FAA Airports Capacity Updates

Presentation to:
2011 ACI-NA/ACC/FAA Airport NEPA & Planning Workshop

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Date: December 6, 2011
Agenda

- Airport Capacity Benchmarks
- Future Airport Capacity Task (FACT3)
- Capacity Guidance Status
2011 Airport Capacity Benchmarks

- **Purpose:** provide a high-level assessment of airport runway capacity now and in the future (2020)
- **Benchmark Definition:** hourly throughput that an airport’s runways are able to sustain during periods of high demand
- **Update to previous benchmark reports published in 2001 and 2004**
- **What:**
  - ATC Facility Rates (i.e., call rates) and model-estimated capacity rates
  - Highest capacity configuration during Visual, Marginal, and Instrument weather conditions
  - 30 Core Airports
  - LGB, OAK, SNA are also included, because they were identified as capacity-constrained in FACT2
- **Intended Use**
  - Reference point on the throughput rate of selected US airports at a specific time
  - Internally, FAA uses the benchmarks as an input to FACT3 and NextGen Systems Analysis
- **When:** soon!
Agenda

• Airport Capacity Benchmarks
• Future Airport Capacity Task (FACT3)
• Capacity Guidance Status
FACT2 Analysis
Published in May 2007

• Objectives
  • Determine which airports and metropolitan areas have the greatest need for additional capacity
  • Provide insights about the timing and need for infrastructure improvements at the national level for agency planning purposes

• Scenarios
  • 2007, 2015, 2025

• Planned Improvements
  • New runways, OEP, “NextGen” improvements
FACT2 Identification of Congested Airports

2015

<table>
<thead>
<tr>
<th>After Planned Improvements</th>
<th>If Planned Improvements Do Not Occur</th>
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<tbody>
<tr>
<td>6 airports that need additional capacity</td>
<td>18 airports that need additional capacity</td>
</tr>
<tr>
<td>4 metro areas that need additional capacity</td>
<td>7 metro areas that need additional capacity</td>
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</table>

2025

<table>
<thead>
<tr>
<th>After Planned Improvements</th>
<th>If Planned Improvements Do Not Occur</th>
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<tbody>
<tr>
<td>14 airports that need additional capacity</td>
<td>27 airports that need additional capacity</td>
</tr>
<tr>
<td>8 metro areas that need additional capacity</td>
<td>15 metro areas that need additional capacity</td>
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</table>
FACT2 Needs to be Updated

• Since FACT2 was published:
  – Base activity levels and forecasts have changed due to economic conditions and airline restructuring
  – New runways have opened / OEP completed
  – NextGen plans and performance capabilities have matured

• Which airports and metro areas are likely to be constrained in the future, based on what we know today?
FACT3: Expand the Core Analysis

- Updates: forecasts (demand, fleet mix) and current NextGen plans
- Expand NAS-Wide analysis to include taxiways and up to gates (broad/general effects)
FACT3 Planned Analyses

- Demand Days/Fleet Evolution
- Identify Airports of Interest
- Calculate Hourly airport capacities
- Annual Service Volumes (ASVs)
- NAS-Wide Analysis
- Metro Area Analysis
- Identify Capacity-constrained airports
- Additional Scenarios
- Identify Range of Future Demand and Capacity Levels

- Potential to amend scenarios and metro area analyses if required due to resource constraints
Airports of Interest in FACT3

- Core 30 airports
  - 29 Large Hubs and Memphis
- FACT 2 Congested airports, not in Core
  - LGB, OAK, SNA
- Broad survey of the airport system:
  - Significant general aviation airports in key metro areas
    - 500+ airports considered, identified 11 (e.g., TEB, FRG, IWA, VNY) for further analysis
  - Other commercial airports with possible capacity shortfalls
    - 301 airports considered; compared 2030 demand to current capacity
  - Result: Identified 16 additional airports for further analysis
FACT3 Scenarios for Analysis

Demand:

Baseline:
- Reference Case
- Reference Case (with Segment A)
- Reference Case (with Segment A)

