Rethinking the Fundamentals of Aviation System Planning
New Considerations for System Planning

Discussion Outline

• Airport System Plan Definitions and Process
• Recently Completed Studies
• Airport System Planning
  – Challenges
  – Current and Future Trends in Aviation
• New Considerations for System Planning
Airport System Plan Definitions

• United States Code, Federal Law 49 Section 47102:
  – “Integrated airport system planning means developing for planning purposes, information, and guidance to decide the extent, kind, location, and timing of airport development needed in a specific area to establish a viable, balanced, and integrated system of public-use airports”

• Federal Aviation Administration (FAA), Advisory Circular (AC) 150/5070-7, The Airport System Planning Process, 2004:
  – “The main purpose of the airport system planning process is to determine the type, extent, location, timing, and cost of the airport development needed in a state or metropolitan area to establish a viable system of airports. The aviation planning agency and the FAA should use the findings of the planning process to guide them in making informed decisions regarding which local airport development proposals to consider for future review and support.”
Airport System Plan Process

Per FAA AC 150/5070-7:

- Exploration of Aviation Issues in Study Area
- Inventory of Current System
- Identification of Air Transportation needs
- Forecast of System Demand
- Consideration of Alternative Airport Systems
- Definition of Airport Roles and Policy Strategies
- Recommendation of System Changes, Funding Strategies and Airport Development
- Preparation and Implementation Plan

Source: Federal Aviation Administration, Advisory Circular 150/5070-7, The Airport System Planning Process, 2004
Recently Completed Studies


Airport System Planning – Challenges

• Some Capacity Concerns with the Existing Network of Airports
  – Legacy Infrastructure
  – Shortage of Facilities in Large Metropolitan Areas
  – Unbalanced Airport Capacity
  
  • *GAO-10-120: “Nearly one-in four arriving flights delayed at major airports, even though a majority of the nation’s airports still have adequate capacity”*

**Actual Operations vs. Capacity at Select Airports in the New York/New Jersey Region**

Source: Federal Aviation Administration, ASPM Database, Calendar Year 2011
Airport System Planning – Challenges

• Even if Planned Improvements are Completed, the FAA has Identified 14 Airports that May Be Become Significantly Congested by 2025
• Capacity Constraints and Delays at Congested Airports is Likely to Simulate Traffic Growth at Other Airports in the Region

Airports Needing Capacity in 2015 and 2025, If Planned Improvements Occur

Airports projected to need capacity in 2015 and 2025, even if planned improvements occur
Airports projected to need capacity in 2025, even if planned improvements occur

Source: Government Accountability Office (GAO), National Airspace System, Regional Airport Planning Could Help Address Congestion if Plans were Integrated with FAA and Airport Decision Making, December 2009 based on FAA Future Airport Capacity Task 2 (FACT 2).
Airport System Planning – Challenges

- Lack of Integrated Infrastructure Strategies
  - Individual Airport Master Plans Do Not “Fit” Together
  - Competing Governing Entities
  - Lack of Integration with Other Transportation Modes
  - Absence of Integration with Other Local, Regional, Federal Plans

Source: Ricondo & Associates, January 2013
Airport System Planning – Challenges

• Disconnect between FAA Funding and Regional Aviation System Plan (RASP)
  – Advisory Nature of RASP
  – RASP have Limited Influence on FAA Project Prioritization and Funding
  – Airport Sponsors Retain Authority over Planning and Development Decisions

Source: Ricondo & Associates, January 2013

Federal, State, and Local Responsibilities

- Federal/National ACIP
- Regional ACIP
- Local and Statewide CIP
- Airport Master Plan
- AIP Funding Allocation
- Airport Development Projects

ACIP: Airport Capital Improvement Program
AIP: Airport Improvement Program
CIP: Capital Improvement Program
RASP: Regional Aviation System Plan
Current and Future Trends in Aviation

- Airline/Traffic Consolidation
  - The Domestic Market has Become a Harsh Environment for U.S. Network Carriers
  - Domestic Capacity Offered by U.S. Network Carriers has Dropped by 8.2%
  - International Capacity Offered by U.S. Network Carriers has Increased by 4.3%

Current and Future Trends in Aviation

• Airline/Traffic Consolidation
  – Alliances and Mergers are Now a Preservation Tool For Network Carriers
    • *Enhance Demand for the Network as a Whole - Consumers Place Value on Having Access to Large Networks*
    • *Economies of Density Can be Achieved by Merging Networks*
    • *Alliances Provide a means to Exploit Each Other’s Networks and To Strengthen the Competitive Positions of all Alliance Partners*
    • *Alliances between Airlines on International Markets Provide Virtual Hub Connections to Untapped Markets*
    • *Alliance-Assisted Market Development can Lead to New Nonstop Service*
Current and Future Trends in Aviation

• The Integration of Rail Service At Major Hub Airports is Gaining More Consideration

Current and Future Trends in Aviation

- High-speed Rail Could Impact Passenger Demand and the Service Areas of Airports:
  - Air Travel Substitution on Short-Haul (e.g. MIA- MCO)
  - Expanded Airport Service Area (Airport Feeder)

Current and Future Trends in Aviation

• Improved Air Traffic Management will Benefit Airports
  – Next Generation Air Transportation System (NextGen)
    • Replace Conventional Navigation Systems with Area Navigation (RNAV) and Required Navigation Performance (RNP) Precision-Based Navigation Technologies and Procedures
    • Optimize Use of the Airspace
    • Reduce Separation Distances between Aircraft
    • Increase Airspace and Airport Capacity
• The Implementation of NextGen:
  – Will Increase the Capacity of Airfields, in Poor Weather Conditions
  – Will Reduce Airspace Conflicts between Airports (e.g. LGA and JFK)
  – Could Impact Triggers for the Reallocation of Traffic Demand within Airport Systems

