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February 27, 2013

Meeting Summary, February 7, 2013
NextGen Advisory Committee (NAC)

The eighth meeting of the NextGen Advisory Committee (NAC) held on February 7, 2013 at the Hotel Monaco Ballroom, Salt Lake City, UT convened at 9:00 a.m. The meeting discussions are summarized below. Attendees are identified in Attachment 1; the presentations for the Committee is Attachment 2 (containing much of the detail about the content of the material covered); the revised Terms of Reference approved by the Committee is Attachment 3; the Chairman's Report is Attachment 4; the FAA Report from The Honorable Michael Huerta, FAA Administrator is Attachment 5; the revised final report "Key City Pairs for Measuring NextGen Performance", approved by the Committee during the meeting is Attachment 6; and the outcome of the Committee Group Exercise is Attachment 7.

Welcome and Introductions

Mr. Bill Ayer, Chairman of Alaska Air Group and the Chairman of the NextGen Advisory Committee called the meeting to order and welcomed the NAC members and others in attendance. All NAC members and attendees from the public were asked to introduce themselves. (NAC and General Public Attendees are identified in Attachment 1) Chairman Ayer recognized new Committee members Frank Brenner from EUROCONTROL, Lillian Ryals of The MITRE Corporation, Mike Perrone of the Professional Aviation Safety Specialists (PASS), and Pamela Whitley from the FAA NextGen Office.

Designated Federal Official Statement

Designated Federal Official (DFO), The Honorable Michael Huerta, FAA Administrator read the Federal Advisory Committee Act notice governing the open meeting.

Approval of October 4, 2012 Meeting Summary

Chairman Ayer asked for consideration of the written Summary of the October 4, 2012 meeting. The Committee approved the Summary with no revisions or objections. He also asked for and received approval for a revised NAC Terms of Reference that reflect the new Chair and DFO changes, along with editorial clean-ups.

Chairman's Remarks

Mr. Ayer began his comments by stating his desire to build on the leadership of previous committee chairman Dave Barger; being optimistic as well as realistic. He acknowledged that there are doubters of NextGen and he wants to highlight implementation successes to keep grounded on the realities of what is occurring in the aviation industry. Reflecting on the previous

day's tour of the FAA En Route Center and the Tracon and tower facilities, he complimented the air traffic controllers and the FAA for the collaborative effort to implement the En Route Automation Modernization (ERAM), the new platform for managing air traffic and a key technology for NextGen. He also emphasized the need to use plain language when communicating about NextGen and that this would be the goal for the Committee Group exercise later in the meeting.

In his comments, he reviewed the goals of NextGen (increasing safety, capacity, and efficiency along with decreasing environmental impact) and the history of RTCA Task Force 5 (TF5). That initiative brought the aviation community together to provide the FAA with a prioritized list of operational capabilities, strategies to close the business case and coordinated implementation strategies. These recommendations have been integrated into the FAA's plans providing transparency in how the Agency has addressed each recommendation. He reminded the members of the Committee that the NAC was established at the recommendation of TF5 to provide the FAA with continued FAA-industry collaboration and consensus building on NextGen implementation, where FAA and all NextGen stakeholders would plan, execute and track NextGen, holding all accountable to commitments and tracking progress.

Mr. Ayer summarized the 19 recommendations delivered by the NAC to the FAA covering:

- Best-Capable, Best-Served
- Financial Equipage Incentives
- Prioritized Deployment Locations
- National Airspace System (NAS) Performance Metrics
- Environmental Review Process
- Trajectory Operations
- DataComm

He concluded this section by providing the following summary of the recurring themes from the Committee's recommendations to the FAA that build on the principles from TF5:

Capabilities – NextGen is about more than technologies. Policies and procedures must also be implemented along with requisite training and other components required to deliver the full benefits of NextGen**.**
Investment – more than any preceding modernization effort, NextGen will require substantial investment on the part of the operators.
Business Case – since NextGen requires unprecedented investments on the part of not only the FAA, but the operators and industry, there must be a positive business case for that investment.
Benefits – to encourage equipage, operators must be assured of realizing benefits within an agreed upon period of time.
Commitment – a key part of closing that business case is confidence that the FAA will deploy NextGen capabilities when and where promised, and that all stakeholders will adhere to commitments.

Metrics – Much of the work of the FAA and its NextGen stakeholders has revolved around defining the appropriate metrics against which we can collectively and transparently measure the success of NextGen.
Efficiency – A major goal of NextGen is to improve the efficiency of the Air Traffic Management System**.**
Transition – NextGen is not an end-state; it is a journey, with increasing capabilities delivering benefits and increasing stakeholder confidence along the way.

Gary Beck, Vice President of Flight Operations for Alaska Airlines, was then asked to provide an update on the Seattle Greener Skies implementation effort, including the Flight Trials, Environmental Study, Instrument Procedures Production and Post Implementation review. Mr. Beck emphasized that collaboration among the FAA, air traffic controllers, Port of Seattle, airlines, and The Boeing Company was necessary to make this work. An outcome is increasing arrival rates and deconflicting traffic with Boeing Field. In response to a question from a Committee member about the acceptance of the new procedures, he stated that the controllers and pilots were involved in the development process and are now working through the implementation. He commended the National Air Traffic Controllers Association (NATCA) for its support of the initiative. FAA officials commended Alaska Airlines for its work on the three-plus year Greener Skies project and helping to work through issues of pilot and controller involvement in the design and implementation process.

Concluding his remarks, Chairman Ayer outlined lessons learned from Alaska Airlines business transformation that could be instructive to the work of the Committee.

FAA Report
The Honorable Michael Huerta, Administrator, FAA presented the FAA report covering the following areas (details of his report are contained in Attachment 5):

- FAA/DOT Personnel Update – recent announcement by DOT Secretary LaHood that he will be leaving his position; the FAA is working on naming a new Deputy Administrator that will serve as the Agency's champion for NextGen as the Chief NextGen Officer; with the retirement of Vicki Cox, Pamela Whitley has been named as Acting Assistant Administrator for NextGen.
- Boeing 787 – addressed recent developments with the Boeing 787 aircraft.
- Budget/Sequestration – the FAA faces across the board budget cuts of 5% on March 1 (unless Congress acts) that will force the reduction of core services. (The original estimate of an 8.2 percent across-the-board cut has been reduced now to a 5 percent across-the-board cut for FAA.) In addition to the sequestration, the FAA does not have a budget approved for FY2013, currently funded by a Continuing Resolution that expires after March 27, 2013. After March 27, the agency will need an approved budget or another continuing resolution to keep operating.
- Update on DataComm – the FAA has committed to DataComm as the way of the future, awarding a contract in September to integrate DataComm into ground automation, telecommunications, security firewalls, air-ground network services and aircraft avionics. The FAA is considering the recommendations from the NAC as it determines how to move forward with

DataComm - a team of experts from across the agency, all of whom have a role in implementing DataComm, is analyzing and debating those recommendations in an orderly manner.

- NextGen Implementation Plan (NGIP) – the 2013 plan will be released in March.
- Harmonized Metrics – David Grizzle, Chief Operating Officer for the FAA Air Traffic Organization explained that the FAA has implemented the recommendations provided by the NAC at the October, 2012 meeting on City Pairs into its metrics reporting. The Agency is also incorporating recommended high-level metrics into its metrics harmonization process addressing various sources of performance metrics. Nancy Kalinowski, Vice President Systems Operations Services, FAA ATO provided the briefing of this initiative that will result in 26 metrics that will be presented on FAA's website.
- NextGen Optimized Profile Descents (OPDs) in metro Washington, DC – Lynn Ray, Vice President Mission Support, FAA ATO and David Surridge from US Airways explained the implementation of OPDs that were designed to improve the efficiency of operations by minimizing level-offs and track miles. The annual projections are for $2.3M in savings, $760K savings in fuel, a reduction of 7,300 metric tons of CO2 emissions and a reduction of 285K NM flight distance.

In response to a question from an FAA official about pilot acceptance of the procedures, Mr. Surridge commented that it is important to explain to pilots why the procedures are being implemented as well as identifying and resolving any issues that need to be mitigated and to add the procedures as a part of recurrent training. Another committee member asked about whether the new procedures required additional or new equipage, in reply it was stated that no new equipment was required. Subsequently, it was pointed out by a committee member that this principle of making use of existing equipment was a foundation of the TF5 recommendations. Other Committee members emphasized the culture changes by pilots and controllers that are necessary for successful implementation.

NextGen Implementation Metrics

Chairman Ayer introduced the co-chair of the NAC Subcommittee (NACSC), Steve Brown, Chief Operating Officer, National Business Aviation Association, who presented a briefing on the recommendation for key city pairs evaluation of Transcon/Regional City Pairs that can be used for NextGen metrics. Mr. Brown explained that at the request of the NAC during the last meeting, the NACSC reconvened the Key City Pairs Task Group to evaluate city pairs for transcontinental traffic and key city pairs for regional carriers.

Mr. Brown explained that the Task Group evaluated adding transcontinental city pairs to capture additional NextGen benefits in En Route airspace and concluded that it is relevant to include one representative Transcon city pair. There was a caution against overweighting Transcon pairings based on relevance for NextGen measurements. This includes the following characteristics of Transcon operations:

- Low operations numbers
- Low delay hours
- Variations of flight paths

The recommendation was to include New York - Southern California Transcon City Pair.

The Task Group also analyzed the possibility of adding one or more city pairs that have a significant representation by regional airline operators. The NAC had expressed a desire to capture city pairs in which aircraft spend most of the time on the surface and in arrival/departure phases of flight. In evaluating the list of 24 city pairs recommended to the FAA, it became apparent that these capture significant regional operations that include both short-lengths as well as long-haul regional flights.
For example, regional operations account for 50% or more of total operations in the following Key City Pairs:

- Chicago – Memphis
- Memphis – New York
- Charlotte – Chicago
- Charlotte – New York
- Six other city pairs included in the recommended list also include a significant percentage (nearly fifty percent) of regional operations.

It was recommended to the NAC that no additional regional city pairs are necessary.

Committee Action: The Committee agreed by consensus to approve the recommendation adding a transcontinental City Pair to its initial recommendation of 24 Key City Pairs (Metroplex Pairs) between which the FAA is measuring the impact of NextGen on NAS performance. The agreement to include the New York - Southern California Transcon City Pair helps capture additional NextGen benefits in En Route airspace. The revised version of the **Key City Pairs for Measuring NextGen Performance** will be submitted to the FAA.

In follow-on comments, Chairman Ayer encouraged the Committee members to visit the FAA NextGen website: <http://www.faa.gov/nextgen/snapshots/ to see the use of performance metrics from recommendations that have been made by the Committee.

Fuel Burn Data Source
Ed Lohr, Delta Air Lines and Debby Kirkman, The MITRE Corporation the co-chairs of the Business Case and Performance Metrics Work Group (BCPMWG) were asked by Chairman Ayer to review the initiative to identify and obtain critical data sources to track and analyze the impacts of NextGen on fuel usage. This work includes:

1) Establishing a team of Subject Matter Experts from the aviation industry and the FAA to establish detailed requirements for airline fuel and aircraft weight reports in support of high-level fuel efficiency metrics.
2) The continued research into the use of the Aviation Safety Information Analysis & Sharing (ASIAS) infrastructure to support both high-level and diagnostic-level metrics.

The BCPMWG is developing data sharing agreements with air carriers to support prototyping of public metrics using existing OOOI (out, off, on, in) ground and flight time data. In addition, an Ad Hoc group of airlines and other users has been created to consider options and recommend a data sharing governance and infrastructure program.

