



### Course One

Introduction to  
Cybersecurity and  
Airport Administration

## Module Two

# Airport Planning, Design, Construction & Environmental Cybersecurity

Airport planning processes (NPIAS, Master Plans, ALP), airfield design/construction, terminal design basics, and related environmental considerations, focusing on securing data and systems in these areas.



**CSAAP**

Cybersecurity and Airport Administration Program



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**Cuyahoga  
Community  
College**



# Agenda

- Airport Planning Ecosystem (NPIAS, Master Plans, ALP)
- Airfield Design & Construction Essentials
- Airport Terminal Design Considerations
- Environmental Requirements & NEPA Process
- Cybersecurity in Physical Development Lifecycle

# Objectives

- Understand protecting property/facility management systems (5.2)
- Analyze risks in commercial/capital development projects (5.5, 6.1)
- Assess cybersecurity of capital development/AIP systems (6.3)

# Overview of Airport Planning

- **Multi-Level Process:** Federal, State, Regional, Local.
- **NPIAS (National Plan of Integrated Airport Systems):** FAA's 5-year plan identifying public-use airports and AIP-eligible development.
- **State Aviation System Plans (SASP):** More detailed guidance for state airport development.
- **Metropolitan/Regional Aviation System Plans (MASP):** Focus on needs of large metro areas (capacity, intermodal).
- **Airport Master Plans:** Airport-specific, 20-year development vision.

# The Airport Layout Plan & Master Record

- **ALP:** FAA-approved graphical depiction of current & future airport facilities.
- **Key ALP Functions:** AIP funding prerequisite, development blueprint, public record.
- **ALP Contents:** Cover sheet, layout drawing, airspace drawing, terminal area, land use, property map (Exhibit A), etc.
- **eALP:** Electronic, web-based system for sharing ALP data.

# The Airport Layout Plan & Master Record (Cont'd)

- **Airport Master Record (5010 Form):** Annual FAA form detailing operational/services data; updates charts/supplements.
- **Cybersecurity Concerns:**
  - *ALP/eALP & 5010 data are critical operational info.*
  - *Integrity & Availability are paramount.*
  - *Unauthorized modification could have safety/funding impacts.*
  - *Secure storage & access controls needed.*

# The Airport Master Plan Process

- **Purpose:** Framework for future development; cost-effective, meets airport/market/community needs, balances environmental/socioeconomic impacts.
- **Process Elements:** Pre-planning, Public Involvement, Environmental Considerations, Existing Conditions, Aviation Forecasts, Facility Requirements, Alternatives, ALP update, Implementation Plan, Financial Feasibility.
- **Consultant Selection:** Brooks Act (qualifications-based)



# The Airport Master Plan Process (Cont'd)

- **Public Involvement:** Essential. TAC & CAC committees. Open House format preferred.
- **Cybersecurity Concerns:**
  - *Master plans involve extensive data collection, forecasting models, financial plans, stakeholder inputs.*
  - *This data, if digitized and shared, needs protection against unauthorized access, modification, and ransomware.*



# Introduction to Airfield Design & Construction

- Airside vs. Landside vs. Terminal.
- Movement vs. Non-Movement Areas.
- **Airfield Components:** Runways, taxiways, aprons, NAVAIDS, ARFF stations.
- **Design Aircraft & Runway Design Code (RDC):** Critical for geometric design (AAC, ADG, Visibility).
- **Cybersecurity Concern:**
  - Design data (CAD/BIM files for runways, taxiways, terminals) is valuable intellectual property and operationally sensitive.
  - Its integrity is crucial.