Current and Future Trends in Aviation

• Revenue Diversification
  - Airports Have Evolved into Steadily Expanding Centers of Business that Perform a Host of Functions:
    • Shopping Malls
    • Manufacturing Complexes
    • Golf Courses
    • Amusement Parks
    • Hotels, and etc.
Current and Future Trends in Aviation

- New and Improved Aircraft Types
  - Narrowbody Aircraft Have Much Longer Range than Older Models
  - Passenger Terminal Gate Frontage Productivity is Anticipated to Decline with New Widebody Aircraft (e.g. Boeing 787-8, Airbus A380)

Narrowbody Aircraft Ranges Comparison

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<th>Narrowbody Aircraft</th>
<th>Range (in Nautical Miles)</th>
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Source: Airbus and Boeing Websites, accessed January 2013.
New Considerations for System Planning

• Embrace the Concept of Capacity Sharing
  – Identify Airports Primary Focus Areas
    • Examples:
      – LaGuardia Airport: Domestic Short and Medium Haul Flights
      – Newark Liberty International Airport: International and Domestic Medium Haul Flights
      – John F. Kennedy International Airport: International Gateway
      – Teterboro Airport: Corporate and General Aviation

  – Differentiate Airport Classifications and Functions
    • Example: Kendall-Tamiami and Homestead General Aviation Airports
      – Both General Aviation Airports
      – Very Different Functions
New Considerations for System Planning

• Integrate Local, State, and Regional Transportation Plans
  – Light and High-Speed Rail
  – Local and Regional Roadway Networks

Example of Airport System Scenarios: San Francisco Bay Area’s Airport System Traffic Projections

Base Case, Scenario A (Traffic Redistribution + High Speed Rail), and Scenario B (Traffic Redistribution + Expanded Service at Sonoma County Airport + High Speed Rail)

Notes:
1/ The Regional Airport Study being conducted for the San Francisco Bay area is collaborative effort involving the Metropolitan Transportation Commission (MTC), the Association of Bay Area Governments (ABAG), the Bay Conservation and Development Commission (BCDC), the Regional Airport Planning Committee (RAPC), the Bay Area Air Quality Management District (AQMD), the Federal Aviation Administration (FAA), San Francisco International Airport, Metropolitan Oakland International Airport, Norman Y. Mineta San Jose International Airport, and the California Department of Transportation, Division of Aeronautics (Caltrans).

2/ The California High-Speed Rail project is a planned high-speed rail system in the state of California that would serve major cities including Sacramento, San Francisco, San Jose, Fresno, Bakersfield, Palmdale, Los Angeles, Anaheim, Riverside, Irvine, and San Diego.

New Considerations for System Planning

• Integrate Local, State, and Regional Transportation Plans
  – Airport Express Train\(^1/\)

Note: 1/ Airport Express is a service providing passenger rail transport from an airport to a nearby city by high-speed dedicated airport railway.

Photo Credits: Heathrow Express, www.heathrowexpress.com; Airport Rail Link, http://airportraillink.railway.co.th/th/index.html; Arlanda Express, Björn Fredriksson; Beijing Airport City, Snowy Owls
New Considerations for System Planning

• Develop a Regional Commercial Strategy that Recognizes the Strengths and Weaknesses of Airports within the System
  – Passenger Terminal Retail Development
  – Cargo Facilities
  – FBO and MRO Facilities
  – Landside Commercial Developments
    • Hotels
    • Offices
  – Logistic and Distribution Centers
  – Business Parks

• Identify which Airports/Assets are Best Suited to Accommodate Aviation and Non-Aviation Demand
New Considerations for System Planning

• Recognize the Elasticity of Passenger Demand and the Need for Flexible Facilities
  – Air Travel Price Sensitivity (e.g. “Southwest Effect”)
  – Effect of Ground and/or Airside Transportation Congestion
  – Airline Mergers
New Considerations for System Planning

• Assess Regional Demand

• Develop Future Scenarios that Allocate the Forecast Regional Demand to Each Airport In the System

– Example: Miami Dade Aviation Department – General Aviation Airports

New Considerations for System Planning

New Considerations for System Planning

Key Considerations:

- Airport Capacity and Delay
- Strengths and Weaknesses of Individual Airports Within the System
- Role of Airports within the System
- Airspace Conflicts

Capacity Needs

- Impacts of Other Transportation Alternatives
- Allocation of Regional Demand to Each Airport in the System
- Elasticity of Passenger Demand

Regional Commercial Strategy

- Primary Focus Areas of Airports
- Classifications and Functions of Airports

Source: Federal Aviation Administration, Advisory Circular 150/5070-7, The Airport System Planning Process, 2004
New Considerations for System Planning

• An Integrated and Collaborative Process Among Many Parties

1. Identify Airport Primary Focus Area
2. Prepare Master Plan based on Individual Airports and System Goals and Objectives and the DOT Market Projections
3. Submit Airport Project & Funding Request
4. Implement Projects
5. Define the Requirements of the Various Stakeholders
6. Set goals and objectives that will allow for the development of an airport system plan which provide adequate capacity* and result in a regional sustainable air transport system.
7. Score Proposed Airport Projects based on Statewide Evaluation Criteria and Demand
8. Define Market Demand Scenarios (Airports, Roadways, Rails)
9. Define Regional Transportation Plans
10. Approve/Reject Projects based on National Priority and Regional Transportation Plan
11. Prepare Regional ACIP
12. Distribute AIP Grant
13. Provide State Funding of AIP Approved Capital Projects

Note: *Adequate capacity implies a distribution of capacity that reflects the market demand and the needs and priorities of the widest range of stakeholders.