In response to a question from Mr. Huerta and subsequent comments from other Committee members, the co-chairs explained that the outreach and exploratory work is to determine if the data sources provided to ASIAS could be used, or if an ASIAS like structure should be developed. As an outcome of the discussion, it is apparent that members of the NAC would prefer deriving data from sources not directly provided to ASIAS.

A recommended course of action will be proposed for consideration at the June meeting of the Committee.

CatEx 2 Task Group

Mr. Brown, along with the co-chairs of the CatEx 2 Task Group, Nancy Young from Airlines for America and Katherine Preston from Airports Council International – North America provided a review of the work underway to develop a recommendation for implementing Congressional authority for Categorical Exclusions under the National Environmental Policy Act requirements (CatEx2). The FAA requested that the NAC explore how to implement Section 213(c)(2) of Public Law 112-95 for CatEx2 by reviewing the FAA's internal analysis, developing recommendations for measuring impacts on a per flight basis and determining whether additional recommendations for streamlining environmental reviews are needed. The briefers explained that the legislative authority is designed to foster the implementation of RNP but presents challenges in the requirements for identifying measurable reductions in fuel consumption, carbon dioxide emissions and most significantly, noise on a per-flight basis presents a challenge.

In response to questions from Mr. Huerta and other Committee members, the co-chairs outlined that the potential noise assessment, while effective for evaluating singular procedures, must be "scalable" in complex airspace and in locations with multiple procedures. The Task Group is doing additional analysis to make this determination and will be meeting with FAA environmental experts to outline the technical approach under development by the Task Group. In response to a question from Committee members, the co-chairs committed to briefing Congressional staff on the direction that the Task Group was taking in its recommendation.

Mr. Huerta emphasized the importance of having a "tool" that enabled the CatEx 2 provision to be implemented in Metroplex areas. Another Committee member from the FAA commented that the Congressional language should prompt people to look at the issue by aircraft flight – asking if the Task Group was not being open to a new way to do so. Ms. Young replied that the process to determine the impact must not be too complex (not require significant time), but the Task Group included experts on evaluating noise and has determined that the proposed modified noise contour was workable. She pointed out that the issue to be resolved is the application beyond "simple procedures."

Numerous members of the Committee commended the Task Group leaders for the work of the Group. A representative from the FAA commented that they were impressed by the level of work and the broad group of stakeholders that have been assembled with the right type of expertise – their hope is the Task Group can work through the identified issues.

The co-chairs specifically recognized Mary Ellen Egan of HMMH for her work in developing the noise analysis framework. Chairman Ayer concluded the discussion by thanking the Task Group, encouraging them to "keep up the good work" and expressing his enthusiasm for the recommendation that will be presented at the NAC June 4, 2013 meeting.

Obstacles to Performance Based Navigation (PBN) Utilization

Chairman Ayer introduced Steve Dickson, Sr. Vice President, Flight Operations, Delta Air Lines, NAC Subcommittee co-chair who reviewed the status of the Operational Capabilities Work Group (OCWG) efforts to identify obstacles to PBN utilization, both technical and non-technical, and recommendations to mitigate these barriers. He also called on Tom Bock from the Port Authority of New York and New Jersey to respond to questions as well. Tom serves as the co-chair of the OCWG along with Bill Murphy of the International Air Transport Association (IATA).

The following seven categories of barriers have been identified:

- Design
- Regulatory
- Automation
- Environmental
- Training
- Organization/Collaboration
- Mixed Equipage

A committee member from the FAA pointed out that the current work to revise and update the controller handbook was consistent with the areas identified and supports the efforts to address barriers to PBN implementation. Another Committee member explained that the Commercial Aviation Safety Team (CAST) had done work on safety enhancements and that the OCWG should coordinate with the FAA to ensure consistency and build on the existing data available. Jay Pardee was identified as the individual from the FAA to contact.

Mr. Dickson concluded the discussion by noting that from an operator perspective, the top three barriers were regulatory/policy, automation for the air traffic controllers and environmental issues.

A recommendation on the barriers and mitigations will be presented to the NAC at the June 4, 2013 meeting.

Open Discussion: Issues Associated with Implementing RNAV/RNP

Chairman Ayer introduced Margaret Jenny, President, RTCA who outlined the "workshop" portion of the meeting. Ms. Jenny introduced Jim Bowman, Vice President, Flight Operations and Dan

Allen, Senior Manager, Air Traffic Operations from FedEx Express who provided a "real world" operator's experience and perspective on implementing RNP including the opportunities for fuel savings, emissions reductions, improvements in efficiency, and the challenges to achieving the benefits needed to close the business case for equipping.

They explained that FedEx began using OPDs in 2009, emphasizing the importance of collaboration between controllers and pilots, as well as FAA certification/flight standards and air traffic organizations. Controller tools for timing and sequencing are vital to smooth operations of multiple streams of aircraft.

Ms. Jenny then explained that the various briefings and discussions during the day set the stage for a Committee group exercise with the assignment of developing a press release outcome associated with implementing PBN in a community. The output of the breakout groups (Attachment 7) emphasized the messages of concentrating on what matters to a traveler (enhanced safety, reduced delays, shorter flight times, fewer delays) and the community (less noise, lower emissions, maximizing existing physical infrastructure, improved access).

During review of the draft releases, Committee members commented that there must be a dialogue and outreach to the community and this must capture the positive aspects of RNP and the use of GPS technology including the benefits of dependability and reliability. The FAA has a role to play in explaining the aviation industry to the community and the value of the industry in a specific region/locale. Other members identified the need to engage and educate the community early in the process; include those outside of the traditional aviation industry (businesses, community leaders, etc.) and tailor the strategy for the community. It was also suggested that the outreach be timed to match the implementation of the procedures.

In concluding remarks, Committee members stated that the NAC "feels like a partnership"; hearing about successes is important and they look forward to this being a feature of future meetings; we should celebrate success, communicate success and be certain to connect success to what matters to communities and policy makers.

Chairman Closing
Chairman Ayer offered his closing remarks by thanking the NAC members for supporting him as chairman and stating that "collaboration" was the critical word for the meeting and for the future.

Other business
No other business was raised.

Adjourn
Chairman Ayer ended the meeting of the Committee at 2:45 p.m.

Next Meeting
The next meeting of the NAC is June 4, 2013 in Washington, DC.

Attendees:
February 7, 2013 Meeting of the NextGen Advisory Committee
Salt Lake City, UT

Name[1]	Company
Allen, Dan	FedEx Express
Ayer, Bill	*Alaska Airlines (NAC Chair)*
Batchelor, David	SESAR
Baum, Chris	ALPA
Beck, Gary	Alaska Airlines
Belger, Monte	Metron Aviation
Bertapelle, Joe	Jet Blue
Bock, Tom	PANYNJ
Bolen, Ed	*National Business Aviation Association*
Bowman, Jim	Federal Express Corporation
Brenner, Frank	*EUROCONTROL*
Brown, Steve	National Business Aviation Association
Carbary, Sherry	*The Boeing Company*
Carlson, Jeff	Utah Valley University
Cass, Lorne	Federal Aviation Administration
Cassidy, Sean	ALPA
Cebula, Andy	*RTCA, Inc. (NAC Secretary)*
Challan, Peter	Harris Corp
Clausen, Perry	Southwest Airlines
DeCleene, Bruce	Federal Aviation Administration
DeLeon, Benito	Federal Aviation Administration
Denning, Jana	Lockheed Martin Corporation
Dickson, Steve	Delta Air Lines
Esposito, Carl	*Honeywell International, Inc.*
Fearnsides, Jack	MJF Strategies
Fulton, Steve	GE Aviation
Gilbert, Patricia	NATCA
Gray, Bob	ABX Air
Green, Jim	Utah Valley University
Grizzle, David	*Federal Aviation Administration*
Harris, John	*Raytheon Systems Company*
Hickey, John	*Federal Aviation Administration*
Hill, Fran	Lockheed Martin Corporation
Hill, Stephanie	*Lockheed Martin Corporation*
Huerta, Michael	*Federal Aviation Administration*

[1] Committee member names appear in italics.

Attachment 1 Attendees

Hyde, Shuanta	The Boeing Company
Iversen, Jennifer	RTCA
Jenny, Margaret	*RTCA, Inc.*
Jones, James	*U.S. Air Force*
Kalinowski, Nancy	Federal Aviation Administration
Keegan, Charles	Raytheon
Kirkman, Debborah	MITRE
Land, Rob	Jet Blue
Leading, Kimberly	DOT IG
Lohr, Ed	Delta Air Lines
Manville, David	US Army
Mohler, Gisele	Federal Aviation Administration
Murray, Thomas	Insitu
Narvid, Juan	US Air Force
Newton, David	Southwest Airlines
Oettinger, Julie	*Federal Aviation Administration*
Perrone, Mike	*Professional Aviation Safety Specialists*
Preston, Katherine	ACI-NA
Rankin, Jim	Air Wisconsin
Ray, Elizabeth	Federal Aviation Administration
Rich, Nick	Utah Valley University
Rinaldi, Paul	*National Air Traffic Controllers Association*
Rocheleau, Chris	Federal Aviation Administration
Romanowski, Mike	White House OSTP
Ryals, Lillian	*The MITRE Corporation*
Sears, Bill	Beacon Management
Shellabarger, Nan	Federal Aviation Administration
Smith, James	Utah Valley University
Smith, Molly	Federal Aviation Administration
Smith, Steve	Utah Valley University
Surridge, David	US Airways
Treakle, Coletta	DOT IG
White, Beth	Federal Aviation Administration
Whitley, Pamela	Federal Aviation Administration
Williams, Heidi	AOPA
Wright, Dale	NATCA
Young, Nancy	Airlines For America

RTCA

THE GOLD STANDARD FOR AVIATION SINCE 1935

Welcome to the Meeting of the NextGen Advisory Committee

February 7, 2013
Hotel Monaco
Salt Lake City, UT

Welcome & Introductions

NAC Chairman Bill Ayer

Chairman

Alaska Air Group

RTCA

THE GOLD STANDARD FOR AVIATION SINCE 1935

Introductions

Meeting
NextGen Advisory Committee
February 7, 2013
Salt Lake City, Utah

PUBLIC MEETING ANNOUNCEMENT
Read by: Designated Federal Official Michael Huerta
NextGen Advisory Committee
February 7, 2013

In accordance with the Federal Advisory Committee Act, this Advisory Committee meeting is OPEN TO THE PUBLIC.

Notice of the meeting was published in the Federal Register on:

January 28, 2013 (Posted for review on January 24).

Members of the public may address the committee with PRIOR APPROVAL of the chairman. This should be arranged in advance.

Only appointed members of the Advisory Committee may vote on any matter brought to a vote by the Chairman.

The public may present written material to the Advisory Committee at any time.

