ACI membership & regional offices

ACI World
Montreal, Canada

ACI Europe
Brussels, Belgium

ACI North America
Washington, DC

ACI Asia-Pacific & Middle East (sub-office)
Riyadh, Saudi

ACI Africa
Casablanca, Morocco

ACI Asia-Pacific & Middle East
Hong Kong, China

ACI Latin America-Caribbean
Panama City, Panama

717 members   **1,950** airports   **185** countries and territories

ACI
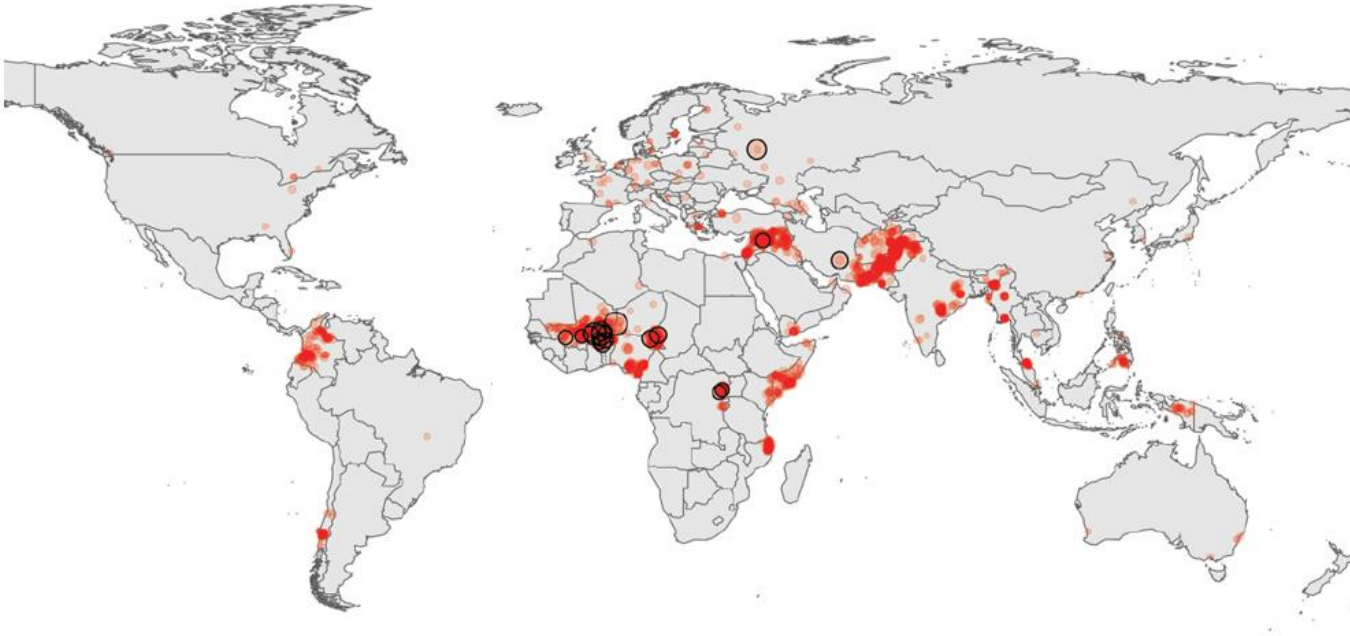AIRPORTS COUNCIL INTERNATIONAL

Air passenger traffic has surpassed 2019 level for all regions

2019 traffic level

Civil aviation still remains an attractive target for terrorists

### Fatal terrorist attacks in 2024 (all types)

Reported AUIs against civil aviation

- 57 AUIs in 2022

- 60 AUIs in 2023

- **96** AUIs in 2024
  - 9 attacks on aircraft
  - 10 on aviation facilities (e.g. airports)
  - 1 on comms sytems
  - 72 others

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Perpetrators are constantly looking for the weakest link
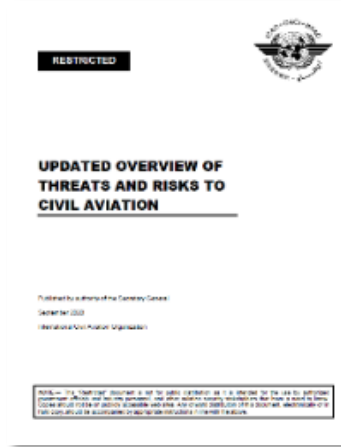
Constant update of ICAO Risk Context Statement (RCS)
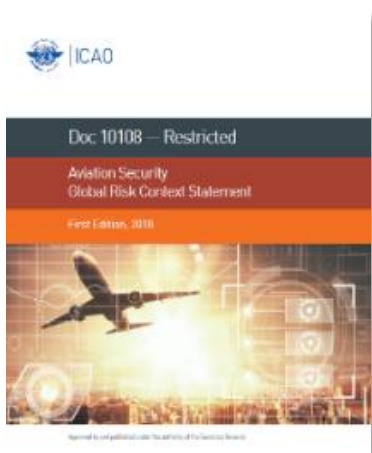
1st edition (2018)

2nd edition (2019)

Interim update (2020)

3rd edition (Dec 2022)

4th edition (soon, TBC)

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**Asia-Pacific &
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ACI Regional Aviation Security Committee

39 committee members, representing over **200** individual airports

Top 4 concerning threats for airports in the region

Drones

Landside

PB-IED & explosives

Cyber

Landside attacks becoming frequent in the past decade

Glasgow (2007)

Moscow (2011)

Istanbul (2016)

Brussels (2016)

Shanghai(2017)

Fort Lauderdale (2017)

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ICAO strengthened landside security in July 2017

(New) 4.8.1 (standard)

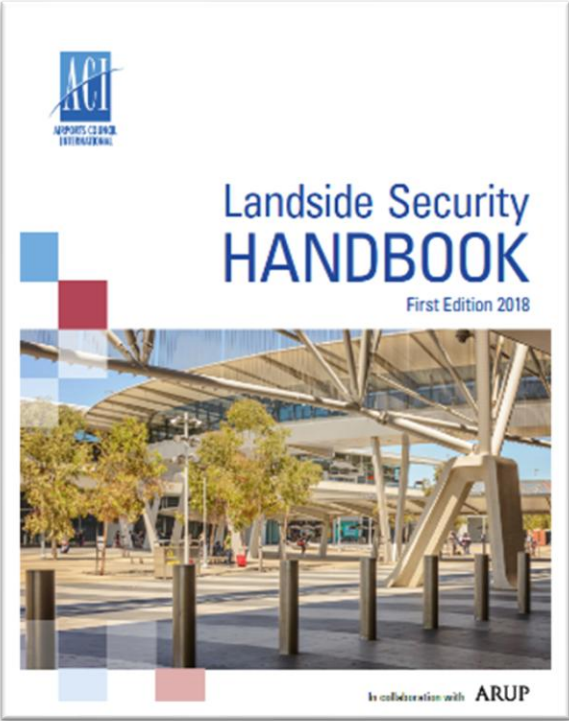.... shall ensure that landside areas are **identified**

(Upgrade) 4.8.2 ~~Recommendation~~ (Standard)

