



ICAO

Twenty Sixth Meeting of the Communications/
Navigation and Surveillance Sub-group (CNS SG/26) of APANPIRG

WP/29

**Provision of a Digital Tower and Apron Management System
to Support Safe and Efficient Operation of
the Hong Kong International Airport and Its Expansion**

Agenda 13

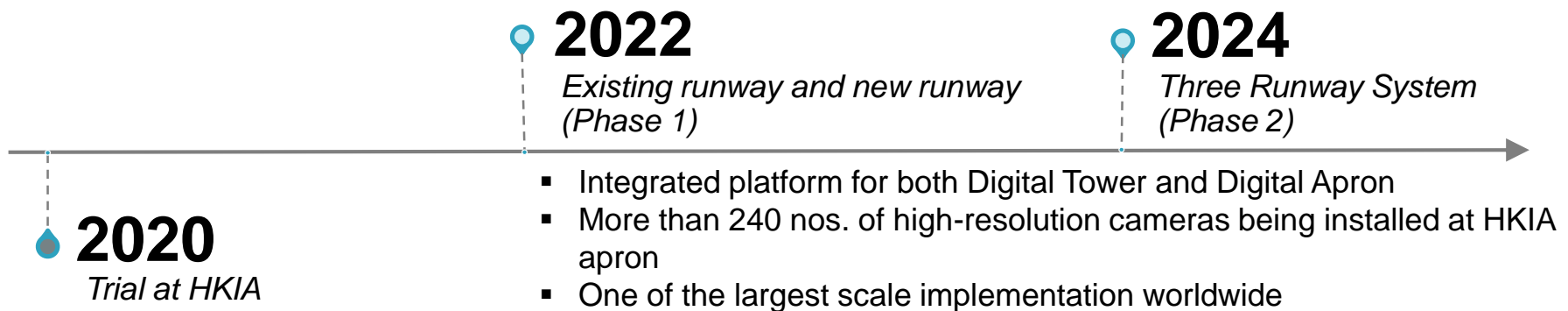
Presented by Hong Kong, China

Introduction

- ATC typically relies on various essential information such as flight information, surveillance, scheduling etc. provided by ATC systems to maintain situation awareness of on-airport aircraft/vehicle movements.
- Capitalizing on the latest digital video technologies and in line with ICAO's GANP roadmap, Remote Tower (RT), Digital Tower (DT) and Digital Apron (DA) have emerged as applications to overcome physical visual constraints by supplementing the tower's out-of-window view with ultra-high definition camera views on displays overlaid with essential aircraft information to substantially enhance ATCOs' visual surveillance

Introduction

- A prominent application is the **Digital Apron and Tower Management System (DATMS)** jointly developed by HKCAD and AAHK to support HKIA operations and its expansion into Three Runway System.
- The first phase of DATMS was commissioned in July 2022.



Discussion

- The DATMS comprises two systems:
 - Digital Tower Facilities (DTF)
 - Digital Apron Management System (DAMS)

Together, they are known as DATMS



- **More than 240 cameras** being installed at HKIA Apron
- Both DTF and DAMS leverage on cameras installed at strategic locations and “stitching” of camera outputs to generate panoramic views
- DTF provides enhanced visuals of air and ground movements and supplements out-of-eyesight views for **ATC** while DAMS generally caters for **airport operation**
- DTF and DAMS mutually share **video outputs**, **flight information** and **surveillance** data to enable users of either system to have the necessary and integrated real-time visualization of activities at the airport

Benefits

- ✓ Improved operators' experience
- ✓ Appreciation of activities on the airfield with views of interest on one screen compared to single focused view
- ✓ Enhanced efficiency and safety of ATC and airport operations
- ✓ Increased visibility under low light or low visibility conditions such as during adverse weather
- ✓ Out-of-eyesight views from strategically located cameras
- ✓ Predictive alerts of conflicting situation or intrusion into runway and airfield restricted areas

Digital Tower and Apron at HKIA



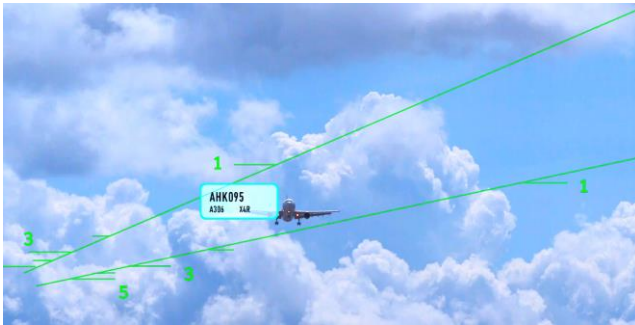
Ultra-high resolution cameras on airfield



