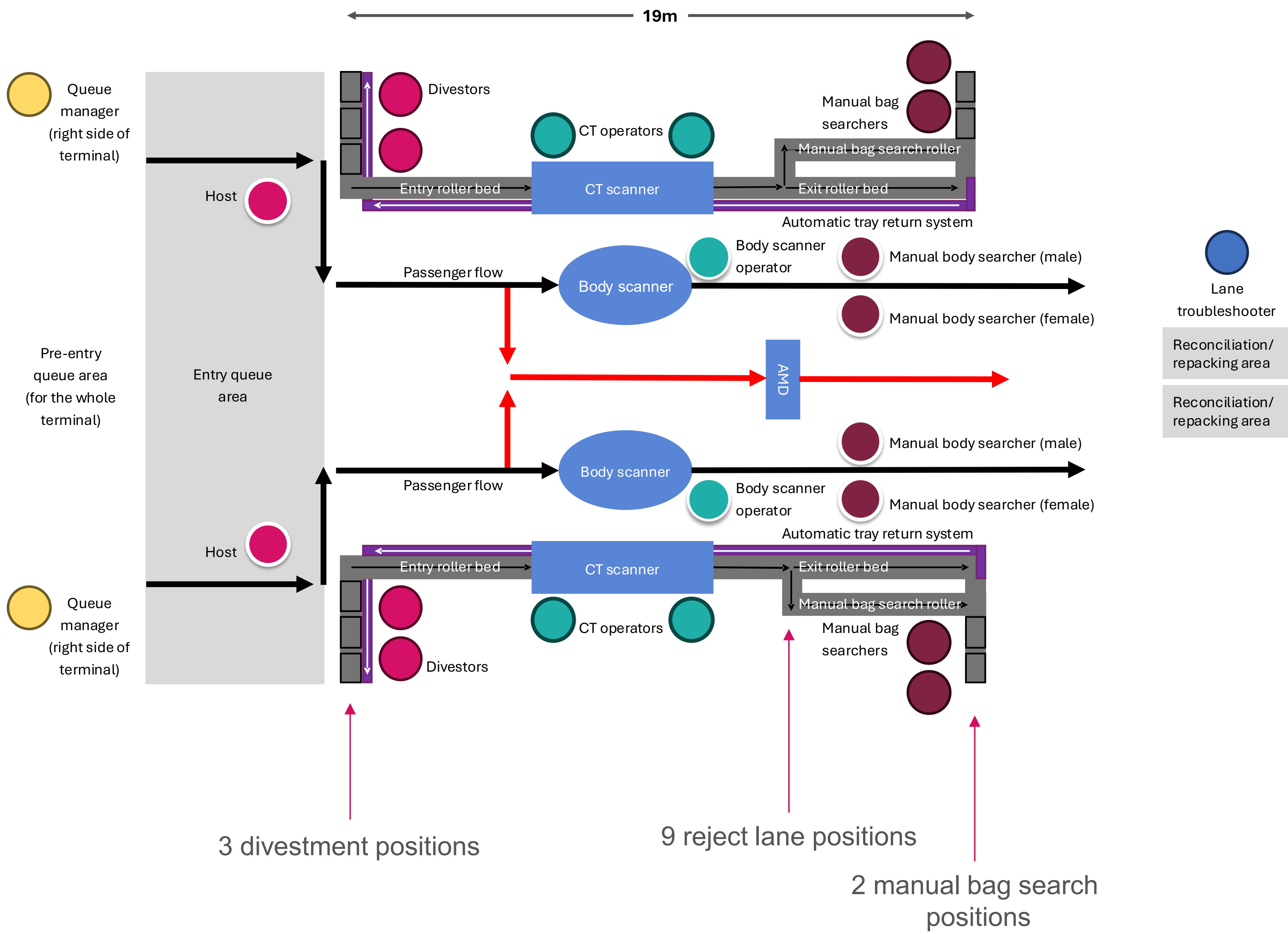
Hand luggage is directed to the CT scanner, which requires **two CT operators**. These are matrixed, so a CT operator will not necessarily be reviewing luggage on their lane.

A single lane troubleshooter operates between two lanes to deal with stresses in the system.

Source: Think analysis, Dublin Airport

T1 configuration 2 has a 19m roller bed, one CT and one body scanner per lane, and one secondary AMD shared between two adjacent lanes

Each pair of lanes is staffed by 21 security officers: two hosts, four divestors, four CT operators, four body scanner operators, four manual bag searchers, four manual body searchers (two male and two female) and one troubleshooter



In T1 configuration 2, passengers are directed to lanes by one of **two queue managers** responsible for the terminal.

After queuing, **a host** directs passengers to one of **three divestment positions**, where **two divestors** support passengers in the divestment process.

Most passengers proceed to the body scanner. Passengers who opt out of this are directed to either a secondary AMD or a manual body searcher.

Previously one AMD was shared between two lanes. However, as the processing rate of the body scanner is lower than AMD scanners, T1 configuration 2 has **two body scanners between two lanes**, although this has a higher staffing requirement than the previous AMD layout.

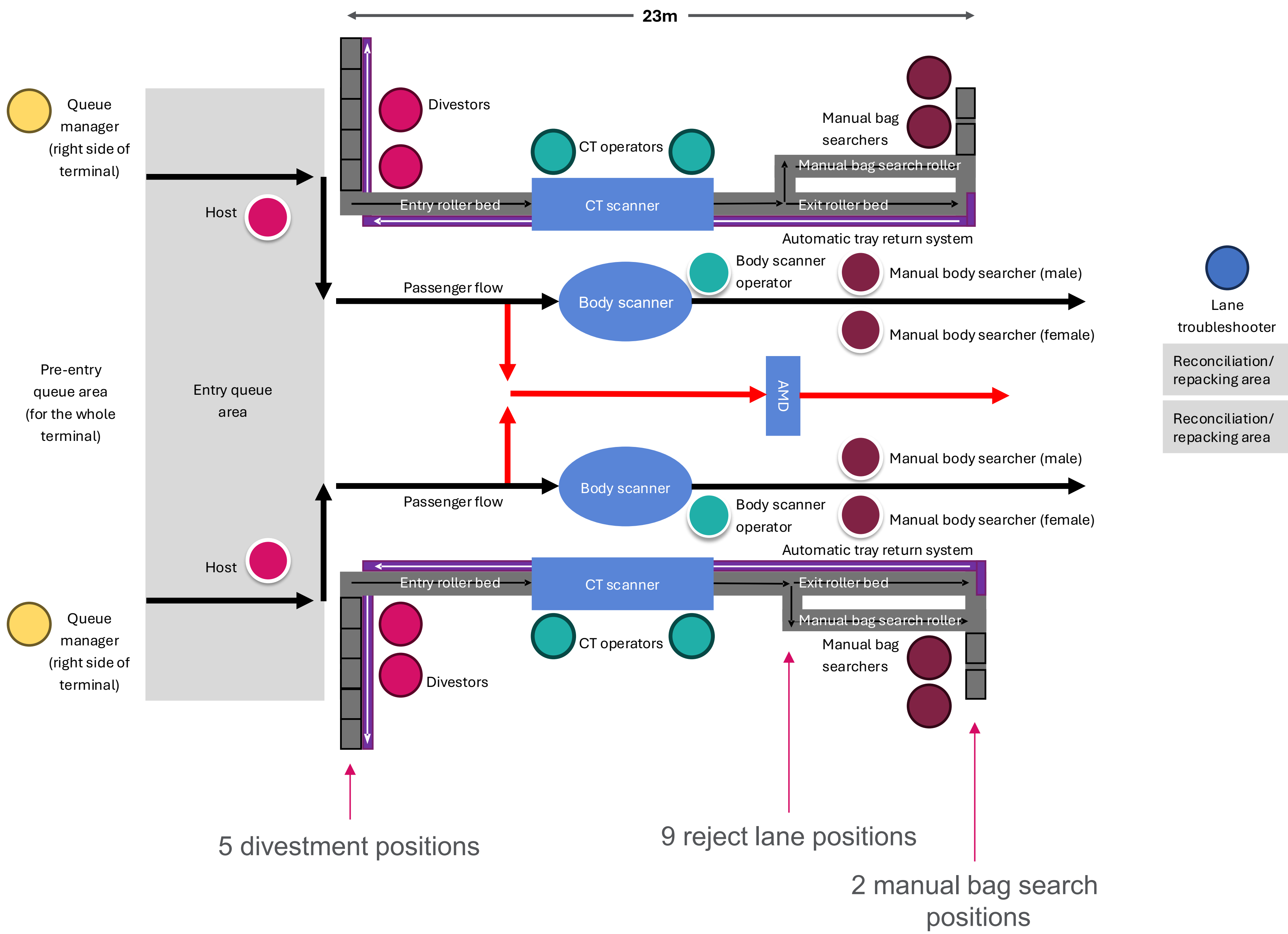
Hand luggage is directed to the CT scanner, which requires **two CT operators**. These are matrixed, so a CT operator will not necessarily be reviewing luggage on their lane.

A single lane troubleshooter operates between two lanes to deal with stresses in the system.

Source: Think analysis, Dublin Airport

T1 configuration 3 has a 23m roller bed, one CT and one body scanner per lane, and one secondary AMD shared between two adjacent lanes

Each pair of lanes is staffed by 21 security officers: two hosts, four divestors, four CT operators, two body scanner operators, four manual bag searchers, four manual body searchers (two male and two female) and one troubleshooter



In T1 configuration 3, passengers are directed to lanes by one of **two queue managers** responsible for the terminal.

After queuing, **a host** directs passengers to one of **three divestment positions**, where **two divestors** support passengers in the divestment process.

Most passengers proceed to the body scanner. Passengers who opt out of this are directed to either a secondary AMD or a manual body searcher.

Previously one AMD was shared between two lanes. However, as the processing rate of the body scanner is lower than AMD scanners, T1 configuration 3 has **two body scanners between two lanes**, although this has a higher staffing requirement than the previous AMD layout.