Meeting Agenda

- Review & Approval
  - October 4, 2012 Meeting Summary
  - Revised Terms of Reference
- NAC Chairman's Report
- FAA Report
- NextGen Implementation Metrics
  - Key City Pairs – NextGen Metrics: Transcon/Regional Pairs
  - Data Sources for Measuring NextGen Fuel Impact
- Cat Ex 2 Task Group – Status & Discussion
- Operational Capabilities Work Group - Overcoming Barriers to PBN Implementation
- Open Discussion – PBN Implementation
- Other Business

5

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THE GOLD STANDARD FOR AVIATION SINCE 1935

Review and Approval of:

1. October 4, 2012 Meeting Summary
2. Revised NAC Terms of Reference (Chair and DFO changes/editorial clean-ups)

RTCA

THE GOLD STANDARD FOR AVIATION SINCE 1935

Chairman's Report

NAC Chairman Bill Ayer

Chairman

Alaska Air Group

Quick Refresher: Goals of NextGen

- Increase capacity
- Increase efficiency
- Increase safety
- Decrease environmental impact

FAA Request to RTCA, Feb 2009

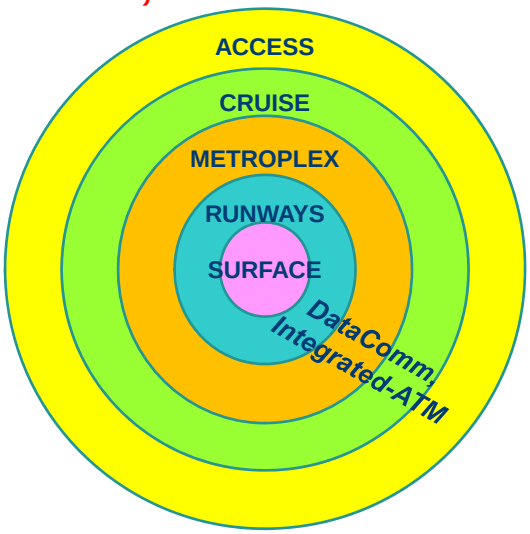
Establish Task Force to Recommend for Mid-term:

- ✓ Prioritized *Short* List of Operational Capabilities
- ✓ Strategies to Close the Business Case
- ✓ Coordinated Implementation Strategies

Task Force 5 Consensus Output

WHAT, WHERE, WHEN

- **Leverage Current Equipage**
- **Document Commitments**
- **Close Business Case**
- **Plan, Execute & Track Collaboratively**



The Devil's in the *Implementation* Details

10

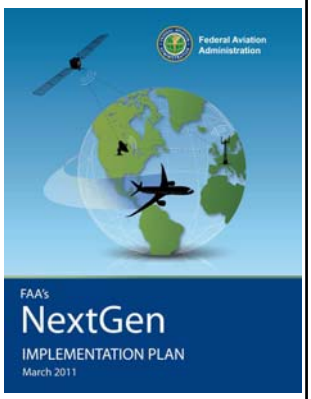
"Elements" * of TF5 Capabilities

- Change in Roles of Pilot, Controller, Dispatcher
- Technology/Equipage Required
- Technology/Equipage Available
- Decision Support Tools Required
- Policy Changes Needed
- Implementation Bandwidth Issues
- Airspace Changes Required
- Standards Required
- Ops Approval Required
- Certification Required
- Political Risk
- Training Required
- Links to Planning Documents

**** Documented for each operational capability***

FAA Incorporates TF5 Recommendations into Plans

- FAA worked with TF Leadership to understand recommendations and transparently integrate into The NextGen Implementation Plan
- FAA established NAC to continue collaboration on implementation
  - Requested Top- Level executives
  - Commitment to consensus
  - Focus on tough policy and implementation issues



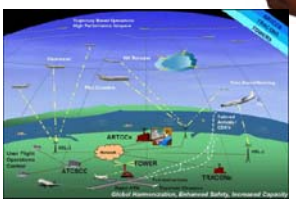
19 Recommendations Aimed at NextGen Implementation

- Best-Capable, Best-Served
- Financial Equipage Incentives

- Prioritized Deployment Locations
- NAS Performance Metrics

- Environmental Review Process

- Trajectory Operations



- DataComm

13

Capabilities

Benefits

Transition

Investment

Commitment

Business Case

metrics

Efficiency

Greener Skies Scope

i1 - Design/Implement PBN instrument procedures into a complex airspace, while providing an environment for research.

- OPD STARs and RNAV (RNP, GPS, RVFP) approaches
- Flight Simulation/Flight Trials
- Environmental Study / Flight Check
- Post Implementation
- GS i1 Complete

i2 - Evaluate concepts, research alternatives and establish requirements resulting in full implementation of PBN technologies within SEA/BFI airspace and NAS-wide.

- RNP Established
- Concurrent Approaches
- RNP to ILS Capture
- Procedurally Separating Arrivals/Departures

i3 – NAS Implementation of new procedure, rule making, and TFM/training.

- Implement RVFP, GVFP, RNP Establish, Concurrent, RNP to ILS
- Waivers and DCPs
- Ensure TFM/training is developed

Greener Skies i1 Status

Flight Trials:

- Special STARs (MARNR and HAWKZ) - June 11, 2012
  - Confirm ATC Procedures, Processes, and TFM
- 2,100 operations over 50 days – August 2, 2012

Environmental Study:

- Draft EA released June 27, 2012
- Public workshops held September 5-6, 2012
- Estimated Completion October 31, 2012

Instrument Procedure Production:

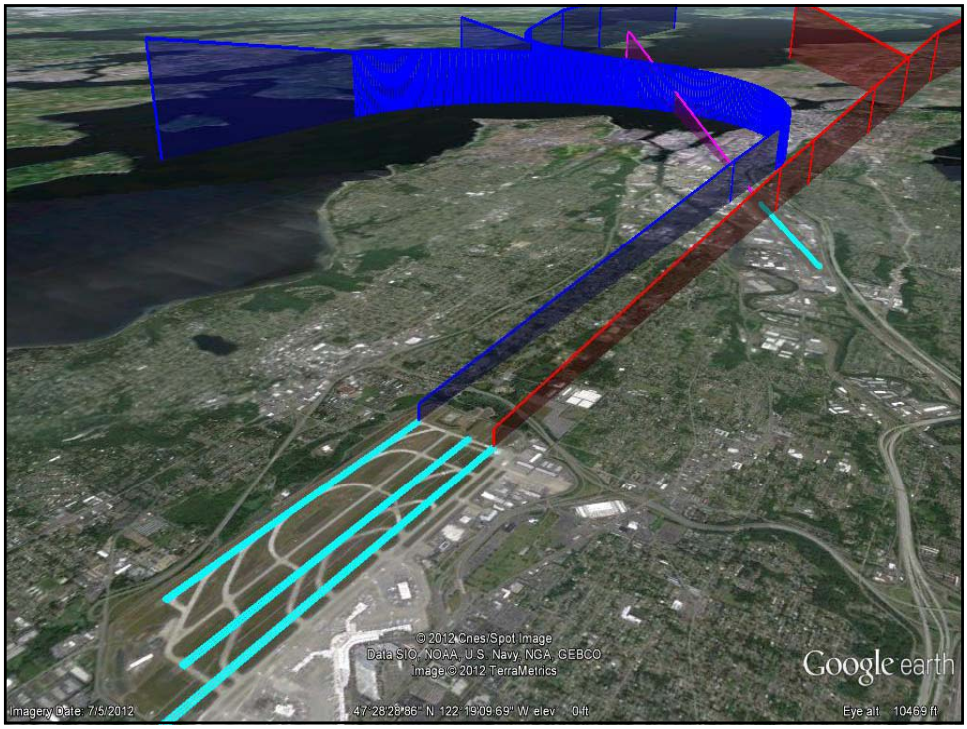
- Weekly review meetings with AeroNav Products OKC
- Flight Check completed December 28, 2012

Publication of Public Procedures:

- March 8, 2013
- Two IAP – RNP 0.3 and RNP 0.15
- Training ATC/Pilot
- Daily use March 20, 2013

Post Implementation:

- ATC and industry review
- GS i1 Complete April 18, 2013



Alaska Airlines Business Transformation

Lessons Learned

- Get the right people on the bus.
- Create a sense of urgency.
- Work on only one or two big ideas at a time.
- What you measure gets done.
- Focus on what you can control over the long-term.
- Be totally and completely customer focused.
- Don't confuse being popular with doing the right thing, at least in the short-term.
- Develop strategic partnerships.

Alaska Airlines

Alaska Airlines Business Transformation

Four Simple Principles

These are things your parents or grandparents probably told you
… and they're not very complicated:

1. Don't buy things you can't afford.
2. Don't borrow money you can't pay back.
3. Don't do deals you don't understand.
4. If it doesn't seem right, it probably isn't.

Alaska Airlines

FAA
Metrics Harmonization Effort
Current Status

Briefing to NextGen Advisory Committee

February 7, 2013

Genesis of Metrics Harmonization

FAA's Problem to solve:

- Increasing number of metrics floating across agency
- Inconsistent metric definitions inside and outside the agency
- Different data sources used for the same metric produced different results
- Multiple names used for the same metric definition
- Multiple definitions used for the same metric name

Solution:

Initiate an FAA-wide effort to review external and internal metrics the agency uses. Our purpose is to bring order, consistency, and accuracy to metric reporting, across all lines of business.

Metrics Harmonization

WHAT	Create consistency between FAA areas for metric definitions, terminology, data sources, and computation Avoid duplications of effort within the FAA Discuss stewardship and identify lead for each metric As appropriate, reduce the footprint of FAA metrics
HOW	Four-step process: Collect, Understand, Review, and Recommend
WHO	**FAA lines of business**: Finance (AFN), NextGen (ANG), Policy (APL), Airports (ARP), Air Traffic Organization (ATO), Aviation Safety (AVS) **Stakeholders**: RTCA, Business Case & Performance Metrics Work Group (BCPMWG), NextGen Advisory Committee (NAC)

Scope of work – Phase 1

- Externally-reported operational metrics
- Six International Civil Aviation Organization (ICAO) Key Performance Areas (KPAs)

Environment Noise, gaseous emissions, and other environmental issues	Safety Assessed against appropriate criteria and globally standardized safety management practices	Cost-effectiveness Cost of service to airspace users
Efficiency Operational and economic effectiveness of gate-to-gate flight operations from a single-flight perspective	Capacity Ability to meet airspace user demands while minimizing restrictions on traffic flow	Predictability Ability of airspace users and service providers to provide consistent and dependable levels of performance

ICAO KPAs not included in effort at this time: Global Interoperability, Flexibility, Security, Participation by the Air Traffic Management (ATM) Community, Access and Equity

FAA Metric Development Process

- Quarterly Meetings of Metrics Harmonization Team
- New Metric Development

#	Process Step	Typical Duration
1	Technical metric development a) Suggest exploring possibility or need for new metric	Up to 1 year
2	Metric testing, tracking, and baseline determination	Up to 1 year
3	Metrics Harmonization Team presentation and group discussion: implement final recommendations and set-up reporting	3 to 6 months

- Benefits of Process:
  - Creates a solid foundation for new metrics, with sufficient data for a baseline to use for computations
  - Ensures metric coordination across lines of business and agreement, before recommending a metric for reporting purposes

Metrics Harmonization – Involvement Briefings

- **FAA Internal Forums**:
  - NextGen Management Board (NMB)
  - Strategy, Budget, and Performance Committee (SB&P)
  - Service Area Leadership Council (ATO Field Directors)
  - FAA Administrator and Staff (January 2013)

- **External and/or Combined Forums**:
  - RTCA Business Case Metrics & Performance Workgroup
  - National Customer Forum (NCF)
  - Airlines for America (A4A)
  - General Aviation Manufacturers Association (GAMA)
  - NextGen Advisory Subcommittee

FAA Metrics Web Page

- 26 operational metrics derived from a high level of participation
  - All FAA lines of business agreed on metric definitions and computations, and reduced the agency's ***external metrics footprint***
- Metrics Web page to be used as a shared resource for all FAA lines of business, for all stakeholders, and for the public to have access to our externally reported operational metrics
- FAA Web page to launch in the second quarter of FY13
- These 26 Harmonized metrics include the FAA Modernization and Reform Act of 2012, Section 214, Performance metrics

FAA Metrics Web Page – Metric Examples

- **Example 1: ICAO Area – Capacity**

Metric Name	Definition	Unit	Reporting Scope	Reported Values	
Average Daily Capacity (ADC)	Sum of the number of flights the FAA facilities plan as capability for landings and take-offs in a month(s), divided by the number of days in the month(s).	ADC is measured as a number of departure and arrival operations	FAA computes this metric for National Airspace System (NAS) Core Airports and for times of day relevant to the operations.	Current Fiscal Year to Date (FY13) and comparable dates in FY12:	
				FY12 Oct to Dec	**FY13 Oct to Dec**
				60,435	59,665

- **Example 2: ICAO Area – Efficiency**

Metric Name	Definition	Unit	Reporting Scope	Reported Values	
Average Distance Flown between Key City Pairs	The Distance Flown is defined as the actual flown distance between wheels-off and wheels-on. The metric is reported as an aggregate for all key city pairs.	Nautical miles	FAA computes this metric for National Airspace System (NAS) Core Airports and for NAS Key City Pairs.	Current Fiscal Year to Date (FY13) and comparable dates in FY12:	
				FY12 Oct to Dec	**FY13 Oct to Dec**
				537	538

FAA Metrics Web Page – Metric Example 1
(continued)

Metric Name	Definition	Unit	Reporting Scope	Reported Values	
Average Daily Capacity (ADC)	Sum of the number of flights the FAA facilities plan as capability for landings and take-offs in a month(s), divided by the number of days in the month(s).	ADC is measured as a number of departure and arrival operations	FAA computes this metric for National Airspace System (NAS) Core Airports and for times of day relevant to the operations.	Current Fiscal Year to Date (FY13) and comparable dates in FY12:	
				FY12 Oct to Dec	**FY13 Oct to Dec**
				60,435	59,665

The Average Daily Capacity is computed using daily hourly-called arrival and departure rates at airports, also known as "published rates." FAA facilities continuously monitor and adjust these rates to reflect airport capability.