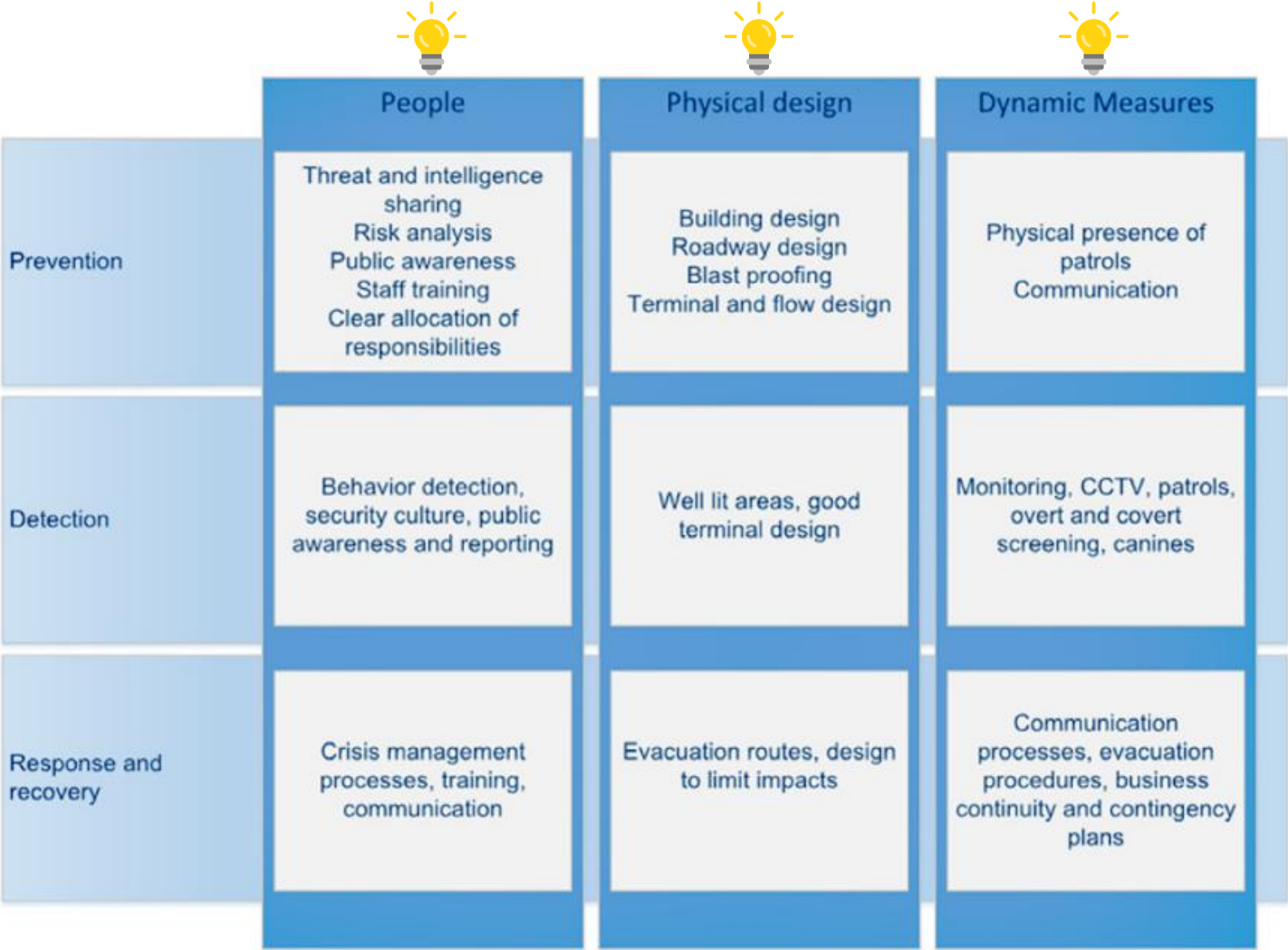....shall ensure…. security measures in landside areas are **established**....

(Upgrade) 4.8.3 ~~Recommendation~~ (Standard)

….shall ensure **coordination** of landside security measures……...

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Comprehensive approach developed for landside risk mitigation

ACI Landside Security Handbook

	People	Physical design	Dynamic Measures
Prevention	Threat and intelligence sharing Risk analysis Public awareness Staff training Clear allocation of responsibilities	Building design Roadway design Blast proofing Terminal and flow design	Physical presence of patrols Communication
Detection	Behavior detection, security culture, public awareness and reporting	Well lit areas, good terminal design	Monitoring, CCTV, patrols, overt and covert screening, canines
Response and recovery	Crisis management processes, training, communication	Evacuation routes, design to limit impacts	Communication processes, evacuation procedures, business continuity and contingency plans

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Measures: More advanced solutions are deployed for landside security

Explosives K9 team

Security robot

Crowd monitoring tools

ANPR & road blocker system

Advanced CCTV with behaviour analysis

Autonomous patrol car

Body camera

PIDS

People: Airports are doing more to train up its staff

Security exercises for landside attack

Dedicated trainings for crowd management

Security awareness campaign

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Design: Airport design incorporating landside security elements

