Building the Next Generation Air Transportation System: Tackling the Challenges

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Why Do We Need NextGen?

- Aging Infrastructure reducing efficiency, increasing costs of air transportation
- Technology available now to facilitate
  - Increased safety
  - Enhanced efficiency, predictability
  - Enhanced fuel efficiency
  - Reduced impact on environment
- At risk of losing global leadership
  - Countries without legacy systems can leapfrog US
A Quick Overview of NextGen
Airport Surface

Reduce Delays, enhance safety, efficiency of surface traffic by:

- Enhancing situational awareness
- Capturing & disseminating data
- Establishing FAA Surface office
Arrivals and Departures

*Increase runway access to converging, intersecting and closely-spaced parallel runways by:*

- Using enhanced surveillance methods
Metroplexes

*Improve efficiency of cruise operations by:*

- De-conflicting adjacent airports traffic
- RNAV, with RNP where needed
- Optimized vertical profiles
- Use 3 NM rules in more airspace
- Enhanced airspace design
- Enhanced ATC, flow and surface TFM
Airborne Cruise

*Improve efficiency of cruise operations by:*

- Increasing dissemination of airspace status and schedules
- Time-based metering
- DataComm
General Aviation Access

*Improve access to non-OEP airports and low altitude, non-radar airspace by:*

- Precision-based airport approaches & departures,
- Expansion of surveillance services to areas not currently under radar surveillance
Controller-Pilot Communications & CDM

- Data comm to enable more efficient use of capacity.
- Tactical reroutes around weather and congestion
- CDM
Eliminating the Bottlenecks: Deploying Where the Problems Are

* Source: FAA
NextGen Core Technologies

• COMMUNICATIONS:
  – Controller-Pilot Data Digital Communications

• NAVIGATION:
  – Performance-Based Nav (RNP, RNAV)
  – Satellite-based Nav (ADS-B)

• SURVEILLANCE:
  – Satellite-based Surv (ADS-B)

• ATM-TFM:
  – Time-Based Traffic Flow Management
  – Efficient Airport Surface Operations
  – Controller Decision Support Tools

• SYSTEM-WIDE INFORMATION SHARING

NextGen Relies Increasingly on Integrated Cockpit and Ground Systems, Requiring Increased User Investments
Key Challenges

- NextGen is more than technology
- The devil’s in the details
- Path to NextGen is a partnership
  - Must work together to incorporate organizational and institutional changes necessary for success

Industry consensus: the biggest challenge to NextGen in not Technology but rather Policy, Procedures and Financing.
Airline Business Case

1. Capital available
2. Creates competitive advantage or remedies disadvantage
3. Confidence in execution
4. Payback less than 3 years

* From Delta Air Lines, NAC Business Case Working Group Co-Chair
Business Case Gap for Airline

Competing Priorities
Financial Incentives Help Close Gaps

- **GAP:** Costs exceed benefits
- **NO GAP:** Benefits exceed costs
- **Operator Costs**
- **Operator Benefits**

Incentives may be needed to reach this point

GAP: Mass Required for Benefits

Incentives needed if societal / system benefit target is beyond this point

Percent of NAS Users Equipped
# Diverse Users’ Needs

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<th>Business Case Closure Criteria</th>
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Components of Success: Technology is NOT the biggest challenge.

Aircraft Avionics

Controller Ground Automation

Decision Support Tools

Applications

Certified Avionics

Regulatory Approvals

Standards

Equipped Aircraft

Procedures

Policies

Training

Environmental Constraints Satisfied

Equipment Incentives

Positive Business Case for Operators

Ops Capability Yielding Benefits
Continued Partnership Will Help Ensure All the Pieces are in Place to Achieve the Benefits of Modernization