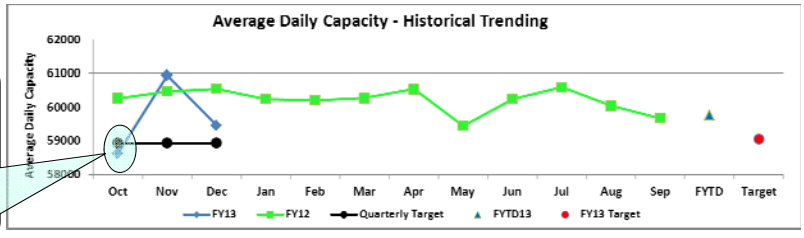
To increase the impact of the ADC metric, the ATO focuses on the hours of the day during which capacity matters the most. These hours capture periods when well over 90% of Core Airports' operations take place.

#	Core Airports	Reportable Hours		#	Core Airports	Reportable Hours		#	Core Airports	Reportable Hours	
1	ATL	0700	2259	11	HNL	0600	2259	21	MIA	0700	2259
2	BOS	0600	2159	12	IAD	0700	2259	22	MSP	0700	2259
3	BWI	0600	2259	13	IAH	0700	2159	23	ORD	0600	2159
4	CLT	0700	2259	14	JFK	0600	2259	24	PHL	0700	2159
5	DCA	0600	2159	15	LAS	0700	2159	25	PHX	0700	2159
6	DEN	0700	2159	16	LAX	0600	2259	26	SAN	0600	2259
7	DFW	0700	2159	17	LGA	0700	2159	27	SEA	0700	2159
8	DTW	0600	2259	18	MCO	0700	2159	28	SFO	0700	2259
9	EWR	0700	2259	19	MDW	0700	2059	29	SLC	0700	2159
10	FLL	0700	2259	20	MEM	0000	2359	30	TPA	0700	2259

FAA Metrics Web Page – Metric Example 1
(continued)

Metric Name	Definition	Unit	Reporting Scope	Reported Values		Historical Values
Average Daily Capacity (ADC)	Sum of the number of flights the FAA facilities plan as capability for landings and take-offs in a month(s), divided by the number of days in the month(s).	ADC is measured as a number of departure and arrival operations	FAA computes this metric for National Airspace System (NAS) Core Airports and for times of day relevant to the operations.	Current Fiscal Year to Date (FY13) and comparable dates in FY12:		• Click here
				FY12 Oct to Dec	**FY13 Oct to Dec**	
				60,435	59,665	

Want to learn more about historical values, trending, and metric status? Click here for details and latest updates.



The Oct 2012 ADC was below target due to Hurricane Sandy. Overall, FY13 is above target for Oct, Nov, and Dec.

FAA Metrics Web Page – Metric Example 2
(continued)

Metric Name	Definition	Unit	Reporting Scope	Reported Values	
Average Distance Flown between Key City Pairs	The Distance Flown is defined as the actual flown distance between wheels-off and wheels-on. The metric is reported as an aggregate for all key city pairs.	Nautical miles	FAA computes this metric for National Airspace System (NAS) Core Airports and for NAS Key City Pairs.	Current Fiscal Year to Date (FY13) and comparable dates in FY12:	
				FY12 Oct to Dec	**FY13 Oct to Dec**
				537	538

The average distance flown between city pairs is not currently part of any strategy for operational improvement. This computation is useful as long as it is tied to a higher level measure, such as the "filed versus flown" metric. Sometimes, just flying a shorter distance doesn't mean the operations are improved. Moreover, adverse conditions may require longer flown distances as the only option. This metric is part of the FAA Modernization and Reform Act of 2012, Section 214, Performance metrics, requirements.

FAA Metrics Web Page – Metric Example 2
(continued)

Metric Name	Definition	Unit	Reporting Scope	Reported Values		Historical Values
Average Distance Flown between Key City Pairs	The Distance Flown is defined as the actual flown distance between wheels-off and wheels-on. The metric is reported as an aggregate for all key city pairs.	Nautical miles	FAA computes this metric for National Airspace System (NAS) Core Airports and for NAS Key City Pairs.	Current Fiscal Year to Date (FY13) and comparable dates in FY12:		• Click here
				FY12 Oct to Dec	**FY13 Oct to Dec**	
				537	538	

To respond to the request of reporting for "Key City Pairs," the FAA put in place a NAC tasking letter to request input on the definition of a set of city pairs that are a good representation for the NAS, and also reflects operational improvements throughout our system. A preliminary list is used until the NAC task is completed.

#	Airport Pair		#	Airport Pair		#	Airport Pair		#	Airport Pair		#	Airport Pair	
1	ATL	EWR	11	BWI	ORD	21	DEN	ORD	31	IAD	JFK	41	LGA	MDW
2	ATL	FLL	12	CLT	DCA	22	DFW	IAH	32	IAD	LGA	42	LGA	MIA
3	ATL	LGA	13	CLT	EWR	23	EWR	FLL	33	JFK	MCO	43	LGA	ORD
4	ATL	MIA	14	CLT	IAD	24	EWR	MCO	34	JFK	MIA	44	MEM	ORD
5	BOS	BWI	15	CLT	JFK	25	EWR	MDW	35	JFK	ORD	45	MSP	ORD
6	BOS	DCA	16	CLT	LGA	26	EWR	MEM	36	LAS	LAX	46	ORD	PHL
7	BOS	EWR	17	CLT	ORD	27	EWR	MIA	37	LAS	SAN	47	PHX	SAN
8	BOS	IAD	18	DCA	EWR	28	EWR	ORD	38	LAX	PHX	48	SAN	SFO
9	BOS	JFK	19	DCA	ORD	29	FLL	JFK	39	LAX	SFO	49	SEA	SFO
10	BWI	CLT	20	DEN	LAX	30	FLL	LGA	40	LGA	MCO			

Next Steps for Metrics Harmonization

- Quarterly meetings will ensure continued engagement with all FAA lines of business
- Future work includes, but is not limited to:
  - Additional KPAs (e.g., Access and Flexibility) should be considered and included
  - Monitoring of metrics under development: Agencywide process will ensure ongoing followup, awareness, and meaningful discussion
- The Metric Harmonization Team recommended three new metrics, which are currently under development:
  - System efficiency
  - Efficiency in adverse weather conditions
  - Predictability

FAA Harmonized Operational Metrics

ICAO Area	#	Metric Name
Environment	1	Noise Exposure
	2	Renewable Jet Fuel
	3	NAS-wide Energy Efficiency
	4	Emissions Exposure (CO_2 Emissions)
Safety	1	Commercial Air Carrier Fatality Rate
	2	General Aviation Fatal Accident Rate
	3	System Risk Event Rate (SRER)
	4	Runway Incursions Rate (A&B)
	5	Hazard Risk Mitigations
	6	Commercial Space Launch Incidents
	7	Worldwide Fatal Aviation Accident Rate
Cost Effectiveness	1	The Administration's unit cost of providing air traffic control services

FAA Harmonized Operational Metrics (continued)

ICAO Area	#	Metric Name
Efficiency	1	Taxi-in Time
	2	Taxi-out Time
	3	Average Gate Arrival Delay
	4	Average Gate-to-Gate Times
	5	Distance at Level Flight from Top of Descent to Runway Threshold
	6	Flown versus Filed Flight Times for Key City Pairs
	7	Average Distance Flown between Key City Pairs
	8	Number of Arrival and Departure Delays
	9	Number of Operations
	10	NAS On-time Arrivals
Capacity	1	Average Daily Capacity (ADC)
	2	Actual Rates versus Published Rates
	3	Runway Pavement Condition
	4	Adjusted Operational Availability

Optimization of Airspace and Procedures in the Metroplex (OAPM)

Quantification of PBN Enabled Benefits

Federal Aviation Administration

Presented To: NextGen Advisory Committee - SC

Name: Elizabeth Ray, Vice President, Mission Support & Dave Surridge, Manager Flight Operations, USAirways

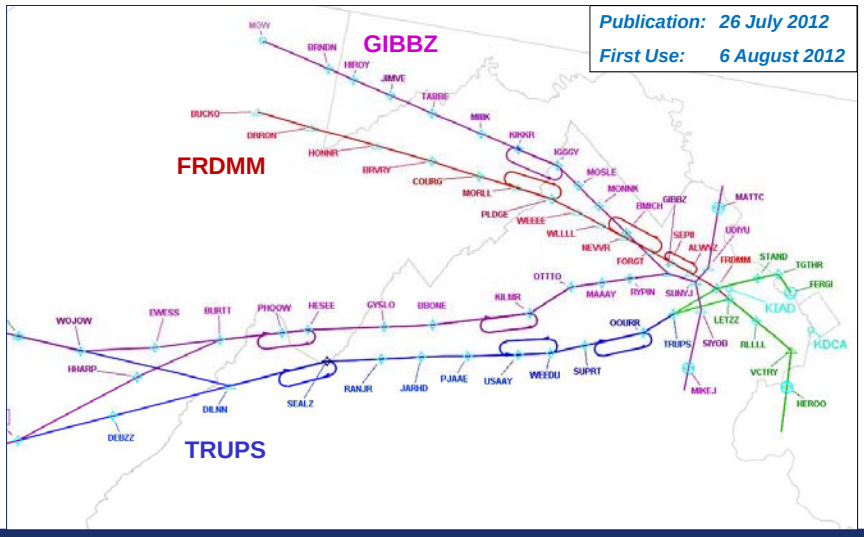
Date: February 7, 2013

Background

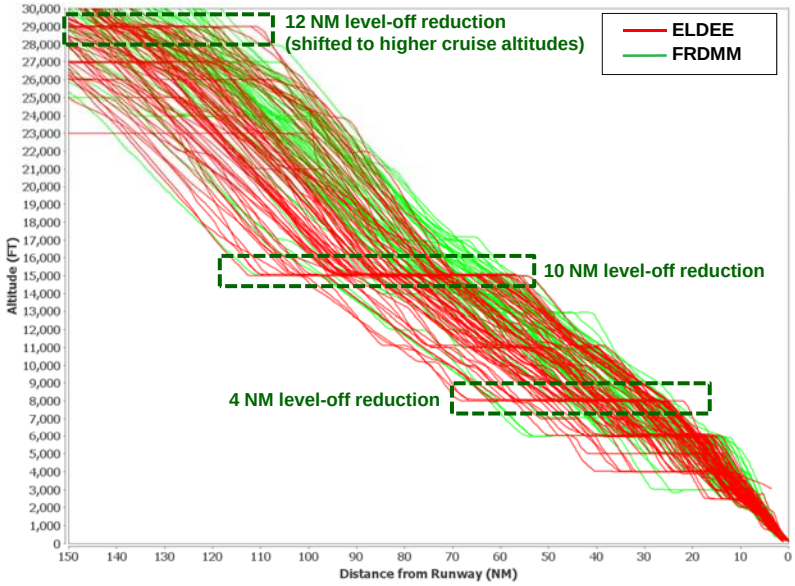
- **Three Optimum Profile Descent (OPD) Standard Arrival Routes (STARs) were implemented in the Washington, DC Metroplex**
  - FRDMM and TRUPS RNAV STARs to DCA
  - GIBBZ RNAV STAR to IAD
- **Capable aircraft are filing and flying the RNAV (OPD) STARs**