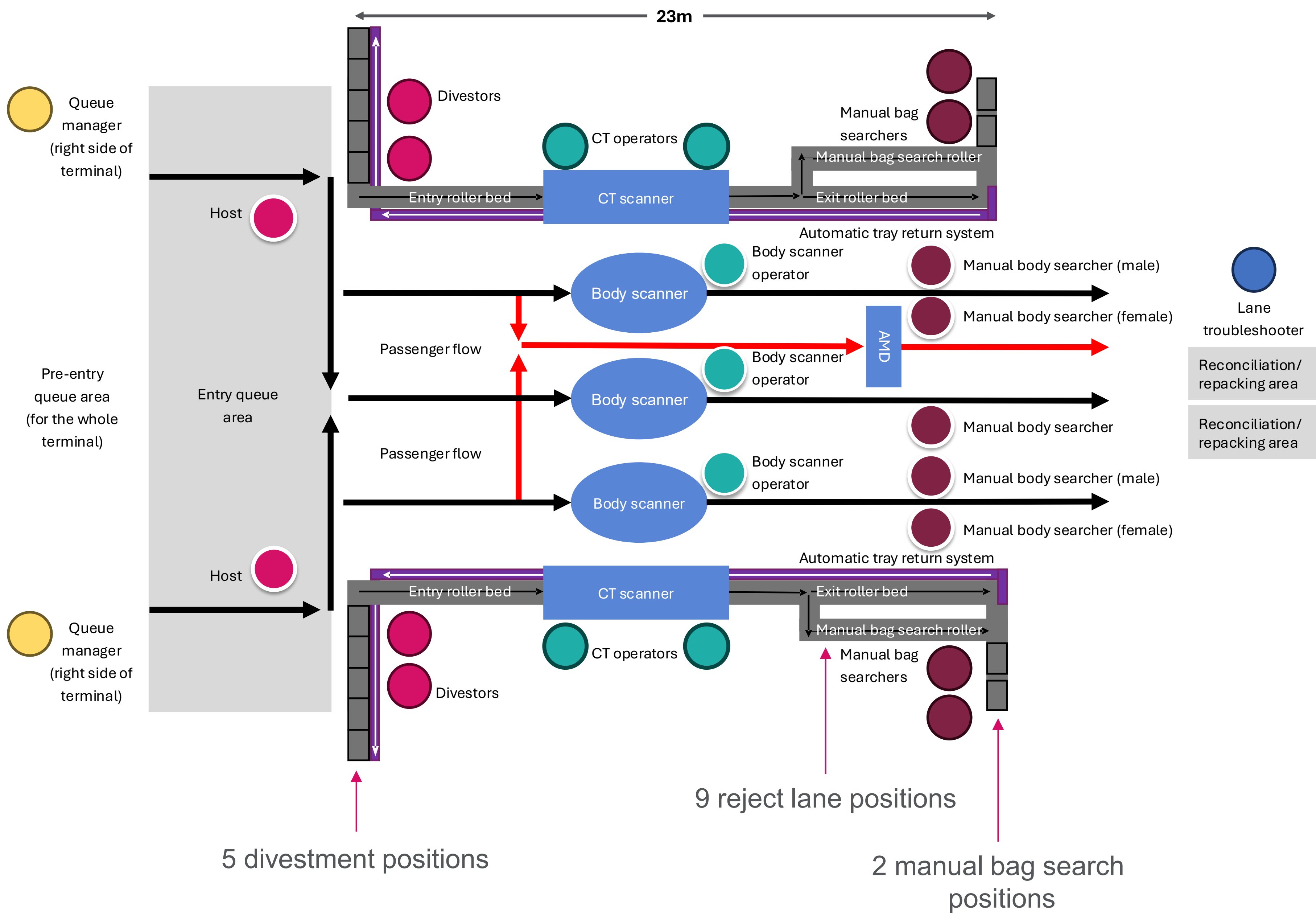
Hand luggage is directed to the CT scanner, which requires **two CT operators**. These are matrixed, so a CT operator will not necessarily be reviewing luggage on their lane.

A single lane troubleshooter operates between two lanes to deal with stresses in the system.

Source: Think analysis, Dublin Airport

T1 configuration 4 has a 23m roller bed, one CT and one and a half body scanners per lane, and one secondary AMD shared between two adjacent lanes

Each pair of lanes is staffed by 23 security officers: two hosts, four divestors, four CT operators, three body scanner operators, four manual bag searchers, five manual body searchers (at least two male and two female) and one troubleshooter



In T1 configuration 4, passengers are directed to lanes by one of **two queue managers** responsible for the terminal.

At the front of the queue, **a host** directs passengers to one of **five divestment positions**, where they are supported by **two divestors** in the divestment process.

Most passengers proceed to the body scanner. Passengers who opt out of this are directed to either a secondary AMD or a manual body searcher.

Previously one AMD was shared between two lanes. However, as the processing rate of the body scanner is lower than AMD scanners, T1 configuration 4 has **three body scanners between two lanes**, although this has a higher staffing requirement than the previous AMD layout.

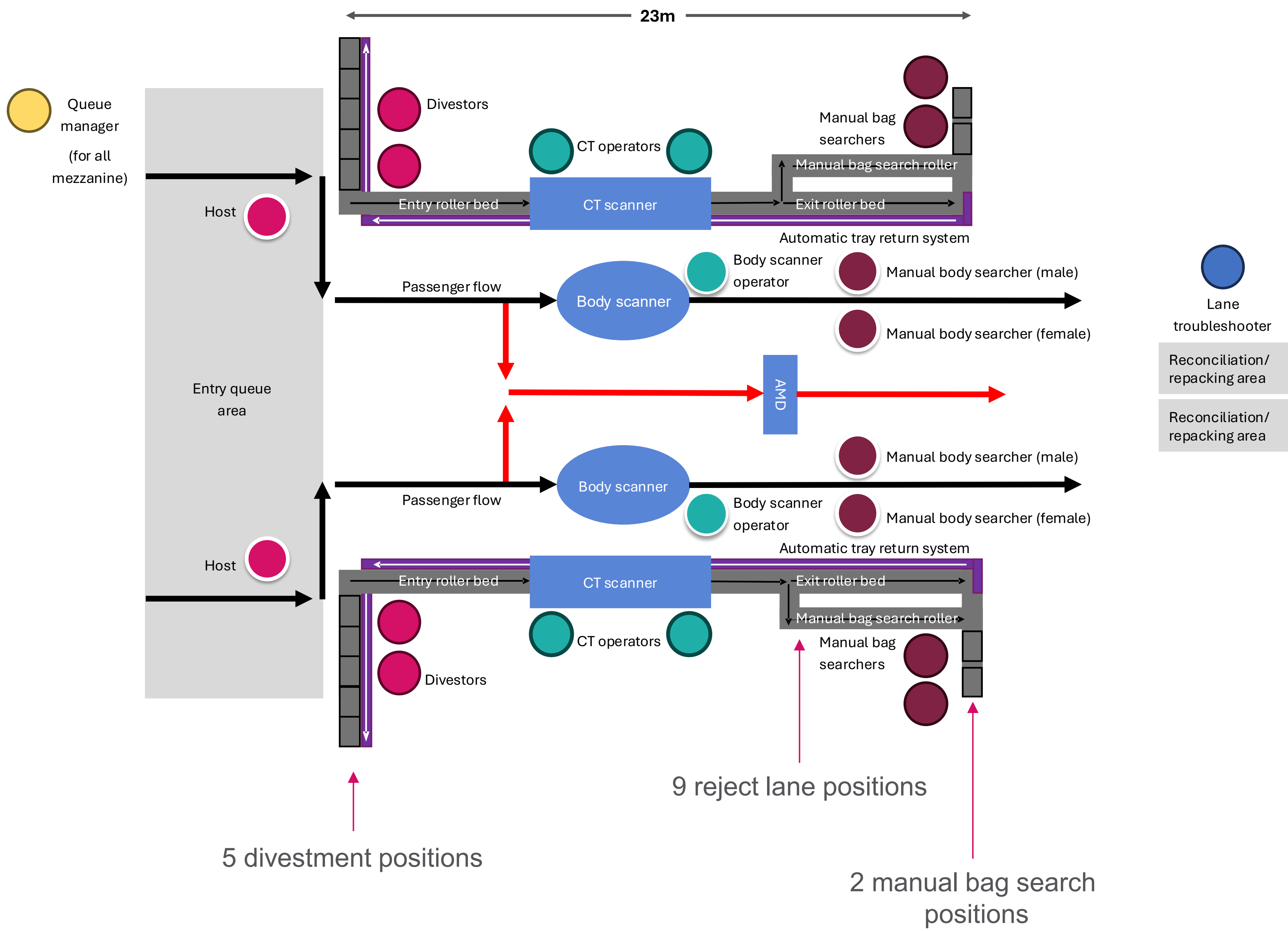
Hand luggage is directed to the CT scanner, which requires **two CT operators**.

A single lane troubleshooter operates between two lanes to deal with stresses in the system.

Source: Think analysis, Dublin Airport

T1 configuration 5 (mezzanine) has a 23m roller bed, one CT and one body scanner per lane, and one secondary AMD shared between two adjacent lanes

Each pair of lanes is staffed by 21 security officers: two hosts, four divestors, four CT operators, two body scanner operators, four manual bag searchers. four manual body searchers (two male and two female) and one troubleshooter



In T1 configuration 5, passengers are directed to lanes by **a queue manager** responsible for the mezzanine.

At the front of the queue, **a host** directs passengers to one of **five divestment positions**, where they are supported by **two divestors** in the divestment process.

Most passengers proceed to the body scanner. Passengers who opt out of this are directed to either a secondary AMD or a manual body searcher.

Previously one AMD was shared between two lanes. However, as the processing rate of the body scanner is lower than AMD scanners, T1 configuration 5 has **two body scanners between two lanes**, although this has a higher staffing requirement than the previous AMD layout.

