

**Part I: Airports and Airport Systems** – Part I provides an overview of airports from a systems perspective and provides background and historical information regarding the development of airports and the rules that airport management must adhere to. Within this part are three (3) chapters.

**Chapter 1. Airports and airports systems:** An Introduction provides a comprehensive overview of airports in the United States, the national administrative structure of airports, and basic definitions that describe airports and types of airport activity.

**Chapter Objectives** - The objectives of this section are to educate the reader with information to:

- Discuss the ownership characteristics of airports in the United States and internationally.
- Describe the National Plan of Integrated Airport Systems (NPIAS) and its application to categorizing public-use airports in the United States.
- Describe the governmental administrative organizations in the United States that oversee airports.
- Identify federal regulations and advisory circulars that influence airport operations.

## **Chapter Outline**

Introduction;

- Airports in the United States – An overview;
- The national administrative structure of airports.

Airport management on an international level;

The National Plan of Integrated Airport Systems (NPIAS);

- Commercial service airports;
- General aviation airports;
- Reliever airports.

The rules that govern airport management;

Organizations that influence airport regulatory policies;

Concluding remarks.

**Chapter 2. Airports and airports systems:** Organization and administration describes the public and private ownership and administrative structures that exist for civil use airports in the United States and internationally. A comprehensive sample of employment positions that exist at airports is presented, as are descriptions of the duties of the airport manager, and an introduction to the public relations issues facing airport management.





**Chapter Objectives** - The objectives of the section are to educate the reader with information to:

- Discuss the ownership structures of airports.
- Identify the various jobs that exist at airports.
- Understand an airport organization chart.
- Discuss airport management as a potential career.
- Understand the public relations issues that are associated with airport management.

## **Chapter Outline**

Introduction;

Airport ownership and operation;

The airport organization chart;

Airport management as a career;

The airport manager and public relations;

Concluding remarks.

**Chapter 3. Airport and Airport Systems:** *A Historical and Legislative Perspective includes an account of the development of airports within the civil aviation system that has been thoroughly reviewed and updated through early 2010, including the latest legislation debate regarding airport funding, and, of course, airport security.*

**Chapter Objectives** - The objectives of the section are to educate the reader with information to:

- Discuss the various acts of legislation that have influenced the development and operation of airports since the early days of civil aviation.
- Highlight several important political events that have influenced civil aviation.
- Describe the development of national administrations that have regulated civil aviation throughout its history.
- Describe the various funding programs that have existed to support airports over the course of history.
- Discuss some of the current and future issues concerning airports and how the U.S. government might address these issues.

## **Chapter Outline**

Introduction;

The formative period of aviation and airports: 1903 – 1938:

- The birth of civil aviation: 1903 – 1913.





- World War I: 1914 -1918.
- Early airmail service: 1919 – 1925.
- The Air Commerce Act: 1926 -1938.
- The Civil Aeronautics Act: 1938 - 1939

Airport growth: World War II and the postwar period:

- The Federal Airport Act: 1946.

Airport modernization: The early jet age:

- The Airways Modernization Act of 1957.
- The Federal Aviation Act of 1958.
- The Department of Transportation: 1967.
- The Airport and Airway Development Act of 1970.
- The National Airport System Plan.
- The Airport and Airway Development Act Amendments of 1976.

Airport legislation after airline deregulation:

- The Deregulation Acts of 1976 and 1978.
- The Airport and Airway Improvement Act of 1982.
- Military Airport Program (MAP).
- The Aviation Security Improvement Act of 1990.
- The Airport and Airway Safety, Capacity, Noise Improvement, and Intermodal Transportation Act of 1992.
- The AIP Temporary Extension Act of 1994.
- The Federal Aviation Administration Act of 1994.
- The Federal Aviation Reauthorization Act of 1996.

Airports in the twenty-first century: From peacetime prosperity to terror insecurity;

- AIR-21: The Wendell H. Ford Aviation Investment and Reform Act for the Twenty-First Century.
- The Aviation and Transportation Security Act of 2001.
- Homeland Security Act of 2001.
- Vision 100 – Century of Aviation Reauthorization Act of 2003.

Concluding remarks.

**Part II: Airport operations management** – *Part II has been written to provide the airport management student, as well as the new airport management employee, with a comprehensive information source describing the facilities and operations that exist within an airport's property including the airfield,*





airspace, terminals, and ground access systems. This part may be valuable only as a text but also as a reference guide for those not in academic study. Within this part are five chapters.