FRDMM, TRUPS, and GIBBS

RNAV OPD STARs



Detailed Level-Off Analysis: ELDEE vs. FRDMM



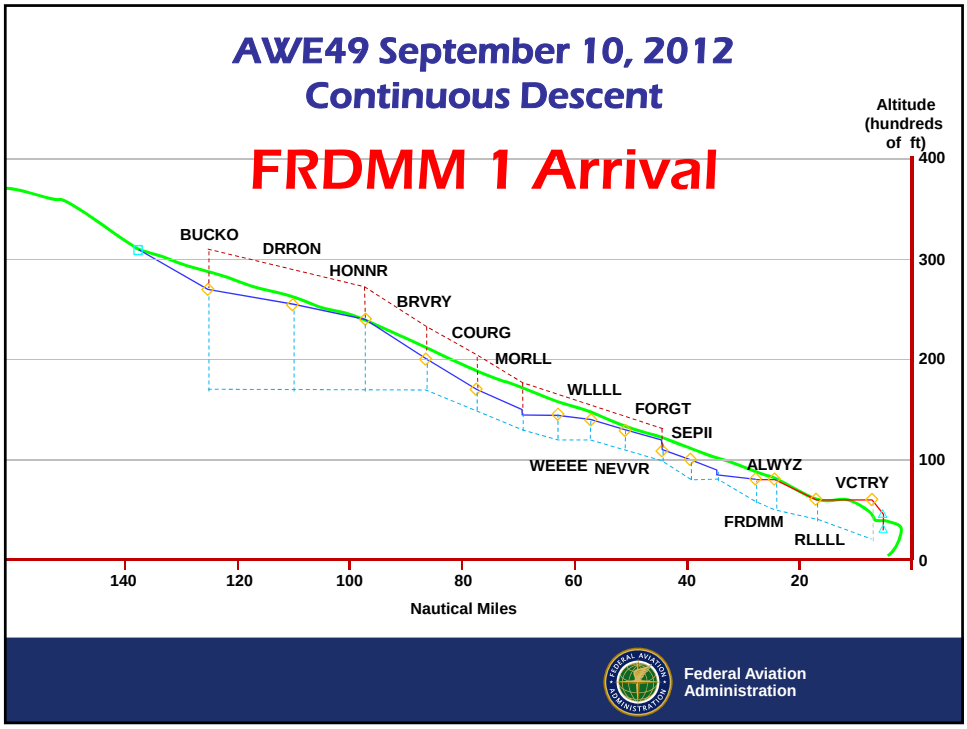
Benefits

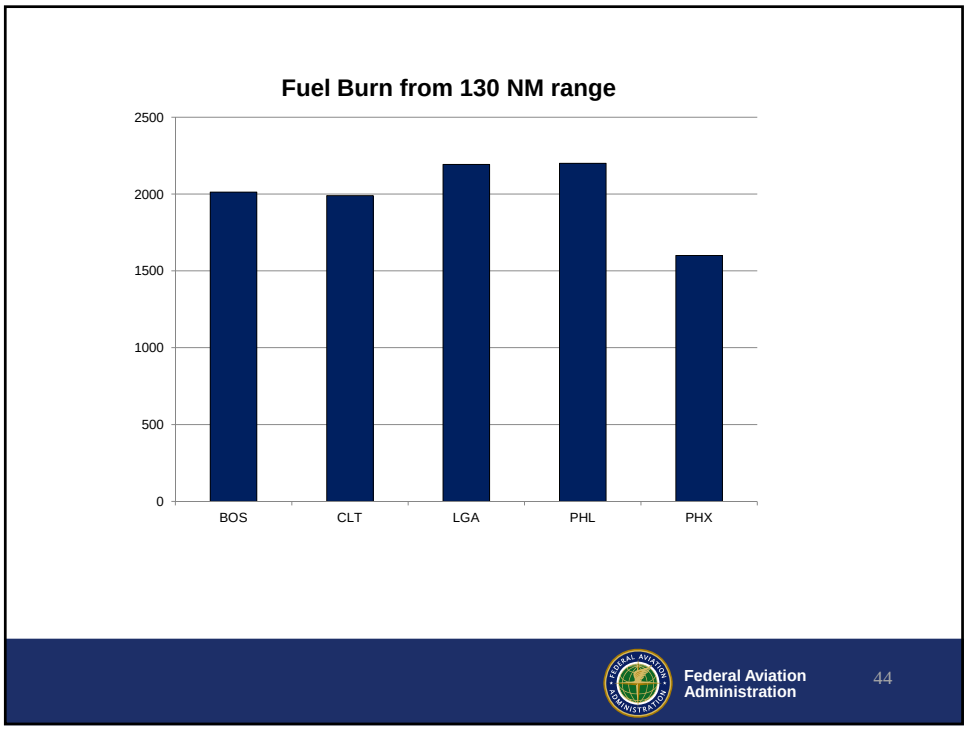
- 70% of eligible aircraft are using the OPDs, and utilization is expected to continue to increase
- The new procedures are reducing flying miles, level-offs, fuel burn, and emissions
- Analysis of radar track data using tools such as the PBN Dashboard are helping FAA evaluate and quantify benefits

Findings

Projected Total Annual Savings for FRDMM, TRUPS, and GIBBZ

- **Monetary Savings: $2.3 Million**
- **Fuel Savings: 760,000 US Gal**
- **CO2 Emissions Savings: 7,300 Metric Tons**
- **Flight Distance Savings: 285,000 NM**


AWE49 September 10, 2012
Continuous Descent
FRDMM 1 Arrival
Altitude (hundreds of ft)
400
300
200
100
0
BUCKO
DRRON
HONNR
BRVRY
COURG
MORLL
WLLLL
FORGT
SEPII
WEEEE
NEVVR
ALWYZ
VCTRY
FRDMM
RLLLL
140
120
100
80
60
40
20
Nautical Miles
Federal Aviation Administration


Fuel Burn from 130 NM range
2500
2000
1500
1000
500
0
BOS
CLT
LGA
PHL
PHX
Federal Aviation Administration
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Environmental and Economic Impact

Assumption

- Savings of 500 lbs per flight
- 482 flights per day at 30 OEP airports

Results

- 1.0 million gallons per day
- 4 million tons CO2 per year

  790 thousand vehicles off the road
- 1.2 billion dollars in savings per year

Evolution of Optimization

The future is now

- Rethinking the way we manage airspace
- Leveraging current technology
- The airspace is changing to leverage the technology

FAA and Industry working together

- Improved communications has resulted in improved results
- Bringing the pilot and controller together produces results
- Managing change can be a challenge

Going Forward

Continued improvements

- Design
- Criteria
- Technology

Continue to make the investment

- The environmental impact
- The economic impact

DISCUSSION

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Recommendation for Key City Pairs for Measuring NextGen Performance Transcon/Regional Analysis

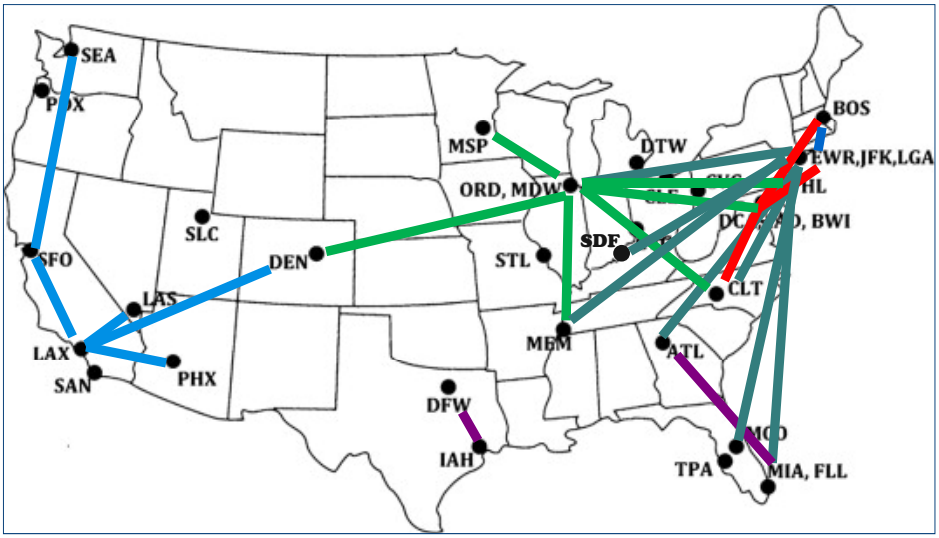
Steve Brown

NACSC Co-chair

FAA Tasking

- ***August 2012*** *-- "Leverage existing Metrics work to provide recommendations on the set of key city pairs mandated by FAA Authorization legislation that could be used for NextGen metrics by October NAC meeting."*
- *Task Group formed to provide expedited cross-Work Group expertise*
- ***NAC approved*** *recommendation of 24 pairs at October 4, 2012 meeting*

24 Key City Pairs (Metroplex Pairs)



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Key City Pairs Recommendation

Northern California - Southern California
New York - South Florida
Chicago - New York
Boston - Washington DC
New York - Orlando
Atlanta - New York
Charlotte - New York
New York - Washington DC
Las Vegas - Southern California
Boston - New York
Dallas - Houston
Charlotte - Chicago
Charlotte - Washington DC
Chicago - Washington DC
Phoenix - Southern California
Chicago - Philadelphia
Chicago - Denver
Atlanta - South Florida
Chicago - Minneapolis
Denver - Southern California
Northern California - Seattle
Chicago - Memphis
Memphis - New York
Louisville - New York

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NAC Feedback from October 4

- Consider adding transcontinental city-pairs to capture additional NextGen benefits in en route airspace
- Consider adding one or more city pairs that have a significant representation by regional airline operators
  - In particular, capture city pairs in which aircraft spend most of the time on the surface and in arrival/departure phases of flight.

