

**60th CONFERENCE OF
DIRECTORS GENERAL OF CIVIL AVIATION
ASIA AND PACIFIC REGIONS**

*Sendai, Japan
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**AGENDA ITEM 5: [AVIATION SECURITY &
FACILITATION]**

**[ENHANCING SECURITY WITH APPROPRIATE AIRPORT
DESIGN]**

(Presented by Airports Council International and co-sponsored by Singapore and United States of America)

SUMMARY

Global passenger traffic is expected to nearly double by 2053 and significant investments in airport infrastructure will be needed to cope with the increase, especially for Asia-Pacific. A number of new airport expansion projects in the region are already under, or soon to commence, construction.

In view of this anticipated growth, the concept of security-by-design has become ever more important. This paper will highlight some common airport design-related challenges in security and reiterate how important it is for States to ensure security considerations are adequately addressed as early as in the design phase of any new airport infrastructure.

1. INTRODUCTION

1.1 Global passenger traffic is expected to nearly double by 2053, reaching 22.3 billion, reflecting a compound annual growth rate (CAGR) of 3% from 2024 to 2053. Asia-Pacific is forecasted to lead the growth with a CAGR of 3.6% for the same period.

1.2 With the expected growth in passenger traffic, significant investments in airport infrastructure are needed to cope with the traffic increase, especially for airports in the Asia-Pacific region. ACI Asia-Pacific & Middle East conducted a comprehensive survey,¹ comprising over 30 key airports from the regions to assess airport development needs. The findings indicate a strategic focus on both modernisation of the existing airports and development of new airport infrastructure, with combined investments of US\$240 billion dedicated to both upgrading existing facilities (brownfield projects) and building new airports (greenfield projects) between 2025 and 2035.

1.3 A number of new airports in Asia-Pacific are already well under construction, such as Noida International Airport in India, U-Tapao International Airport in Thailand, Western Sydney International Airport in Australia, Long Thanh International Airport in Vietnam and Changi Airport Terminal 5 in Singapore. Further, there are many more airport expansion projects in the region that are expected to start construction in the next few years.

1.4 In view of this, ACI believes that it is timely to highlight the concept of security-by-design and reiterate how important it is for airports to ensure that aviation security considerations can be taken into account as early as in the design and drawing phase of the projects and well before the start of construction. If the design is made right from the beginning, it could significantly help airports improve effectiveness and efficiency in daily operations, minimising the need for extensive infrastructural modifications afterwards. Afterthought modifications may at times be less than ideal, requiring more mitigation measures to be implemented to ensure security outcome.

2. OPERATIONAL CHALLENGES RELATED TO AIRPORT DESIGN

2.1 Security-by-design is a concept that refers to the integration of security concerns into the design and planning process of new airport infrastructure. The importance of the concept has well been recognised by ICAO through Annex 17 Standard 3.2.4, which requires Member States to ensure that airport design requirements for security measures are integrated into the design and construction of new facilities and alterations to existing facilities at airports.

2.2 However, in practice, aviation security elements are sometimes not comprehensively considered and integrated at the early stage in airport master planning. In some rare cases, security experts are not even consulted in the design and planning stage, causing security requirements to be neglected or outweighed by other considerations. This often results in substantial increased costs and delays because of the need for infrastructure changes to account for security requirements that come to light late in the construction phase or after construction is completed. This can be easily avoided by applying the security-by-design concept.

2.3 Currently, several airports in Asia-Pacific are facing difficulties to upkeep security operations due to the limitation of physical infrastructure, many of which were first designed and constructed in the 1970s and 1980s. An increasing number of airports in the region have reached or will soon be reaching capacity limits. The constraint in physical capacity and space could significantly hinder airports' ability to expand or upgrade their screening equipment and systems, in view of the significant growth of passenger volumes.

2.4 Moreover, the traditional airport layout and design may no longer keep up with the rapid industry evolution, such as the evolution of technology, threat and risk landscape, passenger

¹ [Airports in Asia-Pacific & Middle East to see US\\$240 billion investment in infrastructure expansion](#)

expectations and more. For example, the old design of terminal frontage area did not account for the growing need for landside protection or hostile vehicle mitigation. Similarly, some terminal designs do not accommodate One-stop Security due to the mixing of departing and arriving passengers, hindering the implementation of a practice that could greatly benefit transfer passengers, particularly at major hub airports.