Courtesy of Montevideo Airport

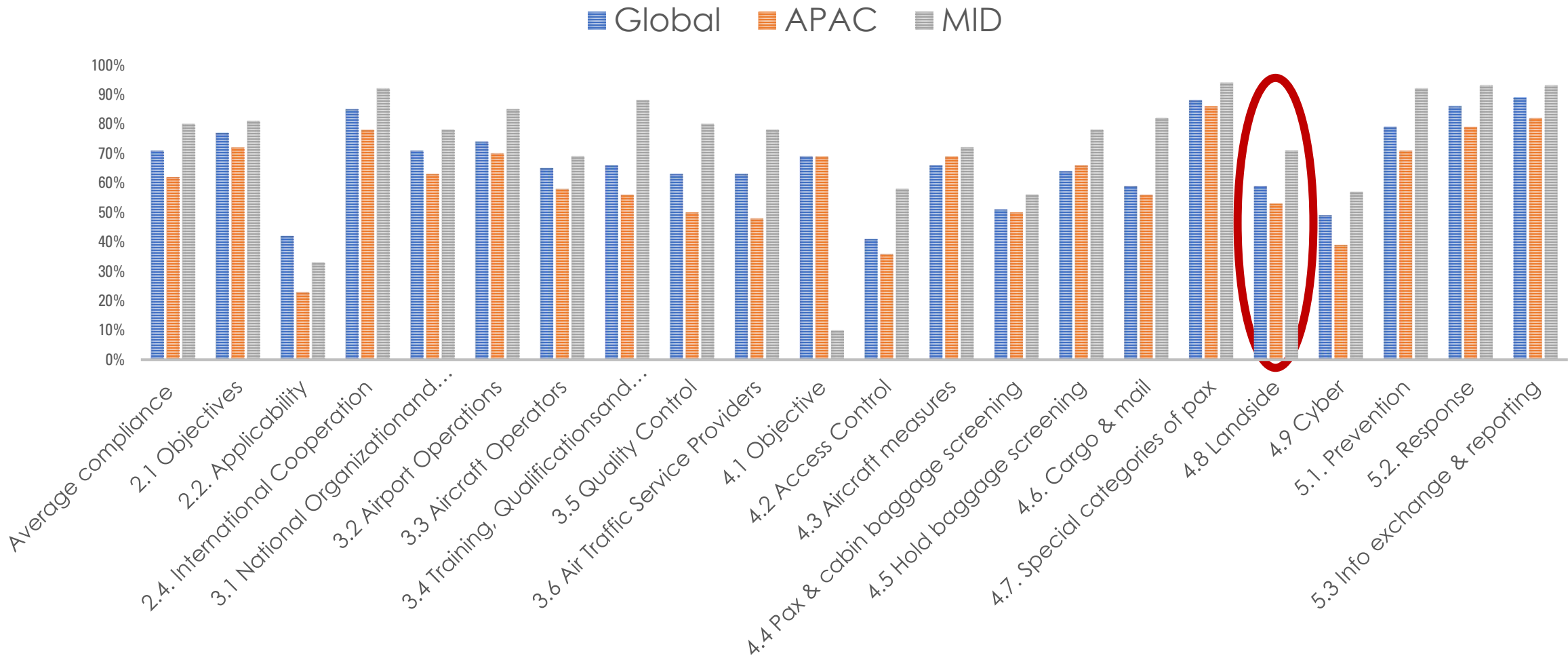Courtesy of Changi Airport

Courtesy of Atlanta Airport

Courtesy of Adelaide Airport

Landside continues to be one of the least-complied areas

USAP Results – Compliance with Annex 17

Common airports' challenges on landside protection

1) **Design & space constraint**
   o e.g. limited stand-off distance, gathering of crowds
2) **Risk assessment**
   o e.g. ineffective risk assessment for landside
3) **Stakeholder coordination**
   o e.g. ineffective communication between stakeholders for emergency response
   o e.g. balance of SEC & FAL
4) **Vulnerability to vehicle attacks**
   o e.g. limited hostile vehicle mitigation, ineffective unattended vehicle procedures
5) **Perimeter protection**
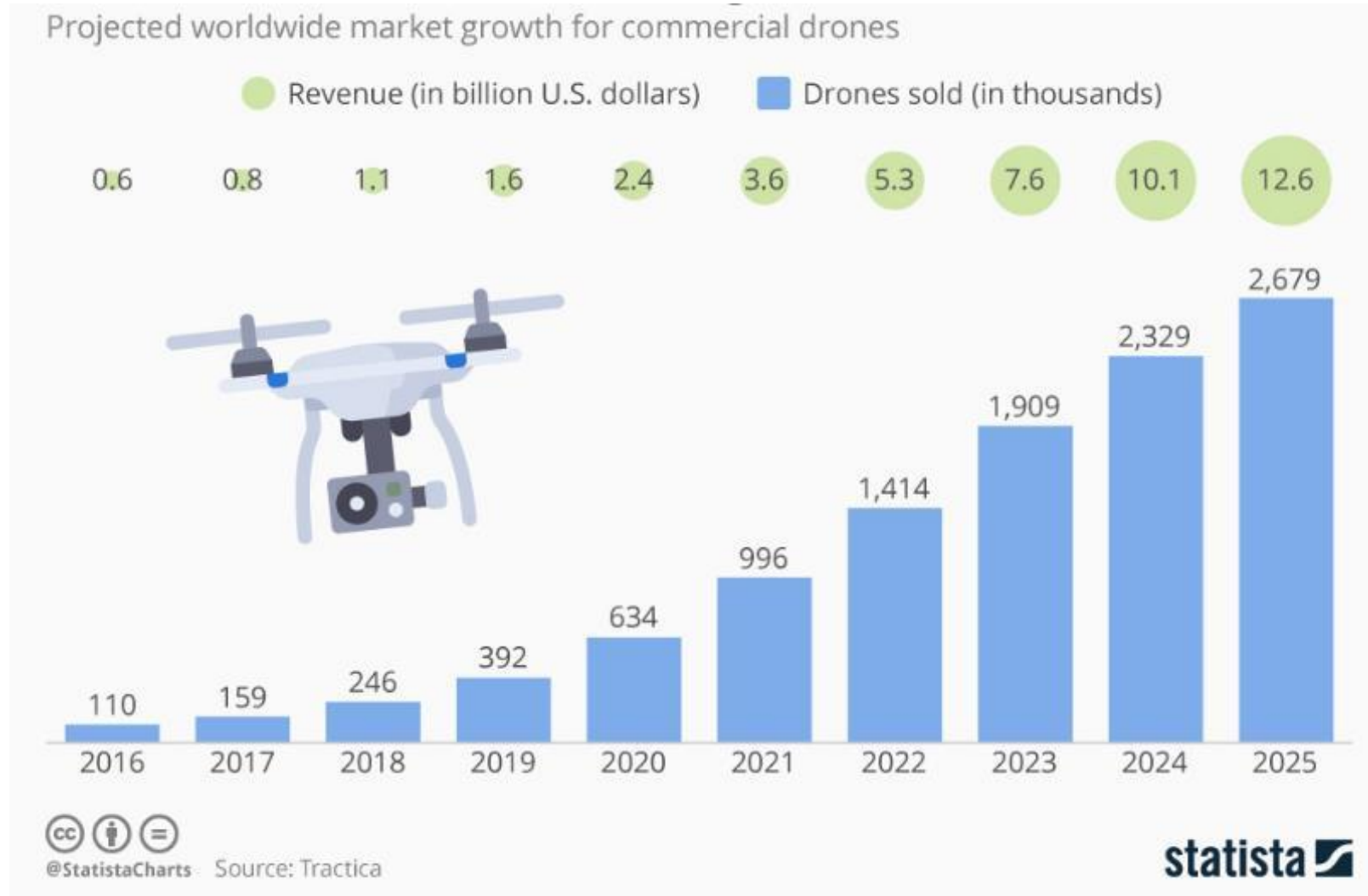   o e.g. unclear landside boundary, poor maintenance of fence
6) **Landside surveillance**
   o e.g. insufficient CCTV coverage and landside patrolling
7) **Facilitation**
   o e.g. balance of SEC & FAL

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**Asia-Pacific &
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Use of drones are growing exponentially

Projected worldwide market growth for commercial drones

● Revenue (in billion U.S. dollars) ■ Drones sold (in thousands)

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
0.6	0.8	1.1	1.6	2.4	3.6	5.3	7.6	10.1	12.6
110	159	246	392	634	996	1,414	1,909	2,329	2,679