**Chapter 4. The airfield:** The airfield describes the facilities that exist on an airport to facilitate the operation of aircraft, including a full description of runways, taxiways, and navigational aids, along with associated signage, lighting, and markings. Much of the information contained in this chapter is sourced directly from the Federal Aviation Administration's (FAA) Airman's Information Manual (AIM), a guide designed to provide pilots of civil aircraft with full descriptions of the aviation environment.

**Chapter Objectives** - The objectives of this section are to educate the reader with information to:

- Identify the various facilities located on an airport's airfield.
- Discuss the specifications and types of airport runways.
- Understand the importance of runway orientation.
- Identify an airport's reference code.
- Be familiar with airfield lighting, signage, and markings.
- Describe the various navigational aids that exist on airfields.
- Describe the infrastructure existing to increase the security of the airfield.

## **Chapter Outline**

The component of an airport;

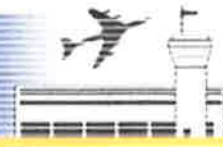
The airfield:

- Runways
  - Runway configuration
  - Runway designation
  - Runway length and width
  - Runway pavements
  - Runway markings
  - Runway safety areas, protection zones, and "imaginary" obstruction surfaces
  - A runway's imaginary surfaces
- Taxiways
  - Taxiway marking
- Other airfield markings
- Other airfield areas
- Airfield signage

Airfield lighting:

- Runway lighting
- Taxiway lighting





- Other airfield lighting

Navigational aids (NAVAIDS) located on the airfields:

- Nondirectional radio beacons (NDB)
- Very-high-frequency (VHF) Omnidirectional range radio beacons (VOR)
- Instrument landing systems (ILS)

Air traffic control and surveillance facilities located on the airfield:

- Air traffic control tower
- Airport Surveillance radar
- Airport surface detection equipment

Weather reporting facilities located on airfields:

- Wind indicators

Security infrastructure on airfields;

Concluding remarks.

**Chapter 5. Airspace and air traffic management:** *Airspace and air traffic management provides a fundamental yet detailed, description of the national airspace and air traffic control system, as it relates to airport management. A brief history of air traffic control is provided, as is a description of the management structure of the current air traffic systems. The basics of air traffic control are described, including the various classes of airspace and the rules by which they are operated. In addition, a description of the current and future planned enhancements to the air traffic control system is provided, to allow the airport manager to best prepare for the future of air traffic management.*

**Chapter Objectives** - The objectives of this section are to educate the reader with information to:

- Discuss the history of the U.S. air traffic control system.
- Identify the various classes of U.S. airspace.
- Discuss the hierarchical air traffic control management structure.
- Describe some of the technologies used to modernize air traffic control.
- Understand how air traffic control affects airport management.

## **Chapter Outline**

Introduction;

Brief history of air traffic control;

The present-day air traffic control management and operating infrastructure:





- The FAA's Air Traffic Organization (FAA ATO)
- Air Traffic Control Systems Command Center (ATCSCC)

The basics of air traffic control:

- Visual flight rules (VFR) versus instrument flight rules (IFR)
  - Airspace classes
  - Terminal radar approach control (TRACON)
  - Air route traffic control center (ARTCC)
  - Radar approach control (RAPCON)
- Air traffic control tower (ATCT)
- Victor Airways and Jet Ways
- Special-use airspace
- Flight service stations
- Terminal Area Air Traffic Control Procedures
- Traditional and Modern "NextGen" Procedures

Current and future enhancements to air traffic management

- En route Navigation
- Modernized Approach to Airports
- Airport Surface Movement Management

Concluding remarks.

**Chapter 6. Airport operations management under 14 CFR Part 139:** *Airport operations management under 14 CFR Part 139 has been moved immediately following the airfield and air traffic management chapters. This chapter discusses how the facilities described in Chapter 4 and 5 must be managed at airports certified to accommodate commercial air service under FAR Part 139 - Certification of Airports. This edition has been updated to reflect the major revisions to the FAR Part 139 in 2004.*

**Chapter Objectives** - The objectives of this section are to educate the reader with information to:

- Understand the requirements under 14 CFR Part 139 to operate airports serving commercial air carrier operations.
- Describe the different types of airfield pavements, their potential failures, and various types of maintenance programs.
- Describe the major items included in a snow and ice control plan.
- Identify the areas of concern with respect to safety inspection programs.
- Understand the aircraft rescue and firefighting requirements for a given airport.
- Discuss approaches to mitigating bird and wildlife hazards.
- Be aware of safety management systems.