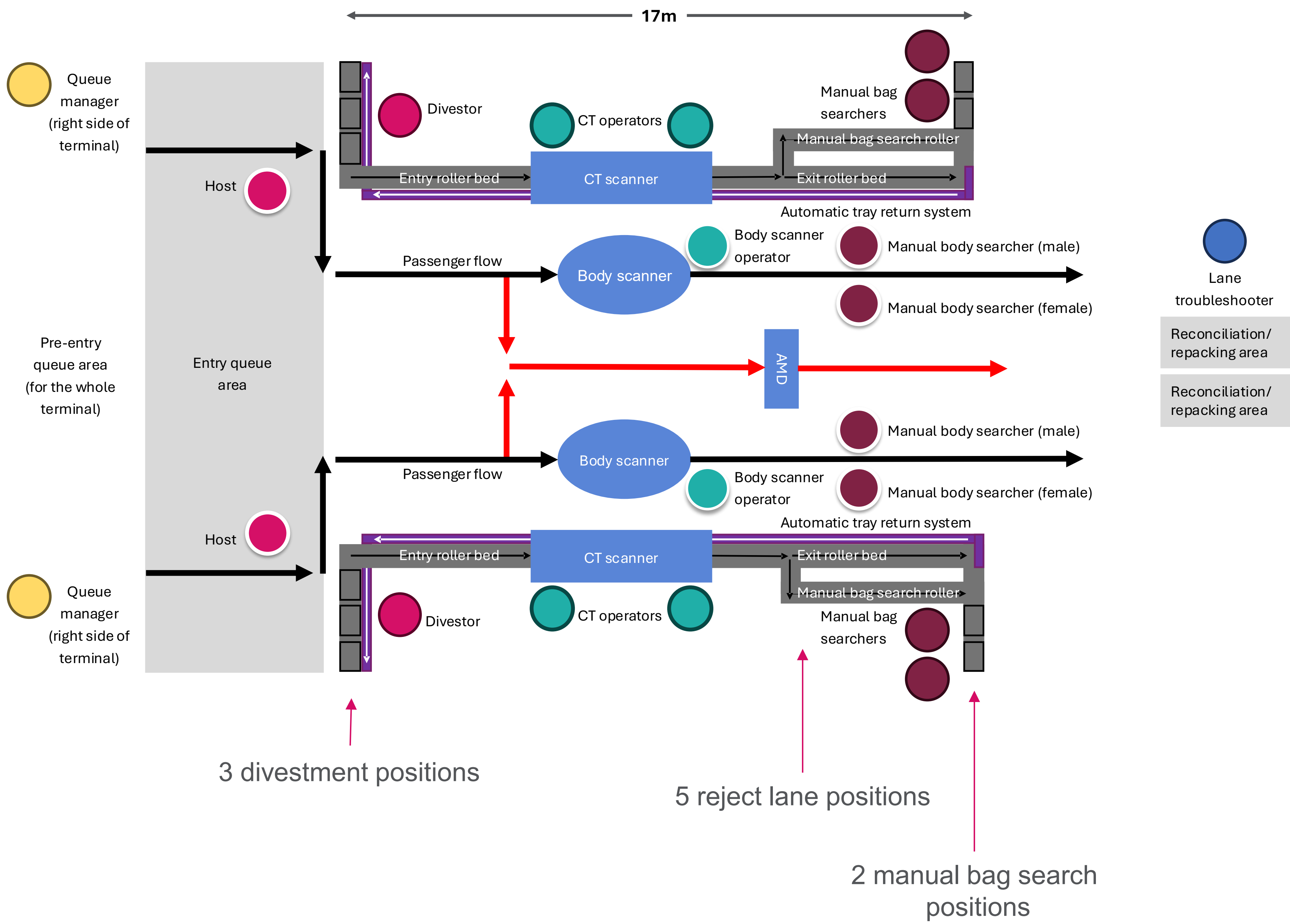
Hand luggage is directed to the CT scanner, which requires **two CT operators**.

A single lane troubleshooter operates between two lanes to deal with stresses in the system.

Source: Think analysis, Dublin Airport

All T2 security lanes have a 17m roller bed, one CT and one body scanner per lane, and one secondary AMD shared between two adjacent lanes

Each pair of lanes is staffed by 19 security officers: two hosts, two divestors, four CT operators, two body scanner operators, four manual bag searchers, four manual body searchers (two male and two female) and one troubleshooter



In T2, passengers are directed to lanes by one of **two queue managers** responsible for the terminal.

At the front of the queue, **a host** directs passengers to one of **three divestment positions**, where they are supported by **a divestor** in the divestment process.

Most passengers proceed to the body scanner. Passengers who opt out of this are directed to either a secondary AMD or a manual body searcher.

Previously one AMD was shared between two lanes. However, as the processing rate of the body scanner is lower than AMD scanners, T2 configuration 1 has **two body scanners between two lanes**, although this has a higher staffing requirement than the previous AMD layout.

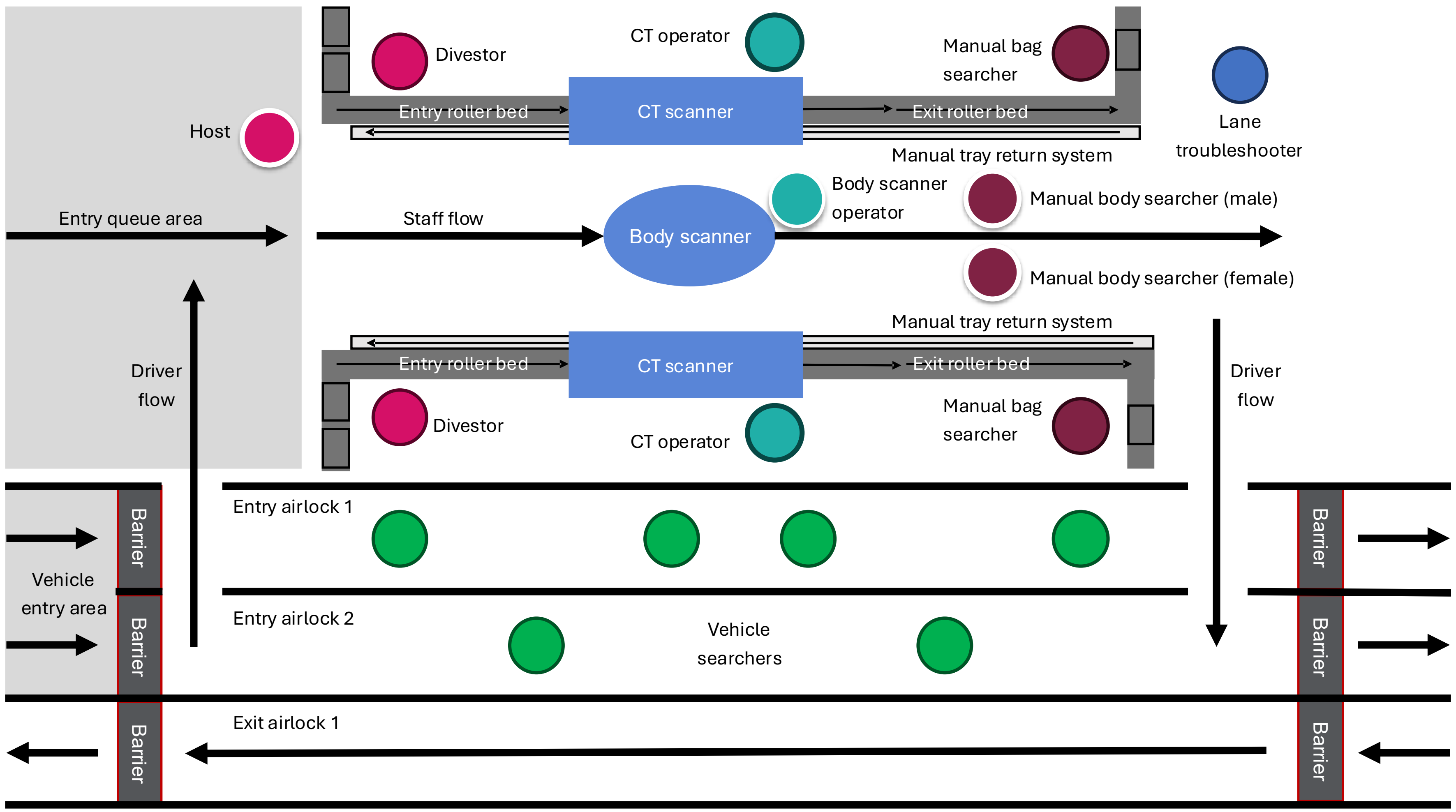
Hand luggage is directed to the CT scanner, which requires **two CT operators**.

A single lane troubleshooter operates between two lanes to deal with stresses in the system.

Source: Think analysis, Dublin Airport

The example VCP configuration has one CT scanner per lane and one body scanner shared between two adjacent lanes

Each lane is staffed by 8 security officers: a host, a divestor, one CT operator, one body scanner operator, one manual bag searcher, two manual body searchers (one male and one female) as well as a troubleshooter shared between two adjacent lanes and vehicle searchers



In the VCPs, personnel (most often but not always vehicle drivers) proceed through a single queue for two lanes. At the front of the queue, they are directed by **a host** to one of **two divestment positions** at one of the two lanes, where they are supported by **a divestor** in the divestment process.

Most personnel proceed to the body scanner, although some will opt out of this and are directed to the manual body searchers.

This VCP configuration has **one body scanner between two lanes** operated by **a body scanner operator**. Other VCPs were not observed and might differ slightly.

Personal belongings examined by the CT scanner, which requires **two CT operators**, one per scanner.

During this screening process, vehicle searchers examine the vehicles parked within the entry airlocks. The capacity of the airlocks will vary between different VCPs and is dependent on the size of the vehicles arriving. Only when both screenings are completed can the driver proceed.

A single lane troubleshooter operates between two lanes to deal with stresses in the system.