Plus Infrastructure:
- Plus new runways by 2020
- Plus new runways by 2030

Plus NextGen:
- Plus Segment Bravo
- Plus Segment Bravo

Plus Advanced NextGen:
- Plus NGOps 3+
## FACT3 Milestones

<table>
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<tr>
<th>Description</th>
<th>Date</th>
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<tbody>
<tr>
<td>Alignment of Demand Days/Fleet Evolution</td>
<td>June 2011 &lt;complete&gt;</td>
</tr>
<tr>
<td>Identify airports and metro areas</td>
<td>June 2011 &lt;complete&gt;</td>
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<tr>
<td>Preliminary 2010 NAS-Wide results</td>
<td>Sept 2011 &lt;complete&gt;</td>
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<tr>
<td>2011 TAF available (internally)</td>
<td>Nov-Dec 2011</td>
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<tr>
<td>2020 &amp; 2030 NAS-Wide results</td>
<td>May 2012</td>
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<tr>
<td>Annual Service Volume results</td>
<td>June 2012</td>
</tr>
<tr>
<td>Metro Area analysis results</td>
<td>Sept 2012</td>
</tr>
<tr>
<td>Additional scenario results</td>
<td>Sept 2012</td>
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<tr>
<td>Coordinate with airports</td>
<td>4Q12/1Q13</td>
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<tr>
<td>Complete FACT3 report</td>
<td>March 2013</td>
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Agenda

• Airport Capacity Benchmarks
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FAA Airport Capacity Guidance

• Methods, approach, data sources, and coordination for capacity analysis will vary substantially with airport complexity and project scope

• Multiple FAA sources for capacity guidance:
  – AC 150/5070-6B Airport Master Plans
  – AC 150/5060-5 Airport Capacity and Delay
  – FAA Airport Benefit Cost Analysis Guidance
  – FAA JO 7110.65 Air Traffic Control
  – AC 150/5300 Airport Design

• Goal is to develop a capacity analysis that is reasonable, defensible, and adequate to inform project decisions
Capacity and Delay AC Replacement
AC 150/5060-5

Legacy
150/5060-5
~1983

Tech Center Draft AC + Rules of Thumb

Policy and Technical Guidance

Airside/Airspace Capacity and Delay Factors

Data Sources

ACRP 3-17 Capacity

ACRP 3-20 Delay

NPIAS Order Update

NextGen Performance Factors

New AC -6
~2013?
Guidance: Data Sources

• **Operational Data**
  – Surveillance data: FAA ASR, PDARS, airport systems (e.g., ANOMS)
  – Aviation System Performance Metrics (ASPM) @ aspm.faa.gov
    • Air Carrier movements: Gate Out, Wheels Off, Wheels On, Gate In (OOOI)
    • ETMS, ASQP, and other sources

• **ATC and Operators**
  – Coordination with the ATCT and/or TRACON is vital, early and throughout the project
  – Airline Chief Pilots can be excellent resources
  – Airline Gate Schedules

• **Other**
  – National Climatic Data Center – hourly weather observations
  – Bureau of Transportation Statistics – Airline Performance/Delays/Costs

Comprehensive, detailed data sources exist to support capacity analysis
Guidance: Metrics and Limitations

• Range of potential metrics:
  – Annual Capacity/Annual Service Volume (ASV)
  – Hourly Capacity/Throughput
  – 15-minute demand/capacity throughput can be helpful in examining impact of schedule peaks
  – Pareto curves can be useful in showing capacity ranges during Arrival Push, Departure Push, and Mixed Operations
  – Average Delay and 90th or 95th Percentile Delay

• Recognize Limitations, particularly for runway-centric models
  – Ability of the airspace to move aircraft to/from the runway
  – Taxi movements, runway crossings, and gates can be significant constraints
  – Weather: VFR/MVFR/IFR and Minimum Vectoring Altitude
Guidance: Key Points

• In an era of airline schedule uncertainty, evaluate demand levels not specific years
• Recognize effect of airline schedule peaks on results
• ASV is a screening tool not project justification
• Identifying airports as ‘congested’ or having ‘unacceptable delay’ is a moving target
• Recognize limitations of data and models in interpreting results
• Be wary of inadequate analysis – there is never time to do it right, but there is always time to do it over
• Adequate coordination with ATC and operators can substantially improve confidence in the analysis
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