@StatistaCharts Source: Tractica

statista

The Voice of
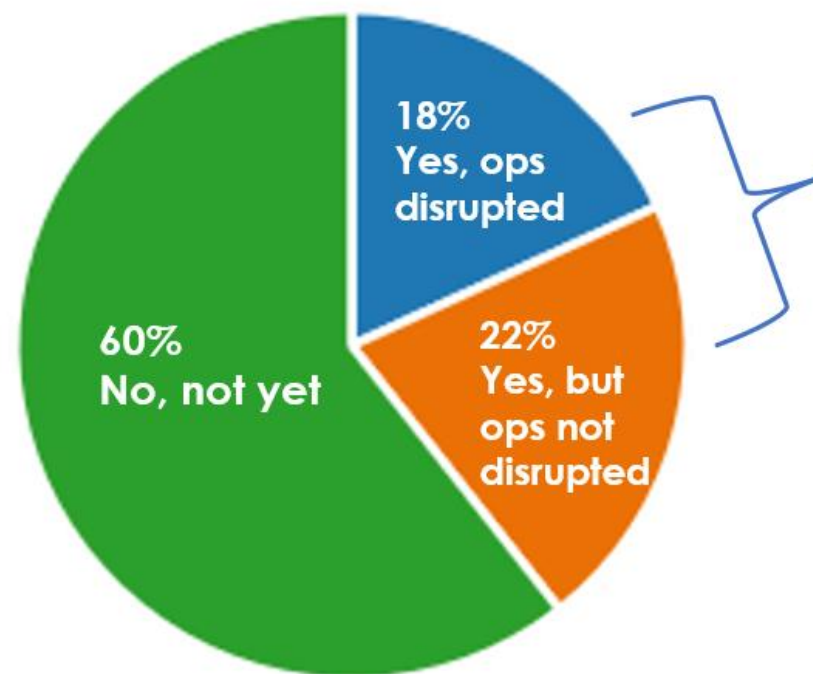**Asia-Pacific &
Middle East** Airports

Rising unauthorized drone intrusions at airports

Gatwick Airport drone incident

- Airport closed 19-21 Dec 2018
- 140,000 pax and 1,000 flights affected
- Costed estimated $64.5M for airlines

Drone intrusion in the region?

18%
Yes, ops disrupted

22%
Yes, but ops not disrupted

60%
No, not yet

40% have experienced unauthorized intrusions of drones

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**Asia-Pacific &
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The risk of UA attacks has been elevated multiple times
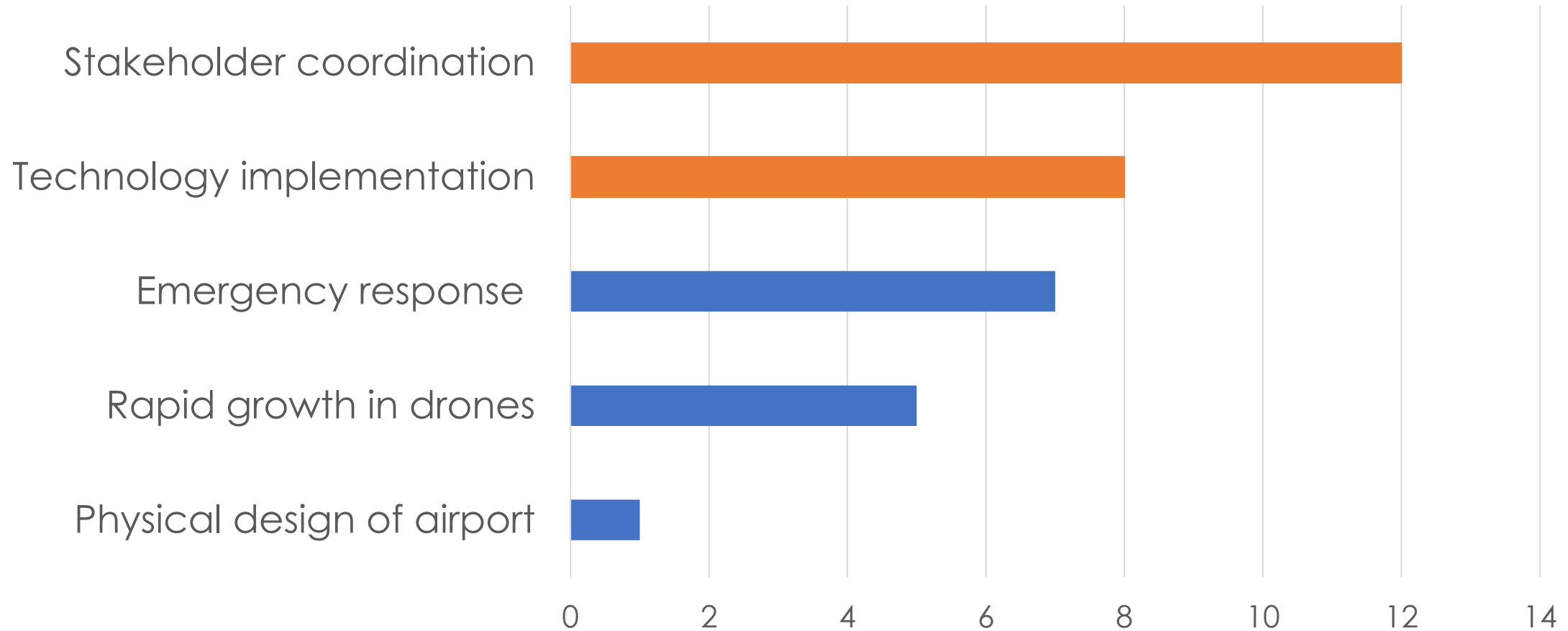

MEDIUM-HIGH

MEDIUM

MEDIUM-LOW

2022 (RCS 3nd edition)

2019 (RCS 2nd edition)

2018 (RCS 1st edition)

What are the major challenges for airports

*Based on responses from 40 airport operators

Protection responsibility varies across countries

Who is involved?

- Airport operator
  - Airport security
  - Airfield operations
- Air traffic control
- Airline
- Police /Law enforcement
- CAA
- Intelligence agency
- C-UAS solution provider

Who is taking the lead in protection?

- Airport 28%
- CAA 28%
- Police/Law E 34%
- ATC 7%
- Ohters 3%

*Based on responses from 40 airport operators

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Asia-Pacific &
Middle East Airports
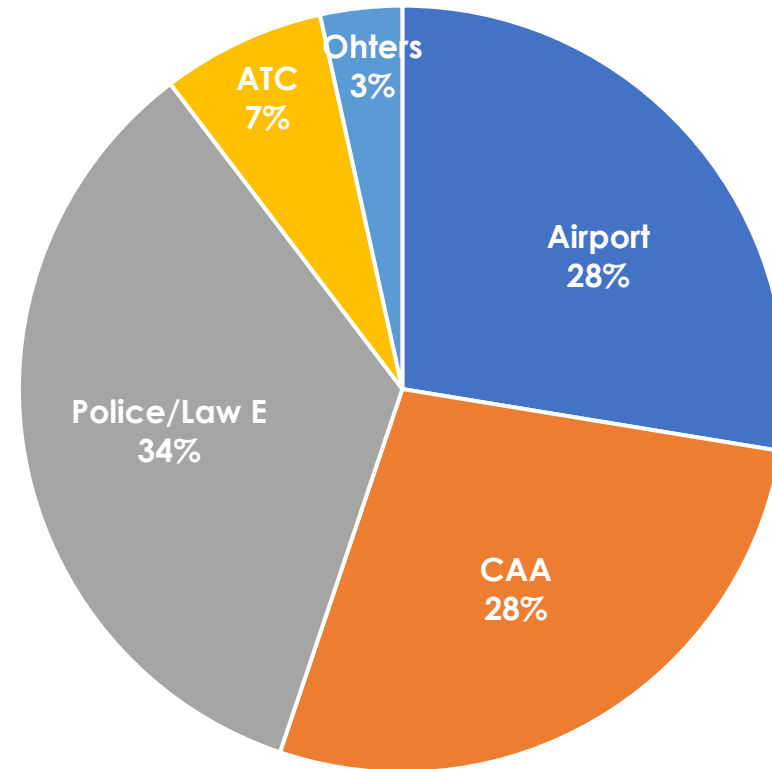
Growing deployment of anti-drone technology at airports