Source: Think analysis, Dublin Airport

Bottlenecks in security are likely derived from the size of the lane infrastructure, including the roller beds, divestment positions and manual bag search positions

Due to matrixing of CT scanners and each lane having at least one body scanner, these are unlikely to be the primary bottlenecks driving queueing

Properly managed, body and CT scanners are unlikely to be the primary driver of bottlenecks

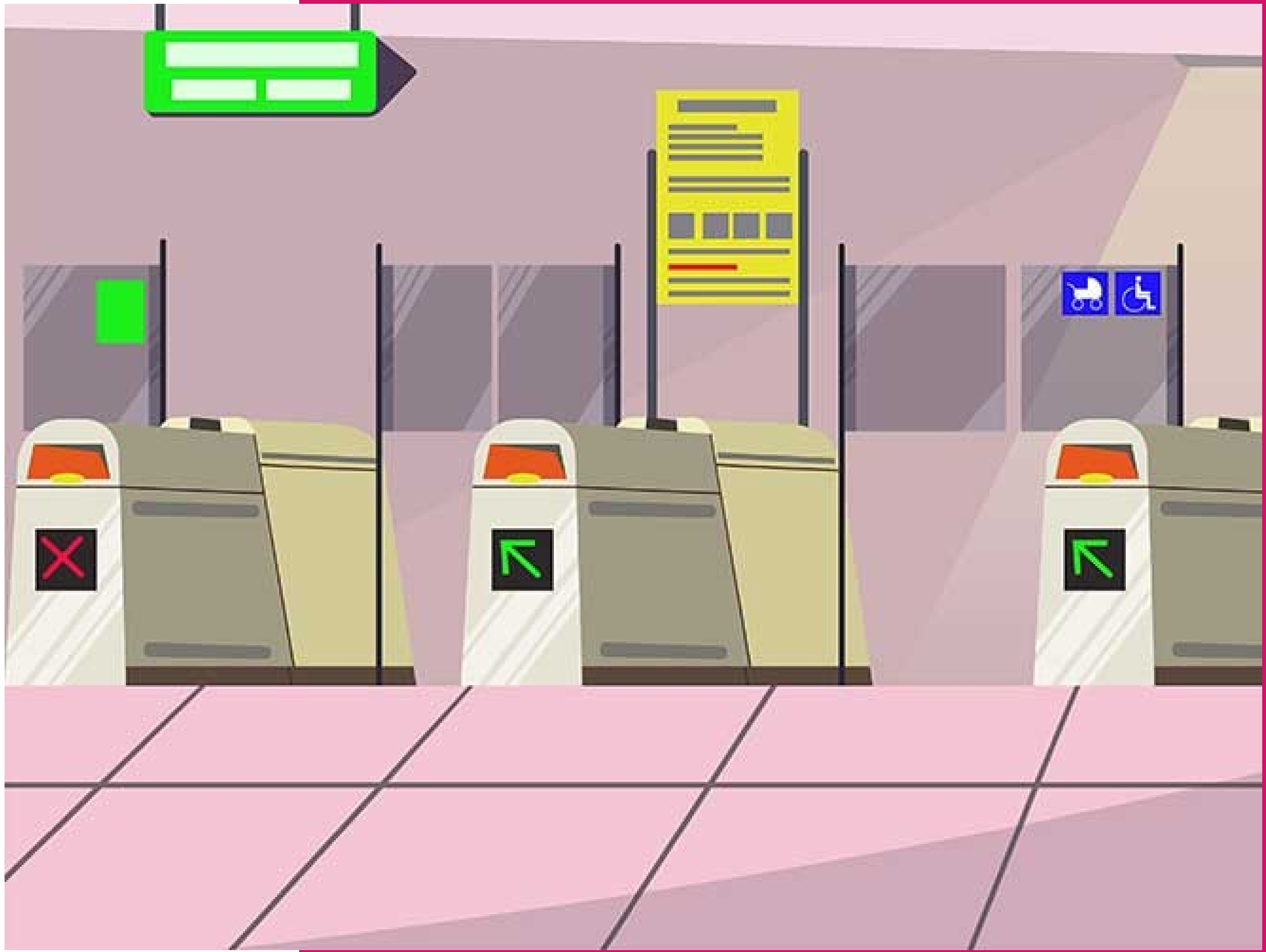
- Configurations in T1 use a combination of one or 1.5 body scanners per lane: benchmarking shows that throughput of these body scanners is comparatively low. Under current operations, body scanner throughput would likely be the binding capacity constraint in T2 although the benchmarking shows that this throughput could be increased considerably.
- Configurations in T2 use a minimum of one body scanner per lane which benchmarking shows that body scanners are not the binding constraint in T2.
- CT scanners are unlikely to be a bottleneck because these are matrixed, meaning delays in one lane can be supported in lanes with less strain.
- However, processing of passengers through body and CT scanners needs to be managed properly to ensure they are in balance, as one outpacing the other can cause overcrowding of passengers or hand baggage in the process, leading to dieback and congestion.

Bottlenecks are more likely to be the result of other infrastructure limitations, such as lane length and the number of positions for divestment and bag search

- The number of manual bag search positions can cause the manual search process to be a bottleneck for queueing even when CT scanning is adequate.
- Throughout both terminals, lanes only support two manual bag search positions per lane, limiting the flexibility to bring in additional manual bag searches during peaks in tray rejections.
- In these scenarios, shorter lanes are more susceptible to dieback as the manual bag search roller has less space for rejected hand baggage.
- The identified lanes most likely to experience these bottlenecks are T1 configuration 1 in and the T2 configuration, both having 17m lanes, while T1 configuration 2 is only slightly longer with 19m lanes.
- These configurations are also limited with only three divestment positions each, making this area more susceptible to blockage by passengers not adequately prepared for divestment.

3

Process maps



Process maps define the flow of passengers and hand baggage through each step in security screening, including both baseline and exception processes

The process maps support the ConOps, providing additional detail on the specific flow of passengers and bags through security. The information provided is based on onsite observations and discussions with Dublin Airport, who have since reviewed and validated the process maps

Entry → Divestment → Scanning → Manual search → Reconciliation

Baseline process

We have used a swim-lane convention to map the processes, identifying and allocating activities to passengers and each staff role as well as listing the supporting infrastructure for each step. The baseline map illustrates the standard flow of activities, including their interdependencies and handovers from one stakeholder to another. The maps are tools to identify potential bottlenecks, process fractures and potential duplications, as well as highlighting where processes are more complex than needed

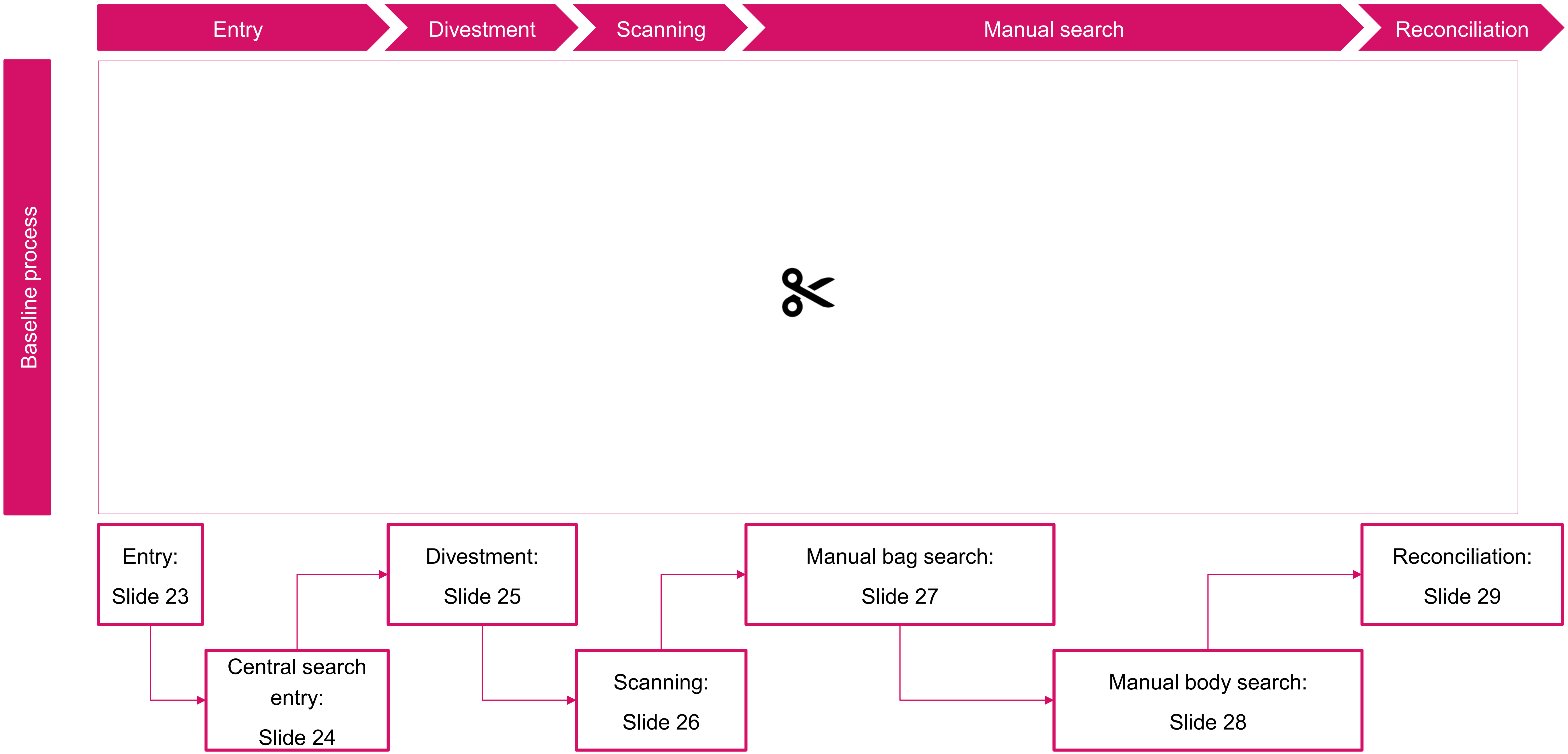
Exception processes

We have also mapped all exception processes we are aware of, highlighting how they differ from the baseline. These exception processes are:

- Families with small children
- High risk hand baggage
- PRM and passengers using wheelchairs
- Passengers opting out of using the body scanners

Each step of the security screening has been broken down into sub-process steps which are illustrated on separate slides

The slides are presented in the order a passenger would experience them when going through security, from entry to the central search area through to bag reconciliation



This map is zoomable by the reader to aid legibility. Process maps are also provided separately in PDF and Visio formats

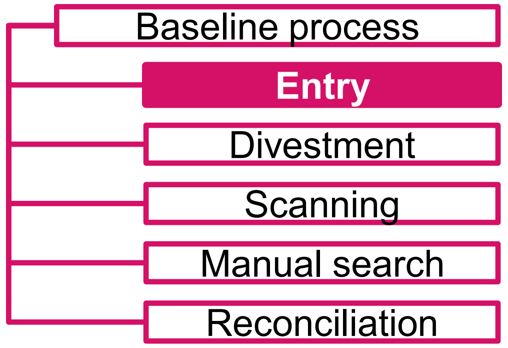
Baseline process

This sub-section describes the baseline process in detail step-by-step using the following structure