## Chapter Outline

Introduction;

Part 139 airport classifications;

Inspection and compliance;

Specific areas of airport management of importance to airports found in FAR Part 139:

- Pavement management
  - Runway surface friction
- Aircraft rescue and firefighting (ARFF)
- Snow and ice control
  - Timing
  - Equipment and procedures
  - Ice accumulation
  - Aircraft deicing
- Bird and wildlife hazard management
  - Bird hazards

Self-inspection programs:

- Ramp/apron – aircraft parking areas
- Taxiways
- Runways
- Fueling facilities
- Buildings and hangars
- Components of a safety self-inspection program

SMS – safety management systems for airports;

Concluding remarks.

**Chapter 7. Airport terminals and ground access:** *Airport terminals and ground access describes the infrastructure used to facilitate the transfer of passengers and cargo between aircraft and their ultimate origins and destination within a metropolitan area. The chapter includes a historical account of the development of airport terminals, a description of the various airport terminal geometries that have been constructed, the components of the airport terminal, including aircraft aprons and gates, passenger processing facilities, and vehicle access facilities, such as roadways, curbside, parking lots, and public transit systems.*





**Chapter Objectives** - The objectives of this section are to educate the reader with information to:

- Understand the development of airport terminals from the early days of commercial aviation to present-day terminal design concepts.
- Identify the facilities within an airport terminal that facilitate the transfer of passengers and baggage to and from aircraft.
- Describe the essential and ancillary processing facilities, including terminal concessions, located within airport terminals.
- Be familiar with the various modes of transportation that comprise airport ground access systems.
- Describe various technologies that are being implemented to improve ground access to airports.

## **Chapter Outline**

Introduction;

The historical development of airport terminals:

- Unit terminal concepts
- Linear terminal concepts
- Pier finger terminals
- Pier satellite and remote satellite terminals
- The mobile lounge or transporter concept
- Hybrid terminal geometries
- The airside-landside concept
- Off-airport terminals
- Present-day airport terminals

Components of the airport terminal:

- The apron and gate system
- Aircraft gate management
  - Gantt charts
- The passenger handling system
  - Passengers and their required processing facilities
  - Passenger check-in
  - Security screening
  - At-gate processing
  - Customs and border patrol facilities
  - Ancillary passenger terminal facilities
  - Vertical passenger terminal facilities
  - Baggage handling







- Baggage claim

Airport ground access:

- Access from the CBD and suburban areas to the airport boundary
- Access modes
- Factors influencing demand for ground access
- Coordination and planning of ground access infrastructure
- Access from the airport boundary to parking area and passenger unloading curbs at the terminal building
- Vehicle parking facilities
  - Off-airport parking
  - Employee parking
  - Car rental parking
  - Terminal curbs
- Technologies to improve ground access to airports

Concluding remarks.

**Chapter 8. Airport security:** *Airport security has been updated to describe the historical, current, and possible future of the operation of an airport from security perspectives. Historical accounts of airport security-related events are described, as is a comprehensive analysis of the events of September 11, 2001. The Transportation Security Administration (TSA) and the associated regulations that affect airport operations are discussed. In addition, current and future technologies that may be used to enhance airport security are described.*

**Chapter Objectives** - The objectives of this section are to educate the reader with information to:

- Be familiar with the history of airport security threats and associated legislative action.
- Describe the organizational structure of the Transportation Security Administration (TSA).
- Define the various security sensitive areas around the airport.
- Describe the facilities located at airports that are part of the post-September 11, 2001, security environment.
- Understand the differences in security procedures between commercial service and general aviation airports.
- Be familiar with the various technologies that are being developed to enhance airport security.

## **Chapter Outline**

Introduction;

History of airport security;

The Transportation Security Administration (TSA);





Security at commercial aviation airports:

- Passenger screening
- Checked-baggage screening
- Employee identification
- Controlled access
- Biometrics
- Perimeter security

Security at general aviation airports:

- The twelve-five and private charter program

The future of airport security;

Concluding remarks.