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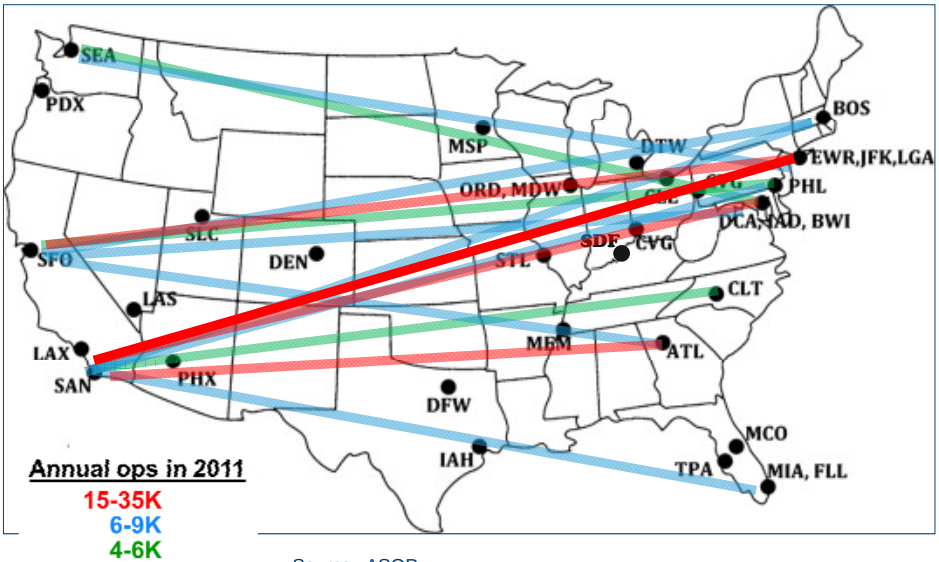
Candidate Transcon City Pairs



Source: ASQP

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Task Group & NACSC Recommendation

- Recommendation: New York - Southern California
- Relevant to include a representative Transcon Pair
- Caution against overweighting on relevance for NextGen measurements
- Based on the characteristics of Transcon – one is sufficient
  - Low operations numbers
  - Low delay hours
  - Variations of flight paths

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Current City Pairs & Regional Airline Operations – Note High % of Reg Ops

Regional %	Metroplex1	Metroplex2
95%	Chicago	Memphis
54%	Memphis	New York
53%	Charlotte	Chicago
51%	Charlotte	New York
49%	New York	Washington DC
46%	Charlotte	Washington DC
30%	Boston	New York
30%	Phoenix	Southern California
27%	Atlanta	New York
26%	Dallas	Houston
24%	Chicago	Philadelphia
22%	Chicago	Denver
22%	Chicago	New York
21%	Denver	Southern California
20%	Northern California	Southern California
16%	Chicago	Minneapolis
15%	Chicago	Washington DC
15%	Las Vegas	Southern California
11%	Boston	Washington DC
5%	New York	Orlando
2%	Atlanta	South Florida
2%	Northern California	Seattle
0%	New York	South Florida

Carrier Name	Count	Airport 1	Airport 2	Metroplex1	Metroplex2
Delta	377	MEM	ORD	Memphis	Chicago
ExpressJet	2,492	MEM	ORD	Memphis	Chicago
SkyWest	917	MEM	MKE	Memphis	Chicago
Atlantic Southeast	258	MEM	ORD	Memphis	Chicago
Atlantic Southeast	544	MEM	MKE	Memphis	Chicago
American Eagle	2,452	MEM	ORD	Memphis	Chicago
SkyWest	230	MEM	ORD	Memphis	Chicago
Mesa	174	MEM	ORD	Memphis	Chicago

Chicago-Memphis is primarily served by Regional Operators

Source: ASQP, ETMS

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Task Group & NACSC Recommendation

- Finding/Recommendation: No Additional Regional City Pairs are necessary
- List of 24 captures regional operations and includes short-length as well as long-haul flights
- Regional operations account for 50% or more of total operations in following City Pairs:
  - Chicago – Memphis
  - Memphis – New York
  - Charlotte – Chicago
  - Charlotte – New York
- Other included city capture significant % of reg opns

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NAC Action

Consider Recommendation on:

Transcontinental & Regional Key City Pair Recommendation and Transmit to FAA

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Data Sources for Measuring NextGen Fuel Impact
Business Case & Performance Metrics

Co-chairs:
Debby Kirkman, The MITRE Corporation
Ed Lohr, Delta Air Lines

Review from October Meeting
Fuel Data Benefit

Many NextGen improvements have a direct impact on fuel use through more efficient procedures

- FAA Reauthorization Bill, section 214, specifies the reporting of fuel use between "key city pairs"
- FAA should report on weight and normalized distance fuel efficiency for key city pairs (NAC recommendation)

Insufficient data granularity is available to FAA to generate the congressionally mandated metrics or to generate diagnostic metrics that help explain why changes have occurred

From NAC Oct Meeting Summary

Committee Approved:

1) establishing a team of Subject Matter Experts from the aviation industry and the FAA to establish detailed requirements for airline fuel and aircraft weight reports in support of high-level fuel efficiency metrics;

2) the continued research into the use of the Aviation Safety Information Analysis & Sharing (ASIAS) infrastructure to support both high-level and diagnostic-level metrics.

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Business Case & Performance Metrics WG: 2013 Goals

- Develop fuel data sharing mechanism(s) to inform Congress, NAC, and other NextGen metric analyses and tracking.
  - Any data sharing mechanism must ensure that sensitive data is protected from unauthorized access
  - Governance and data collection and sharing is key question to resolve
- As a first step, use sample OOOI data to prototype metrics to understand data limitations, data aggregation issues, and variances within the data

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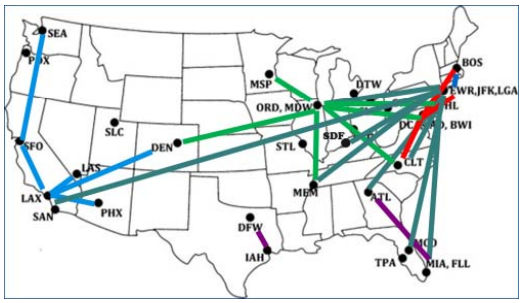
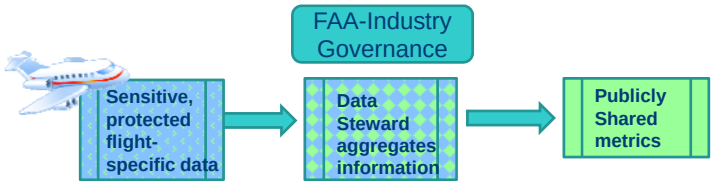
Concept for Public Metrics Generation



- Fuel used between city pairs
- Fuel normalized to weight and distance (ton-miles/gallon)



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Governance & Infrastructure Sizing

- Desired data granularity drives governance and infrastructure sizing:
  - High-level data only: Simple data sharing agreements and data conduit(s)
  - Detailed data: More complex and robust governance due to data volumes and sensitivities
- We have consistently heard that detailed data is preferred from all constituencies
  - Enables separation of NextGen from other fuel efficiency influences
  - Allows discrete post-implementation analysis of NextGen capability deployments

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Governance / Infrastructure Example

- ASIAS governance and infrastructure is one example of how detailed data sharing might work:
  - Data contributed to ASIAS by users remains property of user; destroyed after 3 years
  - Data steward protects user's data within a firewall against discovery, disclosure, or FOIA
  - Data steward analyzes data and creates reports within firewall
  - Governance body oversees reports and analysis; determines what information is made available internally / externally

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Next Steps

- Continue development of OOOI data sharing agreements and prototyping of public metrics using OOOI data
- Convene Ad Hoc group of airlines and other users to consider options and recommend a data sharing governance and infrastructure

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DISCUSSION

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CatEx Task Group - Steve Brown, NBAA
NACSC Co-Chair

Co-Chair CatEx 2 Task Group:
Nancy Young, Airlines for America
Katherine Preston, Airport Council International, North America

Refresher on NAC Tasking on "CatEx 2" - Background

- **Explore means of implementing a particular provision in the FAA Reauthorization Legislation (Public Law 112-95)**
- **Section 213 seeks to accelerate NextGen elements**
- **Section 213(c)(1) and (2) add legislatively mandated "Categorical Exclusions" under National Environmental Policy Act (NEPA) review requirements**
  - FAA has now issued guidance for implementing 213(c)(1)
    - Covers FAA-identified RNAV & RNP procedures at core airports and others in vicinity
  - FAA is unsure how to implement 213(c)(2) ("CatEx2")
- **Tasking for 213(c)(2) spelled out in September 21 letter to the NAC and RTCA**

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CatEx Task Group Members

Dan Allen, Federal Express
Fred Bankert, MITRE
Andy Cebula, RTCA
Perry Clausen, Southwest Airlines
Mel Davis, NATCA
Mary Ellen Eagan HMMH
Dan Elwell/Leslie Riegle, AIA
Margaret Jenny, RTCA
Nate Kimball, PANYNJ
Sandy Lancaster, DFW
Robert Luhrs, Raytheon Systems
Lourdes Maurice, FAA (SME)
Dennis McGrann, NOISE
Dan McGregor, The Boeing Company
Glenn Morse, United Airlines
Katherine Preston, ACI - NA
TJ Schulz, Airport Consultants Council
Bill Sears, FAA (Observer)
Ken, Shapero, GE Aviation
Scott Tatro, Los Angeles World Airports
Emily Tranter, NOISE
Travis Vallin, jviation
Nancy Young, A4A

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Methodology & Structure of Analysis

- Three meetings: Nov/Dec/Jan
- Consensus agreement on the scope of the task.
- Reach shared understanding on the intent, goal and application of the CatEx2 provision.
- Develop baseline, high level understanding of NEPA and FAA Noise modeling and assessment.
- Review analysis work conducted by the FAA on implementation CatEx2 language.
- Evaluate other possible approaches to implementing “per flight” noise measurement techniques to implement CatEx2 provision.
  - If yes, develop recommendation
  - If no, develop suggested revisions to statutory language or other way forward

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Key Issue in Tasking – How to Assess “Measurable Reductions” in Noise on a “Per-Flight” Basis

The Categorical Exclusion in Section 213 (c)(2), Acceleration of NextGen Technologies:
“Any navigation performance or other performance based navigation procedure developed, certified, published, or implemented that, in the determination of the Administrator would result **in measurable** reductions in fuel consumption, carbon dioxide emissions, and noise, **on a per flight basis**, as compared to aircraft operations that follow existing instrument flight rules procedures in the same airspace, shall be presumed to have no significant affect on the quality of the human environment and the Administrator shall issue and file a categorical exclusion for the new procedure.”

Congressional Language and Input from Hill Staff

•Overall Purpose – Facilitate implementing RNAV/RNP approaches

•Per Flight Basis further defined in *Conference Report* accompanying the bill.

House bill modified to change language to separate OEP and non-OEP airports to establish separate timelines and milestones, to require the FAA to provide a categorical exclusion for RNP/RNAV procedures that would lead to a reduction in aircraft fuel consumption, emissions and noise **on an average per flight basis …**

Outcomes

- Reached consensus on tasking - review FAA's analysis of the various noise metrics, determine if any of them are sufficient to meaningfully measure per flight noise, or suggest another metric that would be sufficient to measure noise on a per flight basis. Beyond that, if there is no technical and/or meaningful way to do so, recommend possible policy or legislative solutions.
- Recognition that transparency and defensibility of a solution are important to effective implementation. If communities don't understand or accept what FAA is doing, they could raise objections, and that could defeat the effort to accelerate PBN procedures.
- Recognition that CatEx1, and FAA's issuance of guidance on it, should provide some expediency for procedures at "core airports" and those in the same Metroplex.