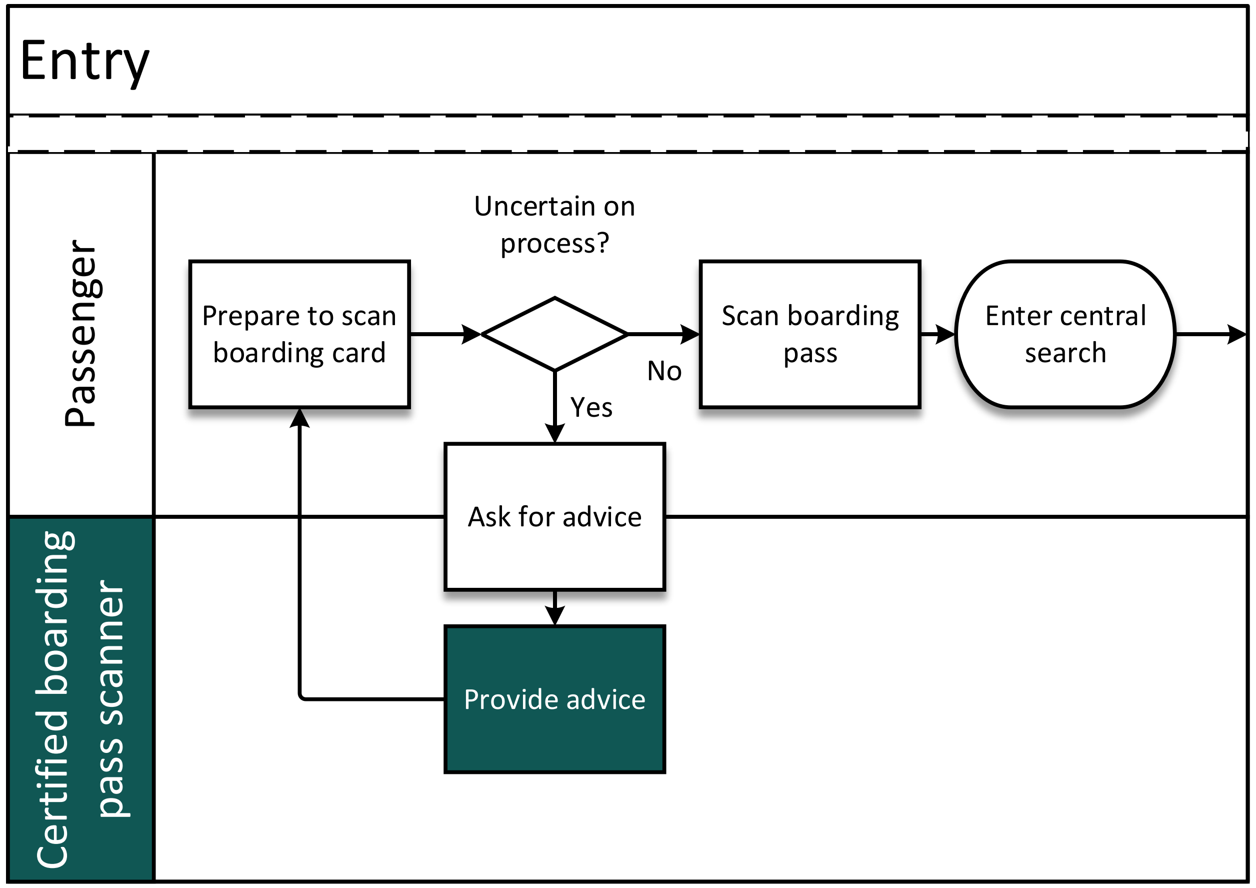
- Baseline process
  - Entry
  - Divestment
  - Scanning
  - Manual search
  - Reconciliation

Certified boarding pass scanners support passengers as they enter central search to avoid queue build-ups

Queue managers can also reduce the likelihood of a backlog by communicating with boarding pass scanners when they see passengers who require assistance that are not easily visible to the boarding pass scanners



Flow



Potential process fractures

- Passengers finding the technology difficult to understand/navigate may end up getting stuck at the front of a queue at boarding pass scan, making it harder for them to seek assistance.

Sub-process

- Passengers are required to scan their ticket before entering central search.
- While this process is not in the remit of airport security, it is important to understand as it directly impacts the rate passengers enter central search.

Observations

- It is important to understand any potential knock-on effects of a failed boarding card scan, as disruptions to the scanning process can cause large queues to form. This is especially important during busy periods as passengers may not be able to identify that other passengers ahead in the queue are experiencing issues.
- While we understand that only certified personnel can assist passengers during boarding pass scanning, it could be useful for the queue manager to identify passengers requiring assistance and bring them to the attention of the boarding pass scanner during busy periods, as this would help to clear queue backlogs and solve issues in a timely manner.

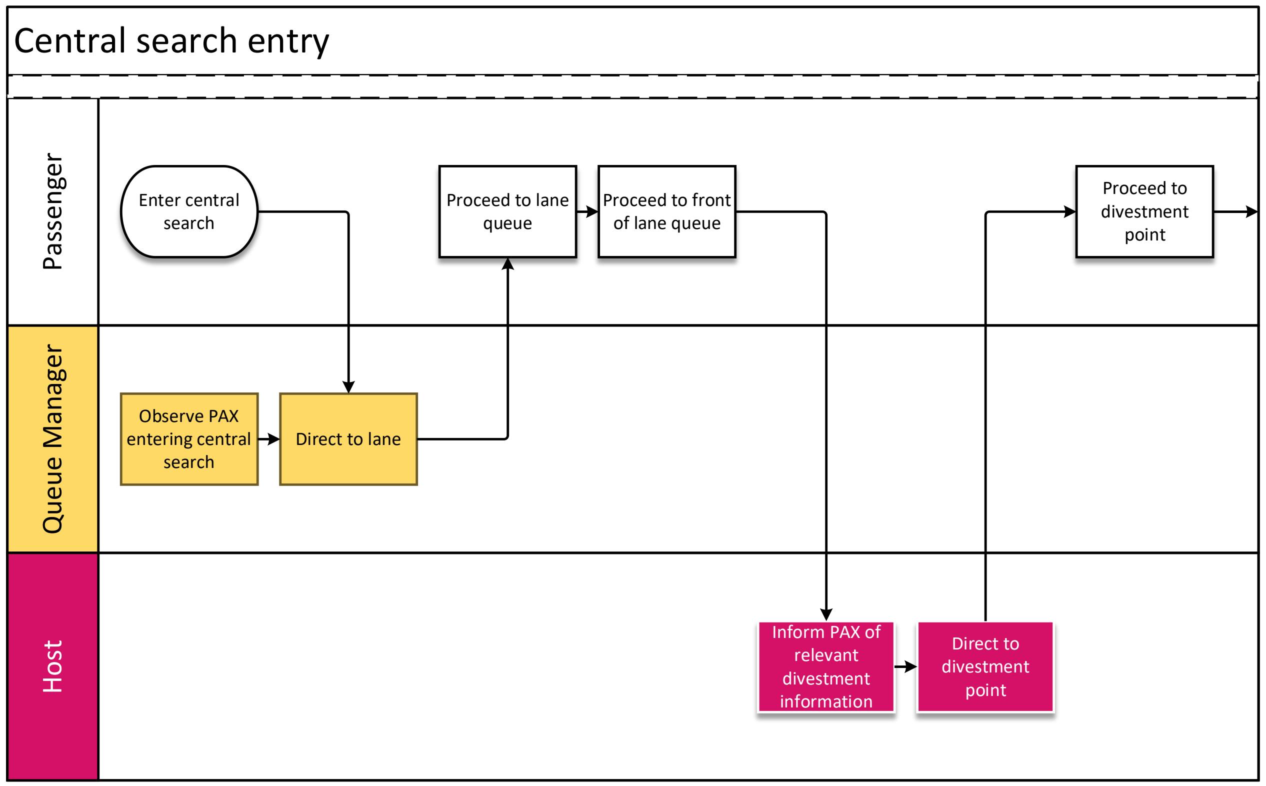
Potential process learnings

- There is potential for communication between queue managers and boarding pass scanners if queue managers have a better view of passengers requiring assistance.

Queue managers direct passengers to the appropriate lane to optimise queue times

In addition, lane hosts inform passengers of divestment requirements to reduce the number of CT scanner and body scanner alerts

Flow



Potential process fractures

- If passengers are not directed effectively, queues could become imbalanced, with some passengers queueing for significantly longer periods than others. This is important both for the management of lane and divestment position queues.
- Delays could also occur if ill-informed passengers divest incorrectly causing CT and body scanners alerts downstream.

Sub-process

- Passengers enter central search and are directed into a lane queue by one of two queue managers in the terminal.
- Once they reach the front of the queue the host informs passengers of necessary information and directs passengers to a divestment point.

Observations

- Small items in pockets are more likely to alert body scanners, which are more sensitive than AMDs, triggering manual searches.
- As the divestment requirements can change depending on the regulations in force, it is important to signpost requirements. This also helps passengers to understand the differences from other airports which often have different divestment requirements.