**Part III: Airport administrative management** – *Part III has been designed to provide the airport management student with fundamental concepts and regulations that govern airport planning and management. This part focuses on the financial, administrative, and planning aspects of airport management. This part contains five (5) chapters.*

**Chapter 9. Airport financial management:** *Airport financial management presents the various strategies that exist to account and pay for the land, labor, and capital required to maintain financially stable airport operations and development. Airport accounting strategies are described, as are issues concerning airport insurance, revenue generating strategies, airport budgeting, and airport funding and financial strategies.*

**Chapter Objectives** - The objectives of this section are to educate the reader with information to:

- Understand the difference between operation and maintenance (O&M) and capital improvement expenses.
- Be familiar with the process of airport financial accounting.
- Explain the need for liability insurance at airports
- Describe the various operating and non-operating revenues at airports.
- Be familiar with planning and operating budgets.
- Recognize the difference between the various forms of airport-airline financial agreements.
- Describe the concept of a majority-in-interest clause.
- Describe the different type of funding programs available to airports.





## Chapter Outline

Introduction;

Airport financial accounting:

- Operating revenues

Liability insurance:

- Airport liability coverage
- Operating revenues

Planning and administering an operating budget;

Revenue strategies at commercial airports:

- The residual cost approach
- The compensatory cost approach
- Comparing residual and compensatory approaches
- Net income
- Majority-in-interest (MII) clauses
- Term of use agreements

Pricing of airport facilities and services:

- Pricing on the airfield area
- Terminal area concessions
- Landside and ground transportation facilities
- Airline leased areas
- Other leased areas

Variation in the sources of operating revenues

Rise in airport financial burdens;

Airport funding;

Grant programs:

- Airport Improvement Program (AIP)
- Passenger facility charges (PFCs)
- Other federal funding sources
- Facilities and equipment program
- Federal letters of intent
- State grant programs





- Grand assurances

#### Airport financing:

- General obligation bonds
- General airport revenue bonds
- Special facilities bonds
- Financial and operational factors
- Airline rates and charges
- Community economic base
- Current financial status and debt level
- Airport management
- Bond ratings
- Interest costs
- Defaults

#### Private investment:

- Build, operate, and transfer (BOT) contracts
- Lease, build, and operate (LBO) agreements
- Full privatization

#### Concluding remarks.

**Chapter 10. The economic, political, and social role of airports:** *The economic, political, and social role of airports describes the impacts that airports have on their surrounding communities, including the economic benefits of additional transportation service and associated economic activity and the environment impacts such as noise, air and water quality, and industrialization. In addition, the political role of airport management when dealing with tenants of the airport and the outside community is described.*

**Chapter Objectives** - The objectives of this section are to educate the reader with information to:

- Understand the important economic role airports play within local communities.
- Describe how airport activity stimulates economic growth in a metropolitan region.
- Appreciate the complex relationship between airport management and the airlines that serve their airports.
- Understand the relationship airport management hold with concessionaires that serve the airport.
- Be familiar with the relationship between airport management and the general aviation community.
- Define the various measures used to determine the impact of noise around the airport.





- Describe various noise abatement programs employed at airports.
- Describe methods used to make airports economically, environmentally, and socially sustainable.

## **Chapter Outline**

Introduction;

The economic role of airports:

- Transportation role
- Stimulating economic growth

Political roles:

- Airport – airline relations
- Airport – concessionaire relation
- Airport – general aviation relations

Environmental impacts of airports:

- Airport noise impacts
- Measurement of noise
- Air quality
- Water quality
- Hazardous waste emissions
- Externalities
- Economic and environmental sustainability practices

Social responsibilities;

Concluding remarks.

**Chapter 11. Airport Planning:** *Airport Planning describes the strategies employed on local, regional, and national levels to prepare airports for future aviation activity. The chapter describes system planning in national and regional levels, and focuses on airport master planning, including demand forecasting, airport layout plans, runway orientation, land use planning, obstruction clearances, terminal area plans, and economic evaluation of planning alternatives. This chapter is designed to prepare the university level student for more advanced study in airport planning and design.*

**Chapter Objectives** - The objectives of this section are to educate the reader with information to:

- Define the various types of airport planning studies.
- Understand the concepts of national-, regional-, and state-level system planning.
- Describe the different elements of the airport master plan.