3. SECURITY CONSIDERATIONS IN AIRPORT DESIGN

3.1 With the expected growth in airport infrastructure development, it is critical for States to work closely with the airports to ensure AVSEC elements to be adequately considered in design phase in order to minimize the operational challenges highlighted in the previous section.

3.2 The ACI Asia-Pacific & Middle East Regional Aviation Security Committee², has established a working group to develop simple guidance by compiling the key AVSEC considerations in relation to airport design. The aim is to provide airport security managers, especially those in developing countries, a reference on what should be considered when they are consulted by their design and planning teams for any upcoming infrastructure projects.

3.3 Based on the inputs gathered from airports in the region, some major design considerations for each critical airport security area are outlined in the Appendix at the end of this paper. This list is not exhaustive but highlights some key aspects to consider. Going forward, ACI will continue to help airports in the region improve security design and planning and share relevant best practices via the ICAO APAC Regional Aviation Security Coordination Forum (RASCF).

4. ACTION BY THE CONFERENCE

4.1 The Conference is invited to:

- a) Note the importance of the concept of security by design, in view of the anticipated growing investment in airports in the Asia-Pacific region; and
- b) Continue to work closely with airports and relevant stakeholders to ensure security considerations are adequately integrated into the upfront design of new airport and refurbishment of existing airport infrastructure.

² The committee is a [technical group](#) comprised of security experts from airport operators in the region.

5. APPENDIX

<u>High-level principles (applicable across all critical security areas)</u>	
<ul style="list-style-type: none"> • Risk assessment • Long-term capacity • Technology integration • Balance of security & facilitation • Regulatory compliance requirements • Flexibility & resilience • Human factors & ergonomics • Budget • Cybersecurity • Requirements by relevant stakeholders 	
Critical security area	Considerations
Passenger security checkpoint	<ul style="list-style-type: none"> • Centralized or decentralized checkpoint • Space • Technology integration (e.g. CT, body scanner, ATRS) • Requirements for passengers with special needs
Hold baggage screening system	<ul style="list-style-type: none"> • Levels of security (e.g. 5 levels or 4 levels) • Resolution procedures for suspicious bags • Availability of separate search room • Oversize baggage screening procedure • Remote screening facilities for tight connection • Offsite screening
Staff security checkpoint	<ul style="list-style-type: none"> • Space • Numbers and location of the checkpoint • Staff screening requirements • Identity verification requirements • Technology integration
Airport perimeter	<ul style="list-style-type: none"> • Double fencing requirements • Lighting • Technology integration (e.g. PIDS) • Natural surveillance • Exclusion zone • Emergency gate location • Patrol road design
Front-of-house/terminal frontage	<ul style="list-style-type: none"> • Stand-off distance • Road access for different modes of transport • Drop-off, pick up & parking location • Hostile vehicle mitigation (e.g. bollard, chicanes) • Lighting, surveillance & CCTV • Landscaping
Terminal building	<ul style="list-style-type: none"> • Blast protection • Passenger flow design & management • Access & egress (e.g. evacuation routes) • Lighting, surveillance & CCTV • Public viewing area (e.g. terrace) • Minimization of hiding spots
Cargo facility	<ul style="list-style-type: none"> • Separation of in-& out-bound cargo • Space for screening equipment

	<ul style="list-style-type: none">• Demarcation of zones (e.g. staging area for screened cargo)• Ergonomics• Areas for canine screening
Airside access point	<ul style="list-style-type: none">• Minimization of airport access points• Adequate space for staff & vehicle screening• Hostile vehicle mitigation• Lighting, surveillance & CCTV• Road design• Advanced access control system integration

— END —

Executive Summary for consideration for inclusion in the Conference Report

[ENHANCING SECURITY WITH APPROPRIATE AIRPORT DESIGN]

This DP highlighted the importance of security-by-design, which refers to the integration of security considerations in the design and drawing phase of any new or renovating airport infrastructure. This DP was well supported by the Conference as it was considered a very timely subject for the Asia-Pacific region, in view of the significant forecasted growth in capital investment in airport infrastructure development in the region in the next few decades. Member States were encouraged to work closely with airports and relevant stakeholders to ensure security considerations are integrated into the upfront design of new airport and refurbishment of existing airport infrastructure.