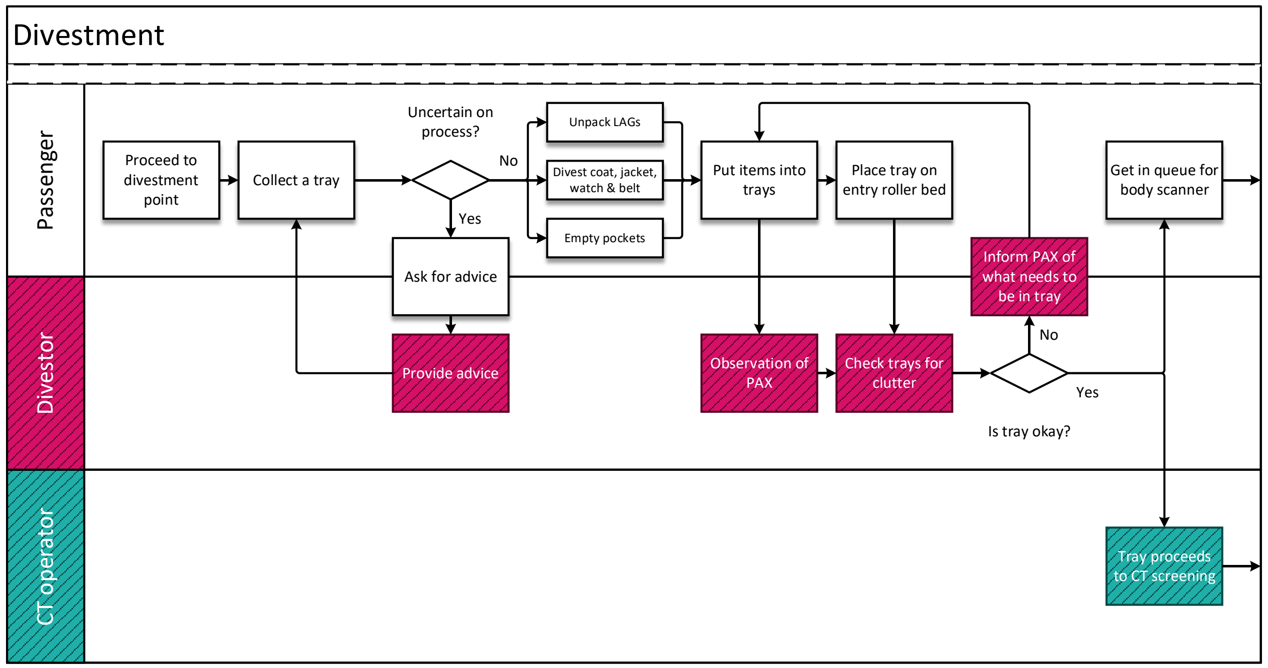
Potential process learnings

- Passengers should be apportioned between lanes according to lane performance, not simply divided equally.
- Additionally, feeding information on lane performance to the queue manager could enable better balancing between lanes.
- Use of divestment points also needs to be optimised to ensure no passengers are directed to points where they will have to wait significantly longer than other passengers.
- Hosts should clearly inform passengers of divestment needs early in the security process to reduce the occurrence of unnecessary alerts.

Divestors inform passengers of key divestment requirements to reduce delays

Passengers who are not adequately prepared for divestment are more likely to make mistakes, which can take staff longer to resolve and may result in time-consuming manual bag or body searches

Flow



Potential process fractures

- Passengers who take a long time to divest occupy divestment positions, which are especially limited on smaller lanes.
- Incorrect divestment by passengers will also lead to CT and/or body scanner alerts, resulting in time-consuming manual searches.
- Clogging of the entry roller bed will mean that passengers will not be able to proceed from the divestment area, occupying a divestment position while waiting to push their tray(s) onto the roller bed.

Sub-process

- Passengers proceed to a divestment point, where they collect trays and decant their belongings into them.
- This includes unpacking LAGs (at the time of observation but not necessary now), removing jackets, watches, belts, certain footwear and emptying pockets.
- Trays are then placed on the entry roller bed, proceeding to the CT scanner while the passenger goes to the body scanner waiting area.

Observations

- Incorrect divestment leads to passenger and hand baggage alerts triggering labour intensive and time-consuming manual searches.
- Divestment requirements are not static, driven by both technology and regulation. They also vary from airport-to-airport, so it is important passengers are made aware of the specific requirements in place.

Potential process learnings

- Divestment points need to be used efficiently, especially in lanes with limited space, highlighting the importance of informing passengers of the airport-specific divestment requirements as clearly as possible.
- Divestors should also support and advise passengers who appear to have missed any key steps in the divestment process.
- Informing staff on the most common divestment errors occurring that day would allow them to focus the guidance provided.

CT and body scanner operators evaluate bag and passenger images, identifying scans which require manual searches

Body scanner operators remain focused on their assigned lane, while CT scanners are matrixed, allowing CT scanner operators to support tray screening on other lanes where backlogs appear, if necessary

Flow

✂

Sub-process

- ✂
- ✂
- ✂
- ✂

Observations

- ✂
- ✂

Potential process fractures

- Backlogs could develop if the time taken for body scanning and bag screening are not balanced.
- If bags are being screened quicker than body scanning, then dieback will occur, collection of belongings being delayed.
- If body scanning is happening quicker than bag screening, the risk is crowding the reconciliation area.

Potential process learnings

- If a lane's body scanner is blocked by a manual search but the adjacent scanner is free, passengers can be directed to the free lane.
- Investigation into the balance between body scanner and bag screening throughputs could identify potential optimisations in the lane configurations. These optimisations may require additional staff however (e.g. adding an additional scanner per two lanes).

Manual body searchers support passenger flow by reactively directing passengers between body scanners

For example, if a male passenger is being manually searched in one lane, then other male passengers should be directed to the scanner in the adjacent lane if the male manual body searcher is available, keeping the flow moving

Flow

Sub-process

Observations

Potential process fractures

- Delays can be driven by gender specific search requirements, for example, if there are no male body searchers available as they are already conducting manual searches, then other male passengers may not be able to pass through the body scanner, stopping the passenger flow.
- Putting items back through the CT scanner (e.g. shoes, belt) disrupts the bag flow and keeps the manual searcher occupied during the scanning, halting PAX flow. This will have an impact on both passenger flow and bag flow.
- The alternative is to perform longer manual searches which will avoid impacting bag flow but potentially holds up the passenger flow even more.

Potential process learnings

- Processes should be reactive: if manual searches are the bottleneck, items should be re-scanned, if the scanner is the bottleneck, a manual search should be carried out.
- A secondary shoe detection system could be deployed in each lane to help manage potential manual search bottlenecks.
- If a male passenger search is ongoing then female passengers should be prioritised through the body scanner. If the adjacent scanner is free, male passengers can be directed to the free lane to keep the queue moving.
- The lane troubleshooter could also support manual searches.

Manual bag searchers manage bags on the manual bag search roller to avoid dieback

Lane trouble shooter can step in to support manual searches, but are limited by the number of manual bag search positions on each lane

Flow

✂

Potential process fractures

- A key bottleneck with the manual bag search is the risk of dieback, where the number of bags waiting for a manual search extends backwards as far as the point where bags are diverted for manual search.
- This occurrence blocks any further bags from being scanned, even if they would not trigger a manual bag search. CT scanning then comes to a halt.
- This could mean that the reconciliation area becomes full, with passengers unable to collect their trays even though they have already been processed.

Sub-process

- ✂
- ✂
- ✂
- ✂

Observations

- ✂
- ✂

Potential process learnings

- The lane troubleshooter can step in to support the process, but if there are large queues then there is likely to be several bottlenecks in the security operation (e.g. at manual passenger search) that would benefit from support.
- As such, it may be worth deploying an additional lane troubleshooter during peak times, having 1 per lane as opposed to 0.5, to allow for the support of the bag search even when other parts of the operation are busy, although this is likely to be limited by the lane infrastructure with only two manual bag search positions per lane.

Lane troubleshooters help keep the exit roller bed clear by directing passengers away from the area quickly

Passengers may otherwise repack their belongings on the exit roller bed which could stop other passengers from gathering their belongings and cause dieback

Flow

✂

Sub-process

- ✂
- ✂
- ✂
- ✂

Observations

- ✂

Potential process fractures

- Passengers who repack bags on the exit roller bed risk causing dieback to the CT scanner, which can cause a knock-on effect where passengers are crowding the exit roller bed waiting for their bags.

Potential process learnings

- Lane troubleshooters need to actively ensure that reconciliation is occurring away from the exit roller bed.
- To allow them to keep doing this while also managing their other responsibilities effectively, an additional troubleshooter per two lanes may be beneficial.
- The size of the current bag reconciliation area should also be reviewed to determine if it is sufficient during peak times.

Exception processes

This sub-section describes the exception process in detail step-by-step using the following structure

- **Exception process**
  - Entry
  - Divestment
  - Scanning
  - Manual search
  - Reconciliation

Families can cause queues to build up by blocking divestment areas, especially those with younger children

To avoid families stopping the flow of passengers behind them, families should be directed to specific lanes or to a single divestment point, although this can be flexible based on group size

Flow

✂

Potential process fractures

- Larger families could clog an entire lane if they use multiple divestment areas.
- Families are also likely to be more distracted than standard passengers, and therefore take longer, as responsible adults must look after children while also unpacking bags.
- If some family members require assistance from others, then this would further extend the time that these passengers occupy the divestment area.
- Families may also be more likely to be carrying items that will need to undergo additional screening (as outlined in the LAG exception process map) which will take additional time to unpack.

Sub-process

- ✂
- ✂
- ✂

Observations

- ✂

Potential process learnings

- Families could be directed to 'family friendly' lanes, where staff and infrastructure are better able to cope with their additional needs. This could be judged based on the family size and the children's ages.
- Alternatively, directing families to one divestment slot may help avoid disruption to the whole lane, allowing other passengers to use the other divestment slots.
- While this will cause the single divestment slot to be occupied for a longer period, it will allow passengers to continue to flow, reducing the risk of this becoming a bottleneck.

Keeping family units together during scanning is likely to make the process more efficient

Time can be saved avoiding discourse between staff and passengers on scanning preferences and avoid staff having to juggle different scanning requirements for a single family

Flow

✂

Potential process fractures

- Ambiguity in the process for small children getting scanned can lead to time consuming discourse between staff and passengers.
- A responsible adult must always stay with their child, but depending on the size of the child, a child may not be able to use the body scanner. If the adult still decides to use the body scanner this would require both the adult and child to wait at each scanner type for scans to be completed, which would be inefficient.
- For larger groups this could be preceded by discussion over which responsible adult will go with children below one metre tall while another stays with other children using the body scanner.

Sub-process

- ✂
- ✂
- ✂

Observations

- ✂
- ✂

Potential process learnings

- When families include a child shorter than one metre tall, it would be efficient to direct families as a unit to use the AMD so there is not a fracture in the process between the responsible adults and children.
- Having this as a clear, well-defined process would also limit any delays because of discussion between passengers and staff.
- This would also be more efficient if a manual search needs to be conducted, as the responsible adult would already be in attendance for the search.