Outcomes (cont. 1)

- Reached consensus on scope of CatEx 2: applies to airports beyond the core airports (although it applies to those as well), and does not allow for consideration of extraordinary circumstances if the three requirements are met (reduced fuel burn, CO2 emissions and noise on a per flight basis).
- Review of FAA's analysis - big picture observations:
  - FAA did a nice job of laying out the options they analyzed/good technical work
  - Recognition that aircraft "noise" does not only involve sound energy, it involves the exposure of people to the sound energy
  - Each of the options FAA identified raises questions regarding the degree to which the option would capture peoples' exposure to aircraft noise

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Outcomes (cont. 2)

- Review of FAA's analysis on specific options:
  - DNL Metric Option
    - Concur with FAA finding that DNL is a cumulative measure and that logarithmic DNL calculations cannot be divided by the number of aircraft to produce noise "per flight" values
    - Note that while it is technically feasible to construct DNL for a particular flight (i.e., a "partial DNL"), it would not necessarily reflect the noise exposure of the broader population on the ground.
    - If FAA were to take this approach, it would have to define a point at which it would measure and compare this for PBN versus non-PBN procedures. Recognize that this likely would not be accepted by the community.

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Outcomes (cont. 3)

- Review of FAA's analysis on specific options (continued):
  - Aircraft Noise Certification Levels
    - Concur with FAA finding that noise certification data cannot be used to compare noise levels of different procedures for an aircraft.
    - Noise certification levels are measured at three fixed points in set procedures designed for the certification test. These levels would not change based on navigation procedure, and therefore there is no way to determine if there is a reduction in noise based on navigation procedure.
    - Concur with FAA that noise certification levels cannot reasonably be used to implement CatEx2.

Outcomes (cont. 4)

- Review of FAA's analysis on specific options (continued):
  - Time Above Threshold
    - Concur with FAA that this measures duration of noise event, but not the level of noise.
    - While the duration of noise could decrease on a per-flight basis, the maximum sound level could increase.
    - If FAA were to take this approach, it would have to make a determination that a shorter duration of noise with a PBN procedure as opposed to without a PBN procedure was a reasonable proxy for the population's noise exposure, without respect to the noise level(s) at different points of exposure. Recognize that this likely would not be accepted by the community.

Outcomes (cont. 5)

- Review of FAA's analysis on specific options (continued):
  - Maximum Sound Level (LAMAX)
    - Concur with FAA that this measures the level of noise, but not the duration.
    - While it is technically feasible to measure LAMAX on a per flight basis, the measurement would not be the same for each point on the receptor grid. Selection of points on the ground presents a problem for this metric. While FAA could make a judgment call regarding the points on the ground to assess, there could be seen as arbitrary and likely would not be accepted by the community.

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Outcomes (cont. 6)

- Review of FAA's analysis on specific options (continued):
  - Sound Exposure Level (SEL)
    - Concur with FAA that this is the best of the options FAA studied, as it captures both duration and noise level and, as a building block for DNL, is a recognized metric.
    - While it is technically feasible to use SEL on a per flight basis, the measurement would not be the same for each point on the receptor grid. Selection of points on the ground presents a problem for this metric. While FAA could make a judgment call regarding the points on the ground to assess, there could be seen as arbitrary and likely would not be accepted by the community.

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Outcomes (cont. 7)

- At December Task Group meeting: Identified another potential approach to noise assessment on a per-flight basis:
  - "Modified Contour Overlay" (Term made up by the Task Group)
    - Agreed that a sub-task-group would work to better define the approach and would report back. If analysis were necessary beyond what the sub-task-group could perform, query FAA as to whether it would be willing to do analysis.
    - That work was matured by a sub-group and various elements and sub-options were presented to the full Task Group on January 11
- At January 11 Task Group meeting: Observed that the approach (one particular suboption for implementing it) was promising, pending further review and understanding of relative benefits of this approach as compared to other potential approaches

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Overview of Potential Approach

Step 1. Determine noise-sensitive "area of concern", e.g. DNL 45:

- FAA Order 1050.1E identifies evaluation of changes in DNL to levels as low as DNL 45 dB
- FAA also suggests DNL 45 dB is lower limit of INM's computational reliability

Step 2. Determine change in contribution to DNL on a per-flight basis, by Detailed Grid Computations, comparing existing procedure to proposed procedure at noise-sensitive locations

- Uses DNL as metric (i.e., consistency with FAA policy)
- NOTE: Other sub-option would be to use SEL, but the group determined that that approach raised issues/problems with acceptance that DNL would not

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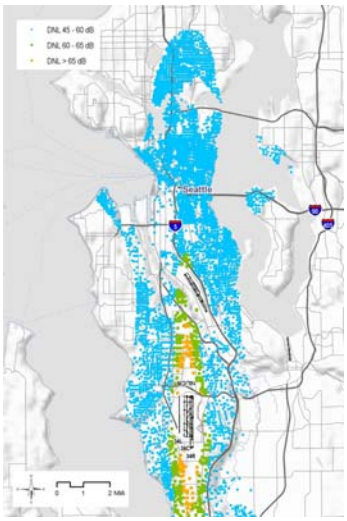
Initial Analysis Provided by HMMH (Mary Ellen Eagan) on a Voluntary Basis – MANY THANKS!



Example: Seattle Greener Skies

Step 1: DNL estimates of exposed population in "area of concern"

Affected Population	
DNL	Population
>65	8,493
60-65	45,084
45-60	611,203

Step 2: Use Grid Analysis to show population exposure with and without new procedure

Example of Potential Output from Analysis

DNL Level	Number of people exposed to DNL Level in existing versus PBN procedure		
	Contribution to DNL by procedure INCREASES	Contribution to DNL by procedure DECREASES	Contribution to DNL by procedure UNCHANGED
45-50	16,823	38,384	264,717
50-55	7,251	56,061	129,290
55-60	91	11,293	94,649
60-65	0	0	46,660
65-70	0	0	8,672
70-75	0	0	4
75-80	0	0	0
Total	24,418	105,738	543,992

*results of the population analysis for the NIRS modeling at SEA. The analysis covered the 40,788 census grid points used for the NIRS modeling; of which 7,876 fall at or above a total DNL of 45 dB in the original/non-Elliott Bay track case.

Issues Flagged Up

Key Issue 1: The CatEx itself requires noise analysis to show noise benefit of procedure

- That necessarily will take time and resources to determine
- If approval under a pre-existing FAA CatEx (not CatEx2) takes an average of 8 weeks (approximate), is it "acceptable" if process for CatEx2 takes somewhat longer than that?
- If not having a CatEx, and having to do an "Environmental Assessment" (EA), takes approximately 18 months and requires analysis of all environmental effects (not just noise), if this approach can save significant time (e.g., a year or more) and resources, is that reasonable?

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Issues Flagged Up (cont'd)

Key Issue 2: Most projects involve multiple procedures to different runway ends, all in the same airspace quadrant, but this metric works best for a single procedure.

- It's possible for one procedure to meet the CATEX2 terms using this metric, while another (even the same procedure to different runway end) might not
- This would raise issues of segmentation and cumulative impacts

Key Issue 3: Should existing NEPA significance criteria be applied (i.e., no increase in DNL of 1.5 dB within DNL 65) before CATEX 2 and this metric can be considered?

Key Issue 4: Although this approach uses the accepted metric of DNL, it may be somewhat difficult to explain to communities and therefore be a cause of concern.

Note: No other technical approaches have been identified

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Next Steps

- Next Task Group meeting (call) February 11
- Additional research/analysis
- Consider policy implications of recommended metric (if any) or alternative routes to meet Congressional intent of expediting NextGen implementation
- March 19 meeting -- Development of final recommendation
- NACSC May 8
- NAC June 4

DISCUSSION

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Lunch

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Operational Capabilities Work Group Update
Steve Dickson, Delta Air Lines (A4A) NACSC Co-Chair

OCWG Co-Chairs:
Tom Bock, Port Authority of New York & New Jersey
Bill Murphy, International Air Transport Association

Task 1: Obstacles to Performance Based Navigation Utilization

- Examine and expand, if necessary, on the potential obstacles to PBN utilization already identified by the FAA's internal analysis, including both technical and non-technical obstacles.
- Provide specific remedies and incremental action steps, including both technical and non-technical, the FAA can take as well as specific remedies and incremental action steps, including both technical and non-technical, for industry to take in order to relieve these obstacles in the near term.

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Obstacles to Performance Based Navigation Utilization

- Reviewed FAA Lentini Report
- Reviewed ICAO and PARC documents
- Discussions with various stakeholders
- Identified additional obstacles to PBN
- Organizing list into categories
- Working on priority of obstacle from industry position

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Obstacles to PBN Categories

- Design
- Regulatory
- Automation
- Environmental
- Training
- Organization/Collaboration
- Mixed Equipage

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Design

- What is the goal of the design? (Access, Efficiency, Environmental, Safety, Redundancy) Collaboration amongst **ALL** stakeholders paramount to ensuring goal is achievable.
- Performance Based Operations vs PBN
- Lack of integrated planning: Navigation – Surveillance – Communications
- RNP and RNP AR Fix names different when overlying existing ILS procedures which increased:
  - Application difficulty
  - Controller workload
  - Controller video mapping clutter

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Regulatory

- Qualification Barriers (Initial & Recurring Qualifications) and expense has drastic impact on cost benefit for equipage:
  - RNP/AR is too difficult and/or costly for the vast majority of Part 91 Operators
  - AFS has chosen to exclude RNAV Visual Flight Procedures and Vertical Navigation (VNAV)
  - Approach Procedures using DA(H); OpSpec C073 from use by Part 91 for non-operational reason
- 7110.65 changes hard & cumbersome
- Existing criteria in charting, coding, procedure design does not fully support new concepts (e.g., DEN ILS approach transitions)

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Automation

- Controller decision support needed to:
  - Denote aircraft equipage/capability
  - RAIM for the procedure
  - Aid controller in mixed equipage

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Environmental

- Create a dual path review process for quick administration issues such as adding or subtracting comments and longer review path when vertical/lateral changes are requested.
- Adding at/above restrictions takes longer than it should

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Training

(Pilots, Dispatchers, FMS Database Providers, Designers & Controllers)

- Both controllers and procedures staff need to understand the difference in flight characteristics
- Design teams need to understand how to deal with situations that are not in conformance with conservative design standards (e.g. ORD procedures with climb gradient issue)
- Need national “lessons learned” library so each development at different locations has experience source
- Controllers are not always training in how to use available procedures

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Organization/Collaboration

- Ineffective change management practices
- Lack of end user collaboration in designing procedures
- Lack of a well-articulated and commonly agreed upon set of design goals

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Mixed Equipage

- Equipment codes may not fully describe aircraft/crew operational capability
- ATC will revert to ILS unless the local controllers have made a concerted effort to assign the RNP approaches to RNP airplanes that happen to be grouped together on arrival
- Mixed Equipage results in Human Interface Issues – More than a training issue

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DISCUSSION

PBN Obstacles

NAC Members: From your perspective, pick top 3 categories of PBN obstacles for WG on which to focus mitigations.