- Be familiar with an airport layout plan.
- Describe the factors that are considered in terminal area planning.
- Identify the considerations involved in financial of an airport.
- Describe the various processes involved with airport environmental planning.

## Chapter Outline

### Introduction:

- Defining the planning horizon.

### Airport system planning:

- National-level system planning
- Regional-level system planning
- State-level systems planning

### The airport master plan:

- Objectives of the airport master plan
- Elements of the master plan
- Inventory
- Historical review of airports and facilities
  - Airspace structure and NAVAIDs
  - Airport-related land use
  - Aeronautical activity
  - Socioeconomic factors

### The airport layout plan;

### Forecasting:

- Qualitative forecasting methods
- Quantitative methods
- Regression analysis
- Forecasts of aviation demand
  - Civil airport users
  - Operational activity

### Facilities requirements:

- Aircraft operational requirements
- Capacity analysis

### Design alternatives:





- Site selection
- Runway orientation and wind analysis
  - Identifying the Airport Reference Code on the basis of critical aircraft
  - Analyzing historical wind data for the airfield
- Airspace analysis
- Surrounding obstructions
- Availability of expansion
- Availability of utilities
- Meteorological conditions
- Economy of construction
- Convenience to population
  - Noise
- Cost comparison of alternate sites
- Terminal area plans
  - Terminal area factors
  - Steps involved in determining space requirements
- Airport access plans

#### Financial plans:

- Economic evaluation
- Break-even need
- Potential airport revenue
- Final economic evaluation

#### Land use planning:

- Land uses on the airport
- Land uses around the airport

#### Environmental planning;

#### Concluding remarks.

**Chapter 12. Airport capacity and delay:** *Airport capacity and delay has been enhanced from previous editions by adding update information regarding the latest developments in regulations and technologies that affect airport capacity and delay. In addition, this chapter introduces fundamental concepts that govern the laws of airport capacity and delay.*

**Chapter Objectives** - The objectives of this section are to educate the reader with information to:

- Define the concepts of capacity, particularly as it relates to airport activity.
- Identify the factors of the airport environment that affect capacity and delay.





- Be familiar with the various runway configurations and their rules of operation that affect capacity.
- Describe the concept of LAHSO, as it relates to airport capacity.
- Estimate the capacity of an airfield on the basis of FAA approximation charts.
- Be familiar with the time-space diagram analytical tool used to estimate runway capacity.
- Describe various simulation models used to estimate airport capacity.
- Define the concepts of delay as it relates to airport activity.
- Be familiar with the queuing diagram as an analytical method of estimating delay.
- Discuss various strategies to reduce delay at airports.

## **Chapter Outline**

Introduction;

Defining capacity;

Factors affecting capacity and delay;

Estimating capacity;

Illustrating capacity with time-space diagram

FAA approximation charts;

Simulation models:

- FAA's airport capacity benchmarks

Defining delay;

Estimating delay;

Analytical estimates of delay: The queuing diagram;

Other measures of delay;

Approaches to reduce delay:

- Creating new airport infrastructure
- Converting military airfields

Administrative and demand management:

- Administrative management
- Demand management

Concluding remarks.







**Chapter 13. The future of airport management:** *The future of airport management concludes the text by presenting issues that may potentially have significant impacts on the future of airport planning and management. Included in this chapter are descriptions of new aircraft technologies, ranging from super-jumbo aircraft to small aircraft transportation systems. The text concludes with a brief discussion regarding the needs of future airport managers to further educate themselves in the many facets of management, particularly from a business perspective, as airports further develop as efficient business focused operating systems.*

**Chapter Objectives** - The objectives of this section are to educate the reader with information to:

- Discuss how the events of the early twenty-first century will continue to affect airport management in the future.
- Understand the near-term issues of safety and environmental sustainability with respect to the near-term future of airport management.
- Describe how the implementation of NextGen and new FAA Authorization will affect airport management in the future.
- Discuss the future impacts of increased globalization and potential land-use planning paradigms on airports.

## **Chapter Outline**

Introduction;

Reviewing previous predictions:

- Restructuring of commercial air carriers
- New large aircraft, specifically the Airbus A-380
- Small aircraft transportation systems (SATS)

The future outlook for airport management:

- Enhanced safety
- Environmental sustainability
- FAA reauthorization
- Future financial and marketing strategies
- NextGen implementation
- Globalization
- The airport cities

Concluding remarks.