Manual searches of children generally take longer than a typical search so extra effort should be taken to avoid these if possible

Ensuring children have removed everything from their pockets and are fully prepared for scanning will help to reduce the number of manual searches required

Flow

Potential process fractures

- Children are more likely to forget to remove items that are likely to set off a body scanner, for example, hairclips or small items in pockets.
- A child search is expected to take longer than a standard search as children will be unfamiliar and likely more nervous and awkward about being searched.

Sub-process

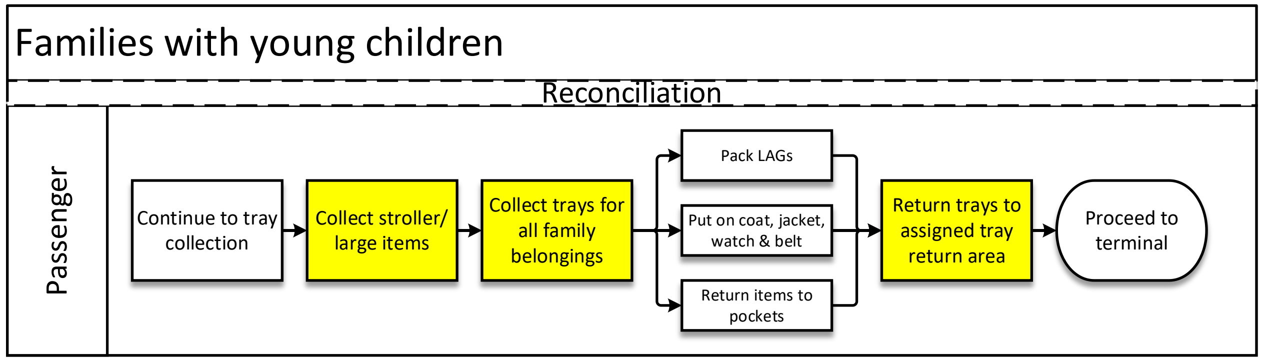
Potential process learnings

- To avoid delays host and divestors should dedicate extra effort to make sure that children take everything out of their pockets, remove belts etc.
- The extra time spent doing this will likely save time overall by reducing the number of required child searches.

Families are likely to take up more space on the exit roller and crowd the reconciliation area

Lane troubleshooters should step in to help support families at this stage and then shepherd them towards the terminal as quickly as possible

Flow



Potential process fractures

- Families would be expected to take up a lot of space at bag reconciliation or, worse, at the exit roller bed, although this will depend on the size of the group and the age of families.
- They would likely have a larger number of bags, as well as having children who are likely nervous or bored by the security process.
- Families may also stay within the area waiting for other family members going through the security process (e.g. grandparents) and could take up a lot of space, making the reconciliation process more difficult for other passengers.

Sub-process

- For young children it is assumed that their responsible adult would repack their belongings.
- Families may also need to collect a stroller which would have been scanned separately to other belongings.

Potential process learnings

- It might be beneficial here for the lane troubleshooter to help relocate family trays from the exit roller as quickly as possible.
- By helping them move along quickly it would help ensure they are not taking up space causing a backlog for bag reconciliation or causing people to unpack from the exit roller.

High risk bags require significant staff input and could cause panic among passengers if managed poorly

The process for high-risk bags should be followed calmly to avoid causing panic to any other passengers around security

Flow

✂

Potential process fractures

- This process has the potential to cause delays but also panic.
- If passengers become panicked, they will likely be harder to manage and could also increase staff workload with additional questions.
- If more than one high risk bag is identified at the same time and there is no process to deal with this, staff may struggle to deal with this in a timely manner. For example, if there is no one to take the role of the supervisor while they are conducting an interview then this may halt lane operations.

Sub-process

- ✂
- ✂
- ✂
- ✂

Potential process learnings

- It is important that staff remain calm and composed as causing other passengers to panic will make all other processes more time consuming and difficult to complete.
- Having a clear process and then following training for this process regularly would help staff remain composed in real high-risk alerts.

Passengers with different scanning requirements take up more staff time than the standard process

Opting out of scanning
- Entry
- Divestment
- **Scanning**
- **Manual search**
- Reconciliation

Allowing passengers to communicate their needs ahead of time and passing this information to security would help staff be more prepared when passengers cannot/choose not to use body scanners or AMDs

Flow

✂

Potential process fractures

- Passengers who ask to use an AMD will require staff to be diverted from body scanner operation to both set-up and run the AMD (if it is not part of the current lane configuration). This will require significant staff time, especially if a manual search is then needed, reducing the throughput of the body scanners for the duration.
- Passengers who cannot use any scanner will require a manual search, occupying a manual body searcher for a long time.

Sub-process

- ✂
- ✂
- ✂
- ✂

Potential process learnings

- Having information on passengers needs ahead of time would allow staff to be better prepared to deal with them efficiently.
- While this would likely be collected by the airline or the airport, it may not be communicated to security.
- Communication of the arrival of these passengers could allow for the placement of additional staff and give additional time to sort any required equipment.
- This could be triggered at the boarding pass scan, with a trigger attached to the boarding pass of passengers who provided this information in advance.
- This could also allow individuals to be directed to a specialised lane which is better equipped to deal with such needs.

PRM/wheelchair users can meet with a pre-booked assistance team support member to help them through the security process

Communication with the airport/assistance support team passengers who book this service could help security have an earlier awareness of when passengers with additional support needs arrive

Flow

Potential process fractures

- PRM/wheelchair users who are unaware of the support available could struggle in the security process and require attention from lane staff.

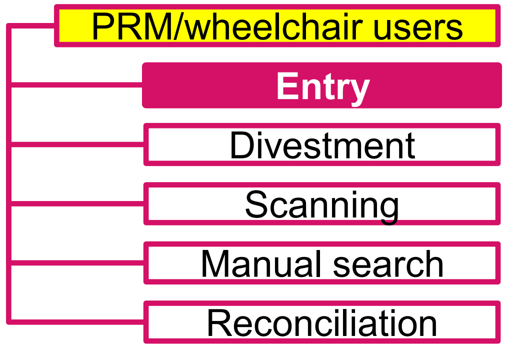
Sub-process

Potential process learnings

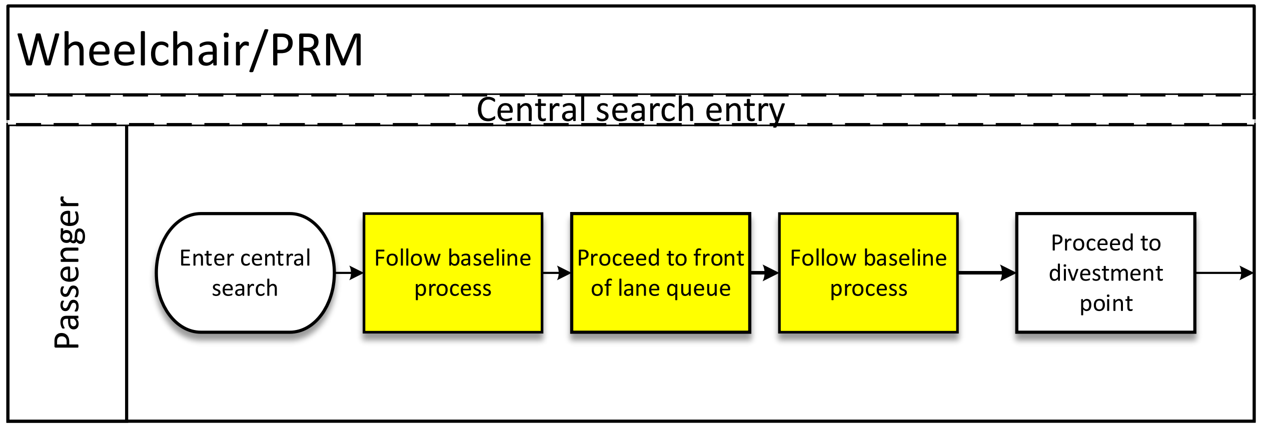
- Making sure the queue managers are proactive with identifying any passengers who appear to be struggling/unaware of potential support will allow them to potentially offer additional assistance to PRM/wheelchair users without support staff who may need help.
- As with passengers unable to use AMDs or body scanners, having information provided to security ahead of time would allow staff to be better prepared to deal with the needs of passengers.
- This could also be triggered at boarding pass scan when a PRM/wheelchair user scans their ticket.

The needs of PRM/wheelchair users mean that they will require additional attention from staff

Opening dedicated lanes or prioritising certain lanes for PRM/wheelchair passengers may increase efficiency if dealing with complex passenger requirements



Flow



Potential process fractures

- PRM/wheelchair passengers could arrive as large groups (e.g. charity trips) which may result in high staff demand across all roles.
- If terminals are busy, it may be difficult for PRM/wheelchair users to navigate to the front of the lane queue, which could then require opening of a new lane to accommodate these passengers.
- This would take time to set up a lane and require many additional staff.

Sub-process

- Upon entering central search, certain PRM/wheelchair passengers are directed to proceed straight to the front of lane queues.