Anti-drone technology installed yet?
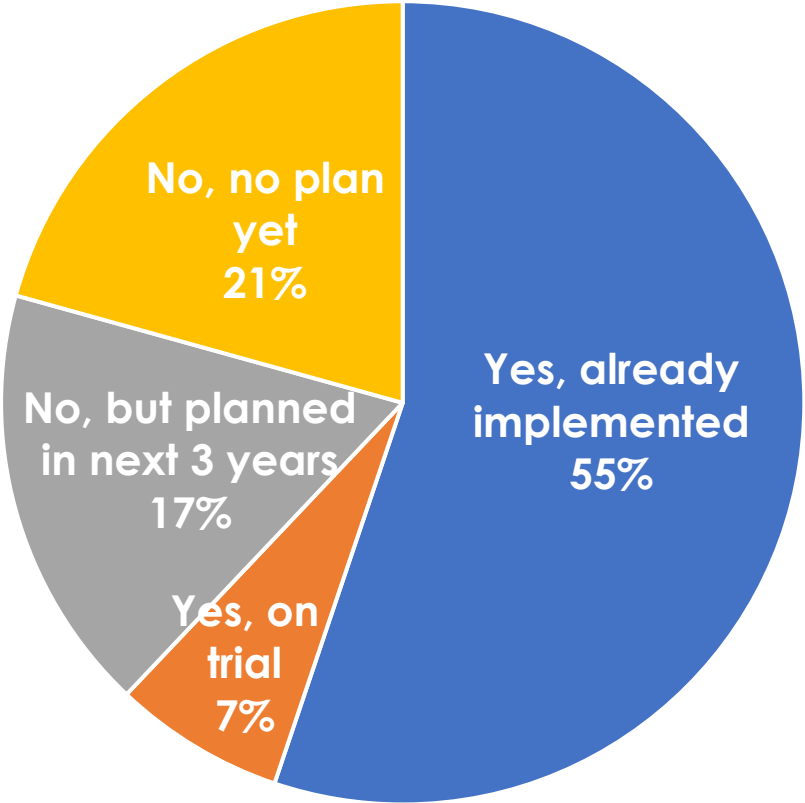
Yes, already implemented 55%

No, no plan yet 21%

No, but planned in next 3 years 17%

Yes, on trial 7%

Examples of technology

For detection/tracking

Radars

Radiofrequency scanners

Daylight/thermal cameras

Acoustic sensors

For interception/neutralization

RF jammers

Spoofing

Deployable nets
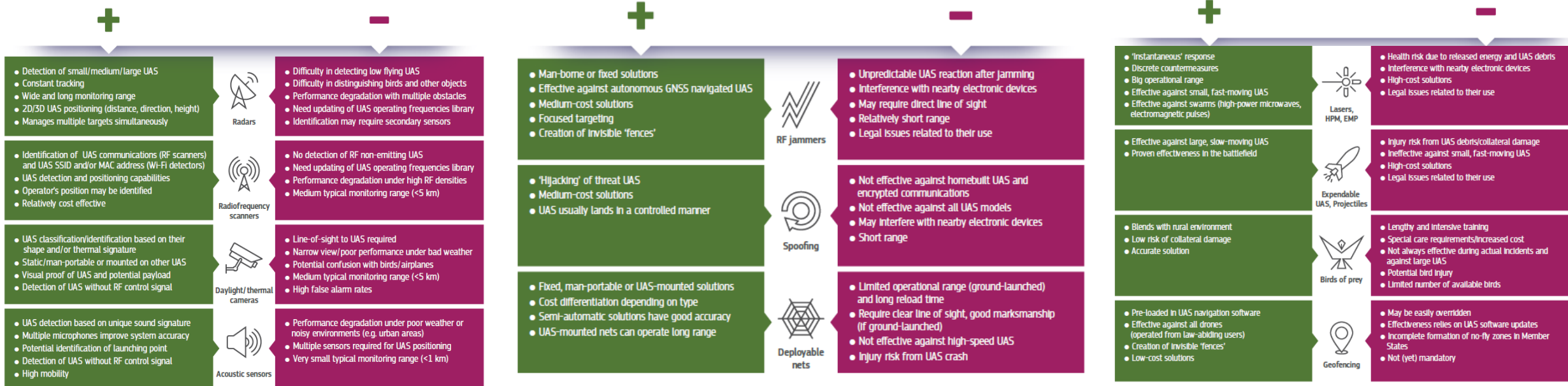
Lasers, HPM, EMP

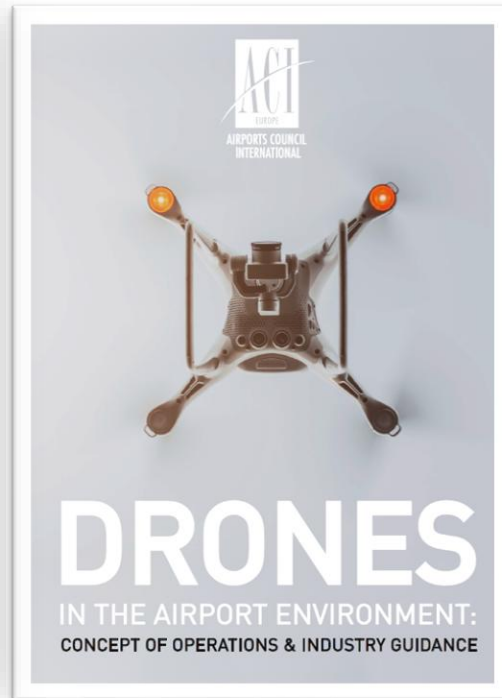Expendable UAS, Projectiles

Birds of prey

Geofencing

*Based on responses from 40 airport operators

No perfect technological solution for now

Detection Technologies

Radars
+
- Detection of small/medium/large UAS
- Constant tracking
- Wide and long monitoring range
- 2D/3D UAS positioning (distance, direction, height)
- Manages multiple targets simultaneously

−
- Difficulty in detecting low flying UAS
- Difficulty in distinguishing birds and other objects
- Performance degradation with multiple obstacles
- Need updating of UAS operating frequencies library
- Identification may require secondary sensors

Radiofrequency scanners
+
- Identification of UAS communications (RF scanners) and UAS SSID and/or MAC address (Wi-Fi detectors)
- UAS detection and positioning capabilities
- Operator's position may be identified
- Relatively cost effective

−
- No detection of RF non-emitting UAS
- Need updating of UAS operating frequencies library
- Performance degradation under high RF densities
- Medium typical monitoring range (<5 km)