# Runway, Taxiway, & Apron Design Basics

- **Runway Layouts:** Single, Parallel (Close, Intermediate, Far, Dual), Open-V, Intersecting.
- **Protection Areas:** RPZ, OFA, OFZ, RSA – ensuring clear zones.
- **Taxiway Design Group (TDG):** Based on aircraft undercarriage (MGW, CMG). Fillets, edge safety margin.
- **Apron Design:** For passenger/cargo loading, fueling, maintenance. Terminal, Remote, Hangar aprons.
- **Cybersecurity Concern:**
  - *Detailed specifications for these critical areas are often digitized.*
  - *Corruption or unauthorized access could lead to safety hazards or operational inefficiencies.*



# Airport Construction Management & Cybersecurity

- **Sponsor Responsibility:** Quality management of federally funded projects.
- **Key Meetings:** Predesign, Prebid, Preconstruction conferences.
- **Construction Safety & Phasing Plan (CSPP):** Essential for safety during construction.
- **Contractor Management:** Change orders, supplemental agreements.
- **Cybersecurity Concern:**
  - *Protecting digital CSPP, project plans, schedules, financial data in PM software.*
  - *Vendor/Contractor Cybersecurity: Ensuring third parties with access to airport networks or data have adequate security. Supply chain risk.*
  - *Securing temporary networks/devices on construction sites.*



# Airport Terminal Design & Passenger Experience

- **Fundamental Role:** Transition passengers landside <-> airside.
- **Key Components:** Passenger processing (ticketing, security, FIS), baggage handling, gate areas, concessions, admin offices.
- **Design Drivers:** Peak activity (ADPM), Level of Service (LOS), passenger flow, aircraft types.
- **Terminal Configurations:** Linear, Pier, Satellite, Remote Hard-stand, Hybrid.
- **Focus on Passenger Experience:** Wayfinding, amenities, comfort, efficiency.



# Securing Terminal Systems – BMS & PACS

- Building Management Systems (BMS) / Building Automation Systems (BAS):
  - *Control HVAC, lighting, power, elevators, fire alarms. (External Readings)*
  - *Often connected to IT networks; increasingly IoT-enabled.*
  - **Cybersecurity Risk:**
    - Unauthorized control could disrupt operations, impact safety/comfort, increase energy costs, or provide entry point to other networks.
    - Integrity and Availability are key.
    - IEC 62443 principles apply.

# Securing Terminal Systems – BMS & PACS (Cont'd)

- Physical Access Control Systems (PACS):
  - Manage badging, door/gate access to secure areas.
  - Highly sensitive database of personnel, access levels.
  - **Cybersecurity Risk:**
    - Breach could allow unauthorized physical access, compromise employee data.
    - Confidentiality, Integrity, Availability are all critical.



# Securing Terminal Systems – BMS & PACS (Cont'd)

- Multitude of other terminal IT systems:
  - *FIDS, BIDS, GIDS*
  - *BHS*
  - *Common-use systems (CUSS/CUTE)*
  - *Concessionaire POS*
  - *All have specific cyber risks.*



# Airport Environmental Requirements & Cybersecurity

- **NEPA (National Environmental Policy Act of 1969):** Requires environmental review for federal actions (e.g., AIP-funded projects, ALP approvals).
- **Process:** Categorical Exclusion (CATEX), Environmental Assessment (EA) -> FONSI, or Environmental Impact Statement (EIS) -> ROD.
- **Impact Categories:** Air quality, noise, water resources, hazardous materials, land use, etc.
- **Operational Responsibilities:** Stormwater (SWPPP), hazardous waste, spill prevention (SPCC).
- **Cybersecurity Concern:**
  - *Environmental assessments, compliance reports, monitoring data, SWPPPs, SPCC plans are often stored and transmitted digitally.*
  - *Integrity and confidentiality are key to avoid regulatory penalties or reputational damage from altered or leaked data.*



# Conclusion

- **Recap:** Airport planning (ALP, Master Plan), design, construction, and environmental management are complex administrative functions involving significant digital data and systems (GIS, CAD/BIM, PM software, BMS, compliance data).
- Cybersecurity is essential to protect the integrity, availability, and confidentiality of these assets throughout the development lifecycle.
- Considered risks to planning data, construction systems, BMS/PACS, and environmental data.

# Module 3 Preview & Questions

- Airport Operations, Safety Certification (Part 139), Airfield Maintenance, and their specific cybersecurity challenges.
- Check LMS for readings, supplemental resources, discussion board, and quiz.
- Questions?