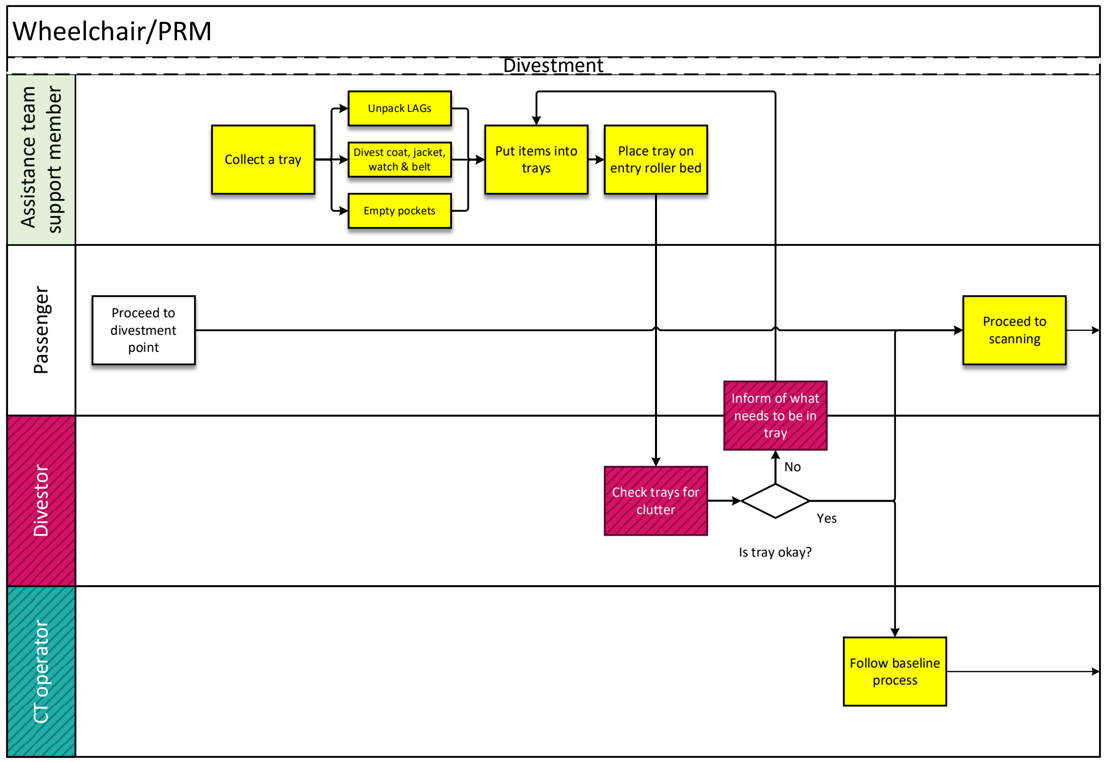
Potential process learnings

- At certain times it may be beneficial to send all such passengers to a single queue or fast track.
- Another option is to have a designated lane, which could either be the current queue in each terminal with the widest lanes or a lane that could be further specialised to be best suited to deal with the complexity of processing these passengers.
- It would also be beneficial to liaise with the airlines and the PRM support team to know when big groups will be traveling together so that a dedicated lane could be opened specifically for them.
- This process may also provide increased efficiency when dealing with schools/sports teams.

PRM/wheelchair passengers with support staff need less guidance than others as the staff are familiar with the process

This means other staff such as divestors can focus more on other passengers who do not have assistance and are more likely to make mistakes

Flow



Potential process fractures

- Staff may invest time explaining divestment requirements to passengers who already have support who can assist with this matter.

Sub-process

- The bag drop process will be followed much like in baseline, except in some cases the assistance team support member would support in the unpacking of belongings.

Observations

- This process may be more efficient than for a standard passenger, as the assistance team support member would be more familiar with the rules and requirements for the decanting of belongings.

Potential process learnings

- Divestors and hosts should focus their attention on other passengers at this stage.

PRM/wheelchair users will have different scanning requirements which can increase the number of staff responsibilities

Earlier awareness of requirements could help staff better prepare, while specialised lanes may help staff better manage passengers with different scanning needs

Flow

Potential process fractures

- Scanning for PRM and wheelchair users will take longer than with a standard passenger.
- For wheelchair users that need to stay in their wheelchair and are also unable to use the AMD, swabbing of a passenger's wheelchair will need to happen sequentially rather than simultaneously, taking additional time.

Sub-process

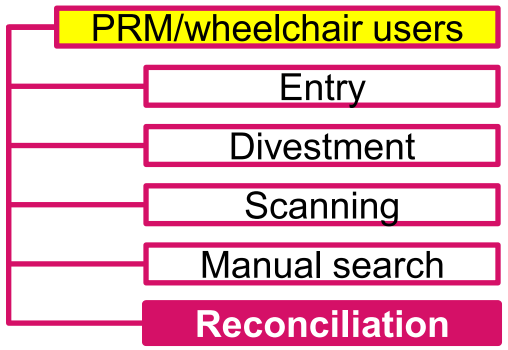
Observations

Potential process learnings

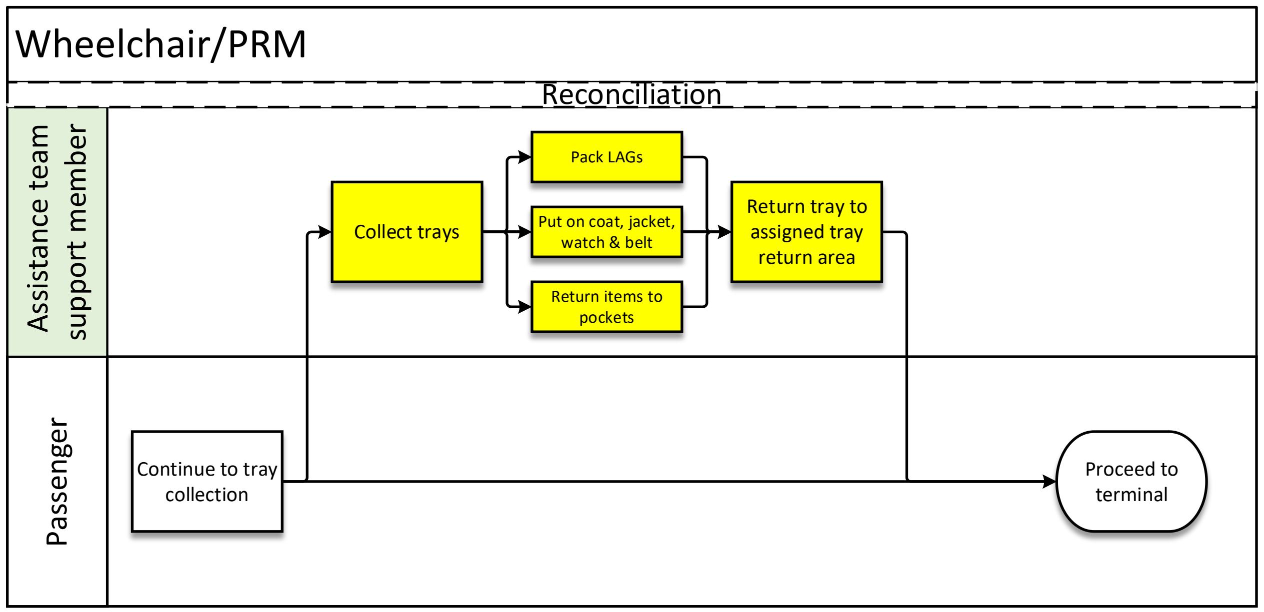
- Having awareness of the needs of passengers ahead of time allow staff to prepare for this process efficiently, having the appropriate technology ready before the passenger arrives at the lane.
- Specialised lanes in each terminal could also improve throughput during peak times, with staff more prepared to carry out additional tasks such as swabbing of wheelchairs. This should ideally be done in lanes with more space available to make it easier to accommodate for these tasks.

PRM/wheelchair users with a support team member will need more space at reconciliation compared to other passengers

The assistance team will sometimes be responsible for reconciliation but could be supported by lane troubleshooters



Flow



Potential process fractures

- As with families, PRM/wheelchair users would be expected to take up more space than a standard passenger at bag reconciliation.

Sub-process

- Like bag drop, the assistance team support member may support the repacking of bags for the PRM/wheelchair user.
- The process would otherwise proceed according to the baseline.

Potential process learnings

- It might be beneficial for the lane troubleshooter to further support in the relocation of trays from the exit roller and to help the passenger proceed to the terminal as quickly as possible.

4

Conclusions

Process map analysis highlighted potential improvements such as increasing the number of lane troubleshooters and clarifying divestment requirements

These process observations indicate areas Dublin Airport could test to improve throughput or resilience. They do not, on their own, determine the efficient opex allowance

Raising awareness about airport and technology specific requirements will save time spent on manual search

- Ensuring passengers are provided with all relevant information will help to avoid excess searches and improve passenger efficiency.
  - Clarifying that pockets need to be completely empty before using the new body scanners will reduce alerts as it is a requirement which not all passengers will be familiar with.
  - This is particularly important for families and young children, as these groups take longer to search while also occupying more space than regular passengers.
  - Passengers should be informed of these requirements throughout their journey: by the host when reaching the front of the lane queue; by the divestor when unloading bags; and by the body scanner operator before being beckoned into the body scanner.

Clarifying the process on manual searches could allow for improvements in lane efficiency

- Delays driven by gender specific search requirements can be avoided by prioritising passengers whose gender matches an available manual body searcher, as opposed to halting the whole queue when any manual search is taking place.
- A secondary shoe detection system could also be deployed in each lane to reduce the need to put items back through the CT scanner (e.g. shoes, belt).

Lane troubleshooters appear an effective way to alleviate the variety of bottlenecks that can appear within lanes

- Lane troubleshooters should be active in identifying groups that are likely to take up significant space in the reconciliation area (such as families or PRM passengers) and support where possible to move these passengers along quickly.
- The lane troubleshooter could be deployed to support the manual searchers when they are busy, but this risks overloading the lane troubleshooter with responsibilities.
- To avoid this, the number of lane troubleshooters could be increased from 0.5 per lane to 1 per lane at peak times.

Communicating with passengers and other relevant parties ahead of time will help staff deal with the passenger’s needs

- This may involve communication with airlines or PRM companies to obtain this information in advance of passenger arrival.
- Requirements such as wheelchair swabbing or use of an AMD could then be attached to a boarding card, allowing security to know when these requirements will arise.
- Security can use this information to prepare for the passenger in advance, such as by opening a specialised lane or preparing an AMD scanner, providing a smoother experience for the passenger and increasing security efficiency.

A

Appendix

The baseline process map outlines the flow of passengers and hand baggage through each of the steps of security screening

Families are bigger groups than standard passengers, with a responsible adult often having responsibilities to support children across a number of stages

Bags flagged as high-risk involve a supervisor in the scanning process as well as the police if supervisor determines this is necessary

Opting out of body scanning process can involve a passenger instead using an AMD or going straight to a manual passenger search

Wheelchair/PRM passengers can be supported by an assistance team support member who takes on several passenger responsibilities within the process

OFFICES

Think Research,
6 Branksome Park House,
Bourne Valley Road,
Bournemouth,
Dorset, BH12 1ED

Think Research,
Office 168- 169,
The Hub, Fowler
Avenue, Farnborough
Hampshire, GU14 7JF

Think Research QFZ,
Business & Innovation Park,
Unit 4104, Wing 4, Level 1,
Building 1, Street 504,
Zone 49, Doha, Qatar

think-research-ltd

economics matters