Daylight/thermal cameras
+
- UAS classification/identification based on their shape and/or thermal signature
- Static/man-portable or mounted on other UAS
- Visual proof of UAS and potential payload
- Detection of UAS without RF control signal

−
- Line-of-sight to UAS required
- Narrow view/poor performance under bad weather
- Potential confusion with birds/airplanes
- Medium typical monitoring range (<5 km)
- High false alarm rates

Acoustic sensors
+
- UAS detection based on unique sound signature
- Multiple microphones improve system accuracy
- Potential identification of launching point
- Detection of UAS without RF control signal
- High mobility

−
- Performance degradation under poor weather or noisy environments (e.g. urban areas)
- Multiple sensors required for UAS positioning
- Very small typical monitoring range (<1 km)

Mitigation Technologies

RF jammers
+
- Man-borne or fixed solutions
- Effective against autonomous GNSS navigated UAS
- Medium-cost solutions
- Focused targeting
- Creation of invisible 'fences'

−
- Unpredictable UAS reaction after jamming
- Interference with nearby electronic devices
- May require direct line of sight
- Relatively short range
- Legal issues related to their use

Spoofing
+
- 'Hijacking' of threat UAS
- Medium-cost solutions
- UAS usually lands in a controlled manner

−
- Not effective against homebuilt UAS and encrypted communications
- Not effective against all UAS models
- May interfere with nearby electronic devices
- Short range

Deployable nets
+
- Fixed, man-portable or UAS-mounted solutions
- Cost differentiation depending on type
- Semi-automatic solutions have good accuracy
- UAS-mounted nets can operate long range

−
- Limited operational range (ground-launched) and long reload time
- Require clear line of sight, good marksmanship (if ground-launched)
- Not effective against high-speed UAS
- Injury risk from UAS crash

Lasers, HPM, EMP
+
- 'Instantaneous' response
- Discrete countermeasures
- Big operational range
- Effective against small, fast-moving UAS
- Effective against swarms (high-power microwaves, electromagnetic pulses)

−
- Health risk due to released energy and UAS debris
- Interference with nearby electronic devices
- High-cost solutions
- Legal issues related to their use

Expendable UAS, Projectiles
+
- Effective against large, slow-moving UAS
- Proven effectiveness in the battlefield

−
- Injury risk from UAS debris/collateral damage
- Ineffective against small, fast-moving UAS
- High-cost solutions
- Legal issues related to their use

Birds of prey
+
- Blends with rural environment
- Low risk of collateral damage
- Accurate solution

−
- Lengthy and intensive training
- Special care requirements/increased cost
- Not always effective during actual incidents and against large UAS
- Potential bird injury
- Limited number of available birds

Geofencing
+
- Pre-loaded in UAS navigation software
- Effective against all drones (operated from law-abiding users)
- Creation of invisible 'fences'
- Low-cost solutions

−
- May be easily overridden
- Effectiveness relies on UAS software updates
- Incomplete formation of no-fly zones in Member States
- Not (yet) mandatory

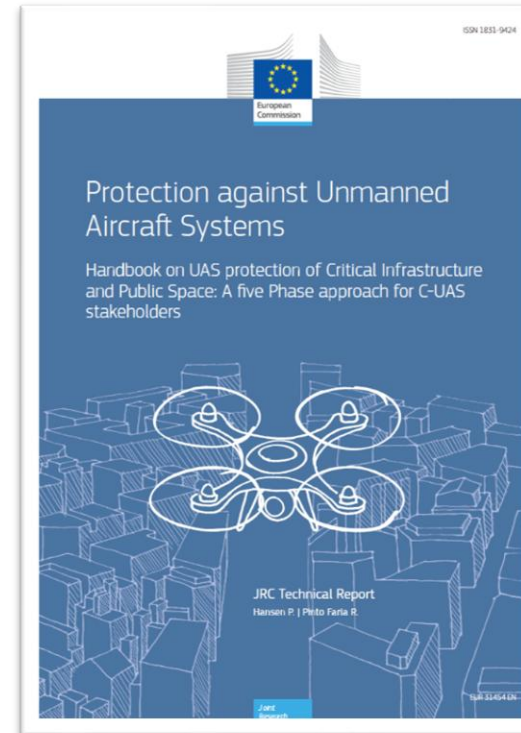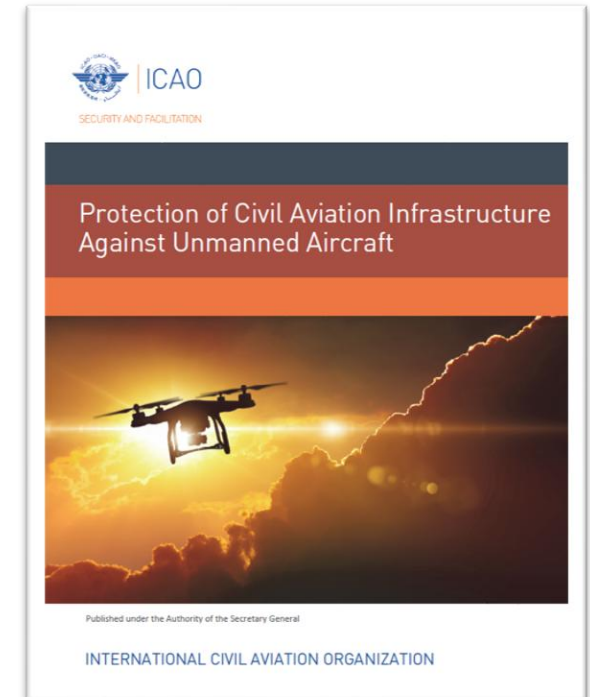# Supplementary references on counter drones

ACI counter drones knowledge centre

ACI guidance on drones in airport environment

EC guidance on protection against UAS

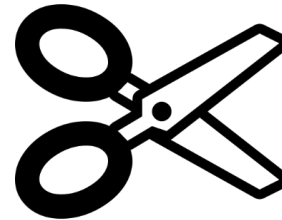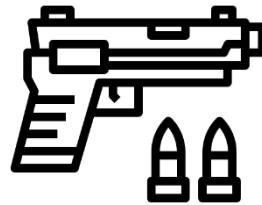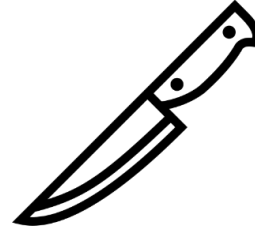ICAO guidance on protection against UAS

The Voice of
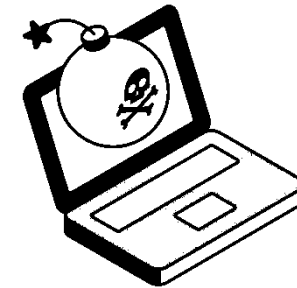**Asia-Pacific &
Middle East** Airports

24

Screeners need to look for more and more items, especially explosives

Traditional prohibited items

Explosives

The Voice of
**Asia-Pacific &
Middle East** Airports

Increasing focus on explosives by ICAO over the years

Amendment 16 (2018)

"4.4.2….shall ensure… screening methods… capable of detecting …explosives and explosive devices carried by passengers…or in cabin baggage"

Amendment 17 (2020)

"4.2.6...shall ensure…screening methods….capable of detecting explosives and explosive devices carried by persons other than passengers…."