DTF display at ATC tower



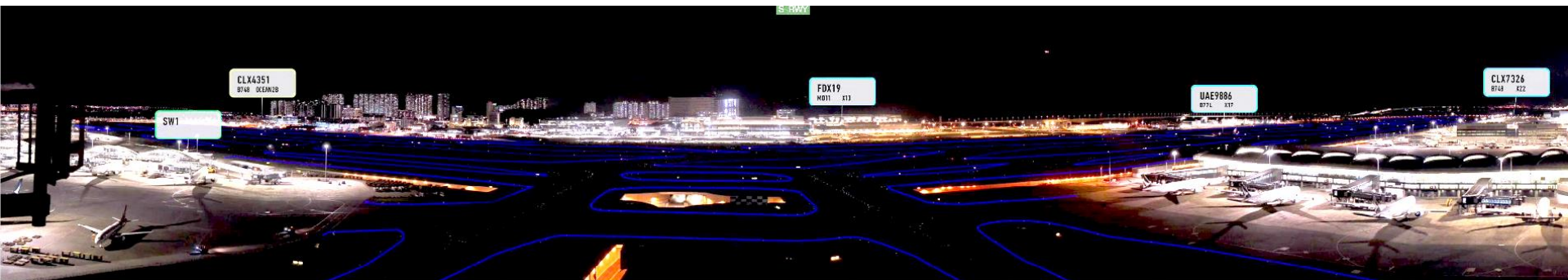
Investigation Positions



Augmented flight information on an approach flight

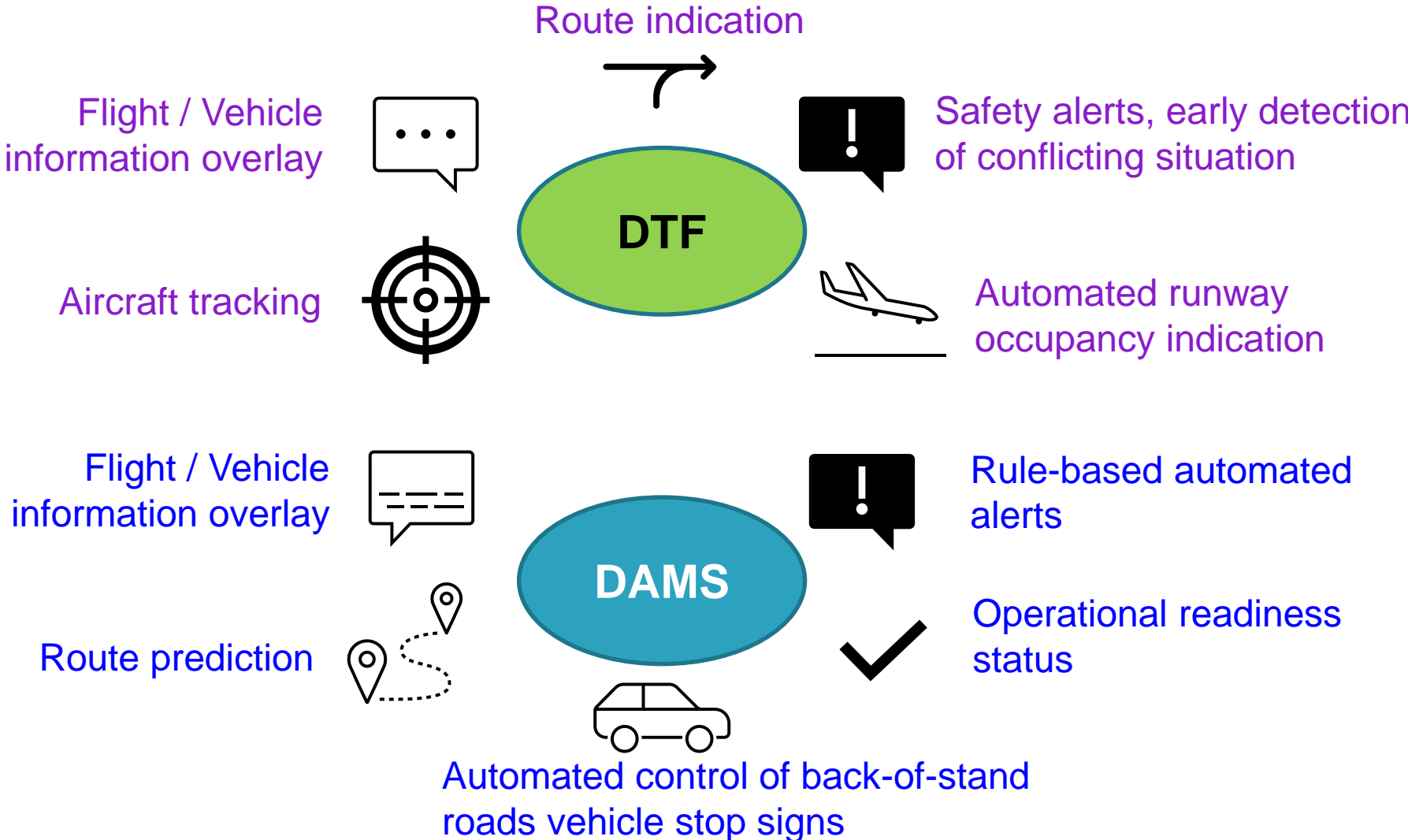


Detection and labelling of an aircraft on taxiway



Enhanced visibility during night-time and low visibility

DTF and DAMS Features



Panoramic runway views at HKIA



DTF showing an aircraft taxiing on Third Runway of the HKIA



DTF showing aircrafts taxiing / take-off / landing on South Runway of the HKIA

DTF view on Airfield under foggy / low visibility situation



DAMS view and setup



DAMS showing apron view of the HKIA



DAMS Operator Position

Conclusion

- DATMS implementation:
 - ✓ enhances information exchange between ATCOs and airport operational personnel
 - ✓ enhances real-time situation awareness
 - ✓ fosters closer collaborations between HKCAD and AAHK
 - ✓ facilitates decision-making
 - ✓ further improves safety and efficiency of overall ATC and airport operations, at busy airports like HKIA.
- A harmonized approach with common standards and guidance materials is recommended to facilitate implementation of Digital Tower and Digital Apron technologies worldwide.

Action by the Meeting

The meeting is invited to:

- a) note the efforts by Hong Kong, China in enhancing the ATC and airport operational safety and efficiency through the application of advanced Digital Tower and Digital Apron technologies;
- b) note a harmonized approach with common standards and guidance materials is recommended to ensure the harmonization and implementation of advanced Digital Tower and Digital Apron technologies worldwide; and
- c) encourage States/Administrations to continue with regional collaboration and the sharing of experiences in the use of advanced technologies for the safe, efficient and sustainable development of aviation.



Thank you



Committed to a Safe, Efficient and Sustainable Air Transport System