Amendment 18 (2022)

"4.5.1bis… shall ensure…screening methods…capable of detecting….explosives and explosive device in hold baggage….."

The Voice of
Asia-Pacific &
Middle East Airports

Increasing deployment of "smart" technologies, especially at checkpoint
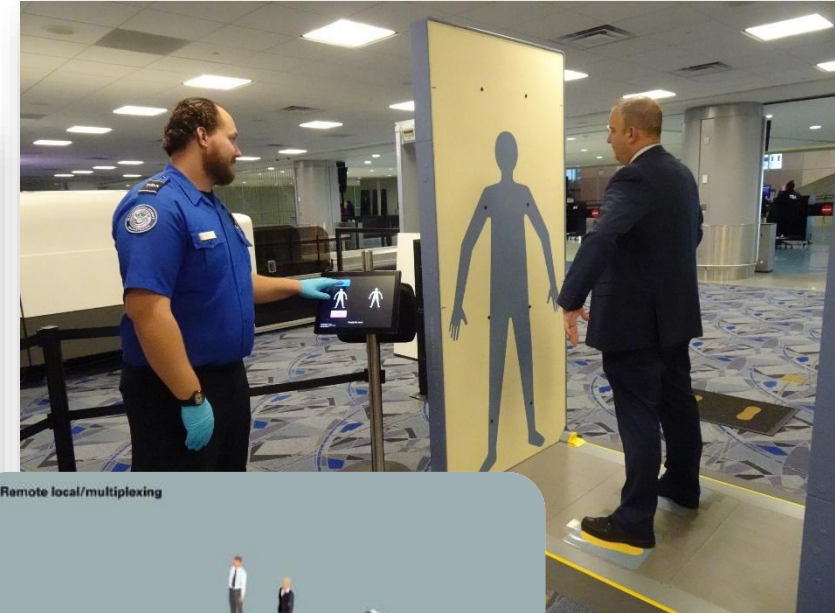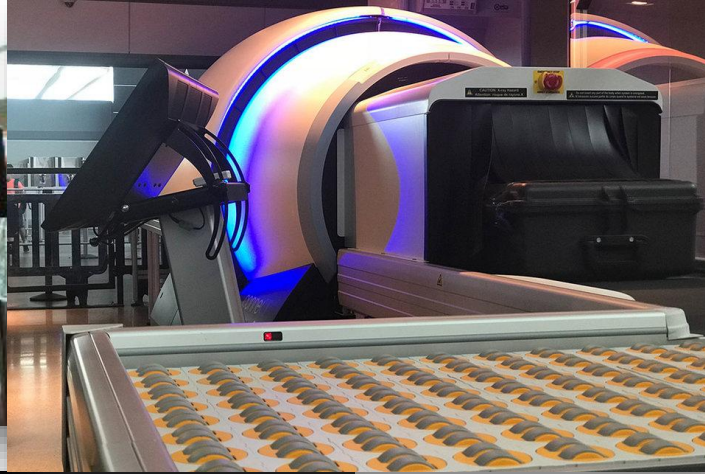
Smart security checkpoints. More to come in the region!

Hong Kong Airport

Changi Airport

Perth Airport

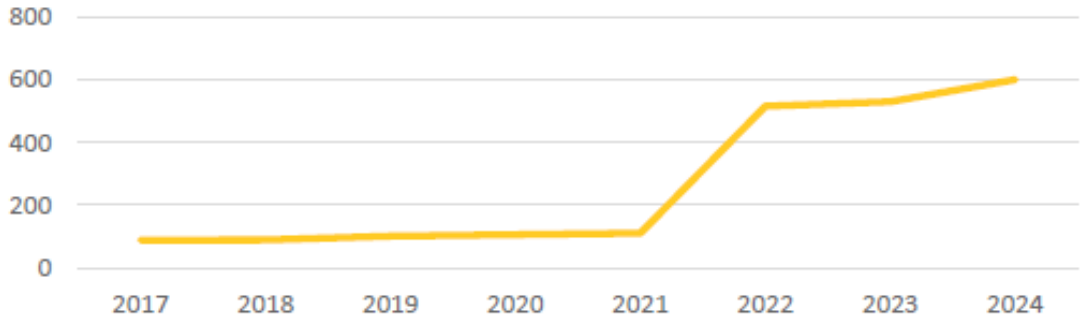Incheon Airport

Narita Airport

Bahrain Airport

The Voice of **Asia-Pacific & Middle East** Airports
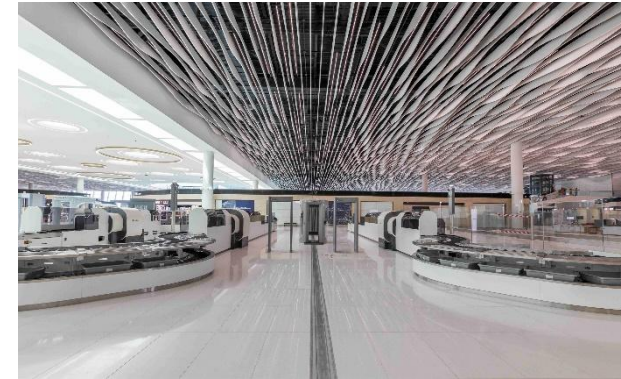
Europe also having rapid growth in CT/body scanner adoption

EDS CB Adoption in Europe
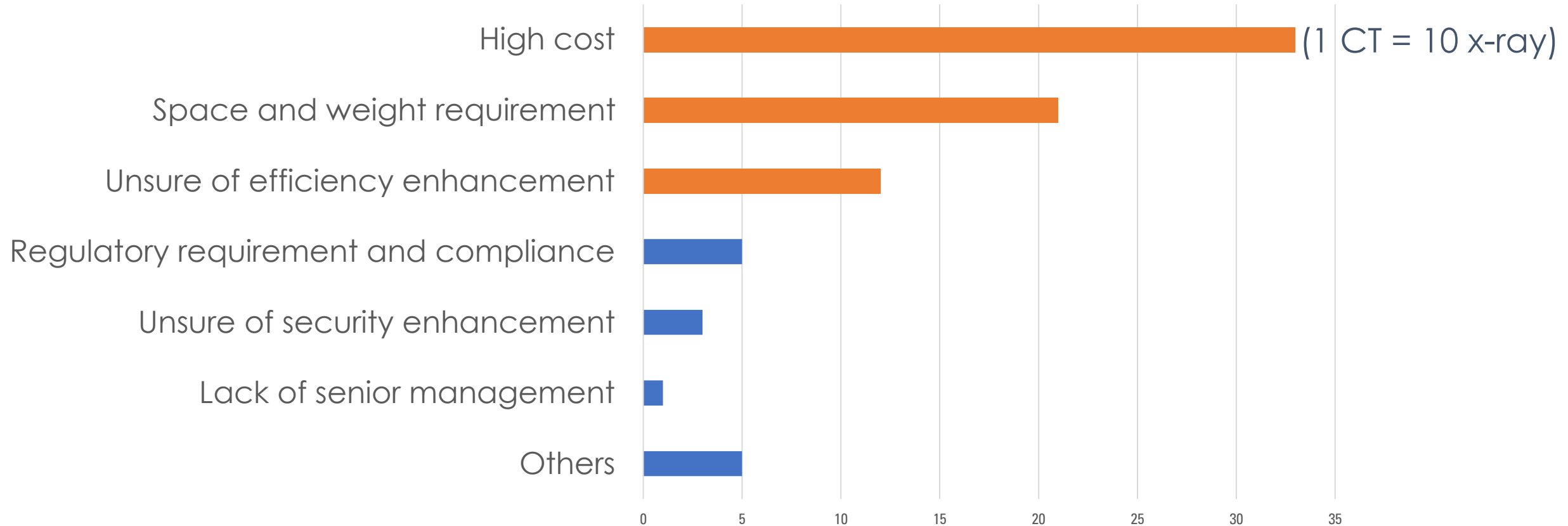(incl UK & IE units Impact – mandatory
EDS C3 implementation)

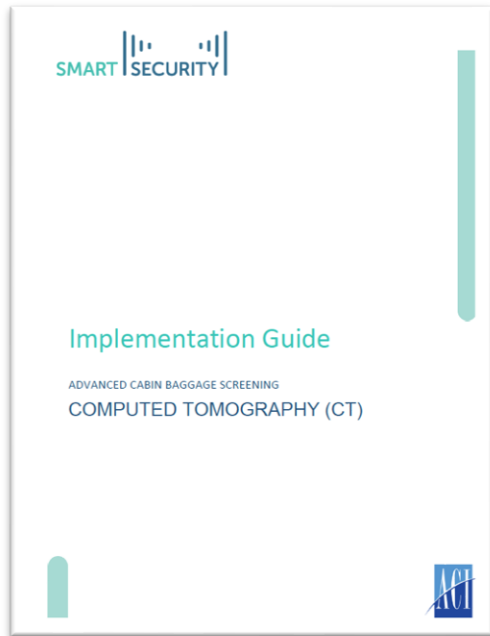Legend: UK & IE new units · Units deployed · Cumulative
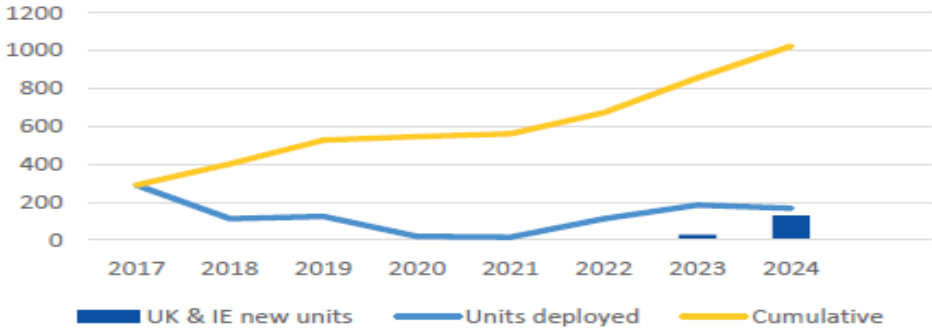
SSc Adoption (Europe)

*Based on ACI Europe's data (as of Feb 2024)

Major hurdles in advanced screening technology adoption

| Category	Value
High cost	33 (1 CT = 10 x-ray)
Space and weight requirement	21
Unsure of efficiency enhancement	12
Regulatory requirement and compliance	5
Unsure of security enhancement	3
Lack of senior management	1
Others	5

*Based on responses from 40 airport operators

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**Asia-Pacific &
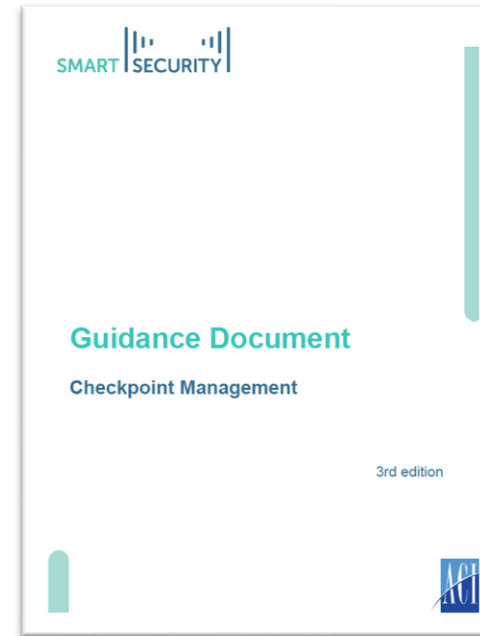Middle East** Airports
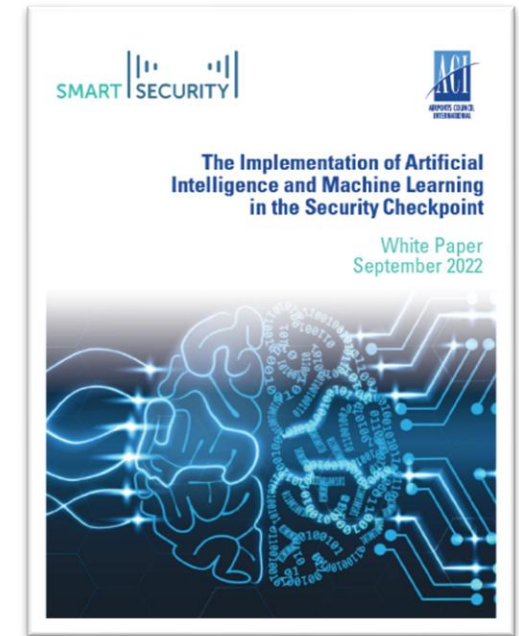
ACI is doing more to help airports on technology adoption

CT implementation guide
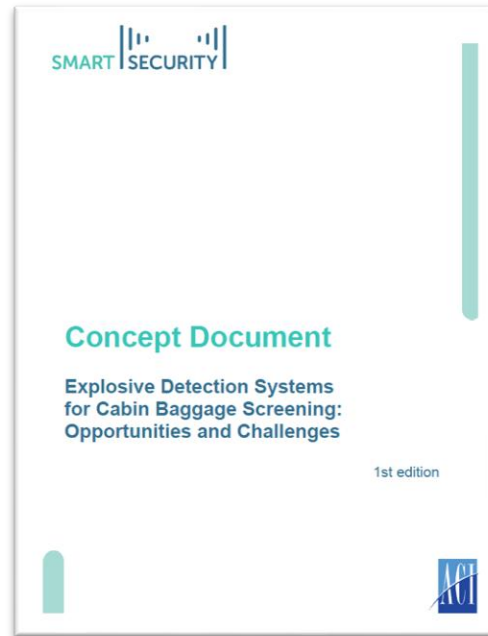
Explosive Detection System concept document

Checkpoint management guide

AI/ML in Security Checkpoint

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In summary

- Note the growing challenges for airports in addressing existing and emerging threats:
    - Landside
    - Drones
    - Explosives

- Make use of ACI's tools and resources available

- Encourage the participants to share your experience in addressing these particular threats.

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