- Design
- Regulatory
- Automation
- Environmental
- Training
- Organization/Collaboration
- Mixed Equipage

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Open Discussion: Issues Associated with Implementing RNAV/RNP

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Group Exercise

View from an air carrier	1:30 – 1:45
Envision Ideal future *(ops capabilities)*	1:45 – 1:50
Groups Write Press Release	1:50 – 2:10
Groups Report Out	2:10 – 2:30
NAC Discuss Gaps & Mitigations	2:30 – 2:50

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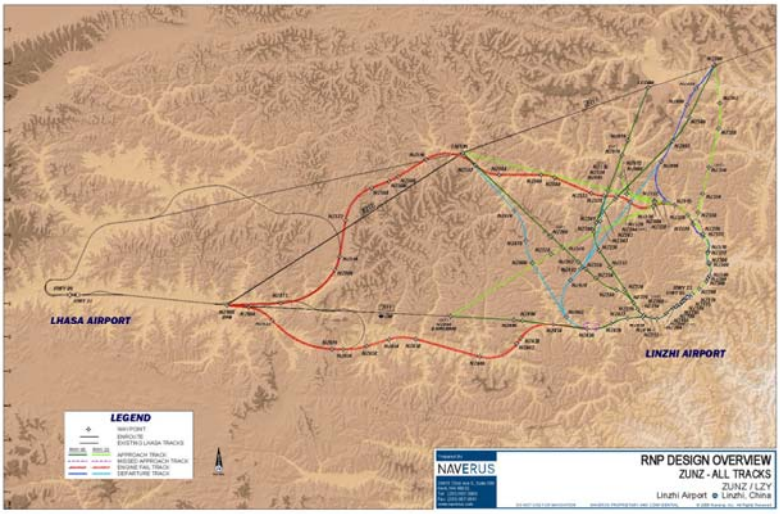
Implementing PBN
"An Operator's View"
Jim Bowman, FedEx

PBN – It's not just RNP



History of FedEx & PBN

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Challenges & One Airline's View

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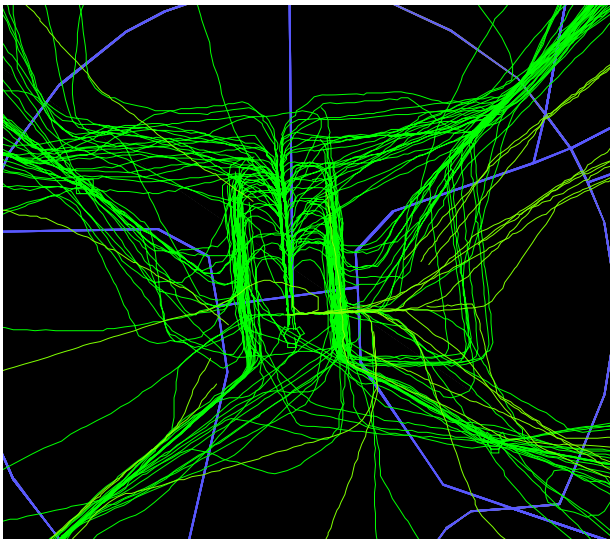
ATC Challenges



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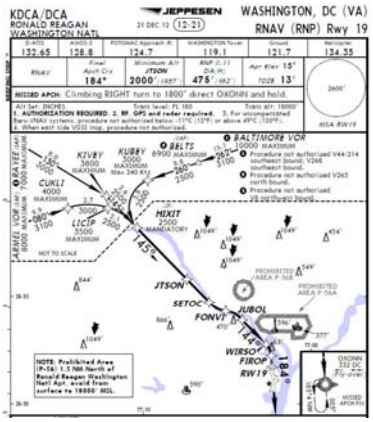
Successes



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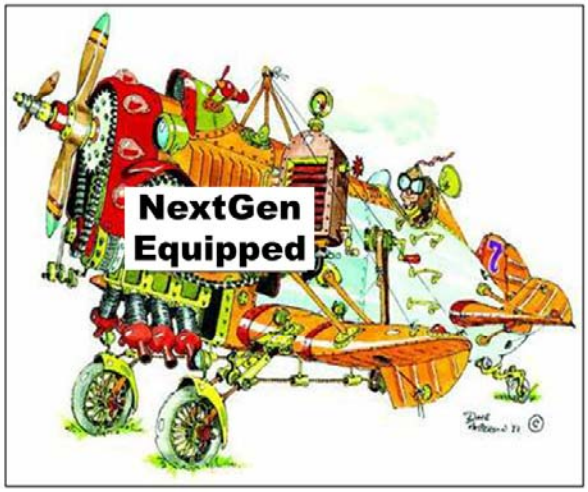
Where should we be headed?



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Group Exercise

Ideal future: PBN-enabled capabilities
OPD, RF legs, RTA, TBFM, ground-based merging/spacing

- Write Press Release – Catchy Title…
  *"On-time **every** time at xxx airport due to NextGen"*
  - Characterize ideal future when fully implemented
  - Describe what is being deployed
  - Highlight measurable benefit public would notice
  - Consider NAC recommended metrics
- Suggestions for community outreach
- Report out

- Full NAC - Discuss gaps and mitigations

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DISCUSSION

Chairman's Closing Comments

NAC Chairman Bill Ayer

Chairman

Alaska Air Group

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Other Business/Anticipated Issues for NAC Consideration and Action

Bill Ayer
Chairman
Alaska Air Group

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Next Meeting

Monday/Tuesday

June 3/4, 2013

Washington, DC

Adjourn

RTCA Paper No. 019-13/NAC-19
February 7, 2013

TERMS OF REFERENCE

NextGen Advisory Committee

Committee Leadership:

Position	Name	Organization	Telephone	Email
Chairman	Bill Ayer	Alaska Air Group	(206) 392-5628	bill.ayer@alaskaair.com
Designated Federal Official	The Honorable Michael Huerta, FAA Administrator	FAA	(202) 267-3111	michael.huerta@faa.gov
Secretary	Andy Cebula	RTCA	(202) 330-0652	acebula@rtca.org

Background: NextGen offers the United States the unprecedented opportunity to increase the safety, predictability and environmental performance of aviation. The FAA seeks to establish an ongoing venue and process to enable stakeholders to advise the FAA on issues related to near- and mid-term implementation by providing a shared vision of NextGen for domestic and international arenas.

Purpose and Scope: The NextGen Advisory Committee will develop a common understanding of NextGen priorities in the context of overall NextGen capabilities and implementation constraints, with an emphasis on the near-term and mid-term (through 2018). The Committee provides a venue where the FAA can solicit a consensus-based set of recommendations on issues that are critical to the successful implementation of NextGen. It is also a forum to obtain a commitment of resources and/or synchronized planning between government and industry that will support and, when necessary, identify opportunities for industry participation in NextGen implementation. In conducting its work, the Committee will foster a common understanding of success with joint performance objectives and development milestones to be reviewed as implementation progresses. The Committee will primarily focus on implementation issues including prioritization criteria at a national level, joint investment priorities, location and timing of capability implementation. The Committee will provide a venue for the FAA as well as industry partners to report on progress on the

implementation of NextGen operational capabilities and associated airspace performance improvements.

The Advisory Committee will include representation from affected user groups, including operators, manufacturers, air traffic management, aviation safety, airports and environmental, from civil and military perspectives, both domestically and internationally.

Tasking:
Within the bounds of the committee's purpose and scope, the FAA will issue specific tasking statements for consideration by the committee. Such tasks will generally reflect an FAA request for aviation community advice and recommendations on a particular operational, implementation, or investment topic. Current year tasks will be listed on the RTCA Committee website.

Envisioned Use of Deliverables: The deliverables of the Committee will document the consensus recommendations of the Committee informed by input from the FAA. These products will facilitate both the FAA and user community procedural planning and investments needed to achieve implementation of components of NextGen and criteria for successful implementation. The FAA will use the deliverables to inform its planning and execution of NextGen.

Representation: The Committee will include members who represent the following stakeholders in alphabetical order:

- Air Traffic Management Automation Providers
- Aircraft Manufacturers
- Airports
- Avionics Manufacturers
- DoD
- Environmental Interest
- Finance
- Labor
- Operators: General Aviation, Air Carriers, Business Aviation
- TSA

FAA (Air Traffic Operations, Aviation Safety, Airports, and Policy and Environment), MITRE and RTCA are non-voting members of the committee. They will take part in the committee's deliberations and provide input to final products; however, they do not represent affected user groups in reaching consensus.

Committee Characteristics: In addition to representing the aviation community segments described above, the NAC will have the following characteristics:

- Executive level membership who can speak for and commit their organizations

- Flexibility to reach out to necessary segments of the aviation community to answer specific requests from the FAA

- Leanness and efficiency, with membership not to exceed a reasonable number, to enable the Committee to have substantive dialog and reach timely consensus

- Appropriate expertise to include operations, policy, technology, labor relations, training and finance

Structure of the Committee (Attachment 1): The NextGen Advisory Committee will conduct its' deliberation on recommendations to be provided to the FAA in meetings that are open to the public. To meet the criteria described above, the Committee structure will be two-tiered with subordinate Work Groups established to develop recommendations and other documents for the Committee.

At the top level is the NextGen Advisory Committee comprised of top-level executives representing affected members of the community. Adjunct to the Advisory Committee is a Subcommittee (NAC Subcommittee) comprised of members with broad knowledge and expertise related to the implementation of NextGen. Some meetings of the NACSC will be open to the public to provide an early opportunity to identify potential concerns associated with draft recommendations.

In an effort to maintain an appropriate and manageable size, the number of NACSC members will be limited. The NACSC will utilize a rotating membership that will maximize the opportunity of participation among interested organizations. Interested parties should make their interest in serving on the Subcommittee known to the Designated Federal Official, the Chairman of NAC and the RTCA President.

The Advisory Committee may establish Work Groups (WG) and/or Task Groups (TG) to accomplish specific tasks as described above. WG products—including recommendations, where appropriate—are presented to the NACSC for review and deliberation, then forwarded to the Advisory Committee. Members of Work Groups and Task Groups will be appointed by the NACSC Co-Chairs in consultation with the RTCA President and NAC Chairman and DFO. Work Groups and Task Groups may not be open to the public. For each work group that is established, the Advisory Committee will approve Terms of Reference defining the objective, scope, membership, specific tasks and deliverables with a schedule. Unlike the Advisory Committee and NACSC, members of the Work Groups and Task Groups do not represent a particular affected entity and are selected for their expertise in the subject matter rather than their affiliation. Work Groups develop draft recommendations for consideration by the Subcommittee. Work Groups and Task Groups will disband upon delivery of their recommendations as appropriate.

- **NextGen Advisory Committee**
    - Overall direction of Committee
    - Review and approve recommendations to FAA

  - Field requests from FAA
  - Review and approve creation of Work Groups, as appropriate
  - Meet three times per year in Plenary (open to public)
  - Direct work of NACSC

- **NAC Subcommittee**
  - Staff to Advisory Committee
  - Guide and review work of WGs and TGs, present findings to NAC
  - Meet bi-monthly or as needed (not all open to public)
  - Forward recommendations and other deliverables to NAC for consideration

- **NAC Work Groups and Task Groups**
  - Created to address specific tasking
  - May be short-term or standing activities

Operating Norms: Advisory Committee members are appointed for a two-year term. Committee members may serve multiple terms. After the initial appointments, these will be made by the RTCA Policy Board in coordination with FAA. The RTCA President, FAA Air Traffic Organization Chief Operating Officer, and the Associate Administrator for Aviation Safety will review NextGen Advisory Committee membership yearly to ensure balanced representation that equitably represents, to the extent feasible, the aviation community. Membership is based on the ability to authoritatively and effectively represent the interests of an organization or constituency. Members will be expected to work toward consensus to the greatest extent possible.

The Advisory Committee will hold at least three plenary meetings per year (open to the public), as well as preparatory one-hour telecons (not open to the public) to ensure continuity and good preparation for public, decision-making meetings.

The NACSC will, at a minimum, meet every other month, with some of the meetings open to the public. All recommendations of the NACSC must be vetted through the Advisory Committee and forwarded to the FAA as appropriate. Recommendations will not be transmitted directly from the NACSC to the FAA.

Work Groups and Task Groups will meet as dictated by their Terms of Reference. As appropriate, Work Groups or Task Groups can reach out to individual experts and other outside groups providing advice to the FAA on NextGen implementation issues to facilitate the development of draft recommendations. Work Group and Task Group meetings are not open to the public.

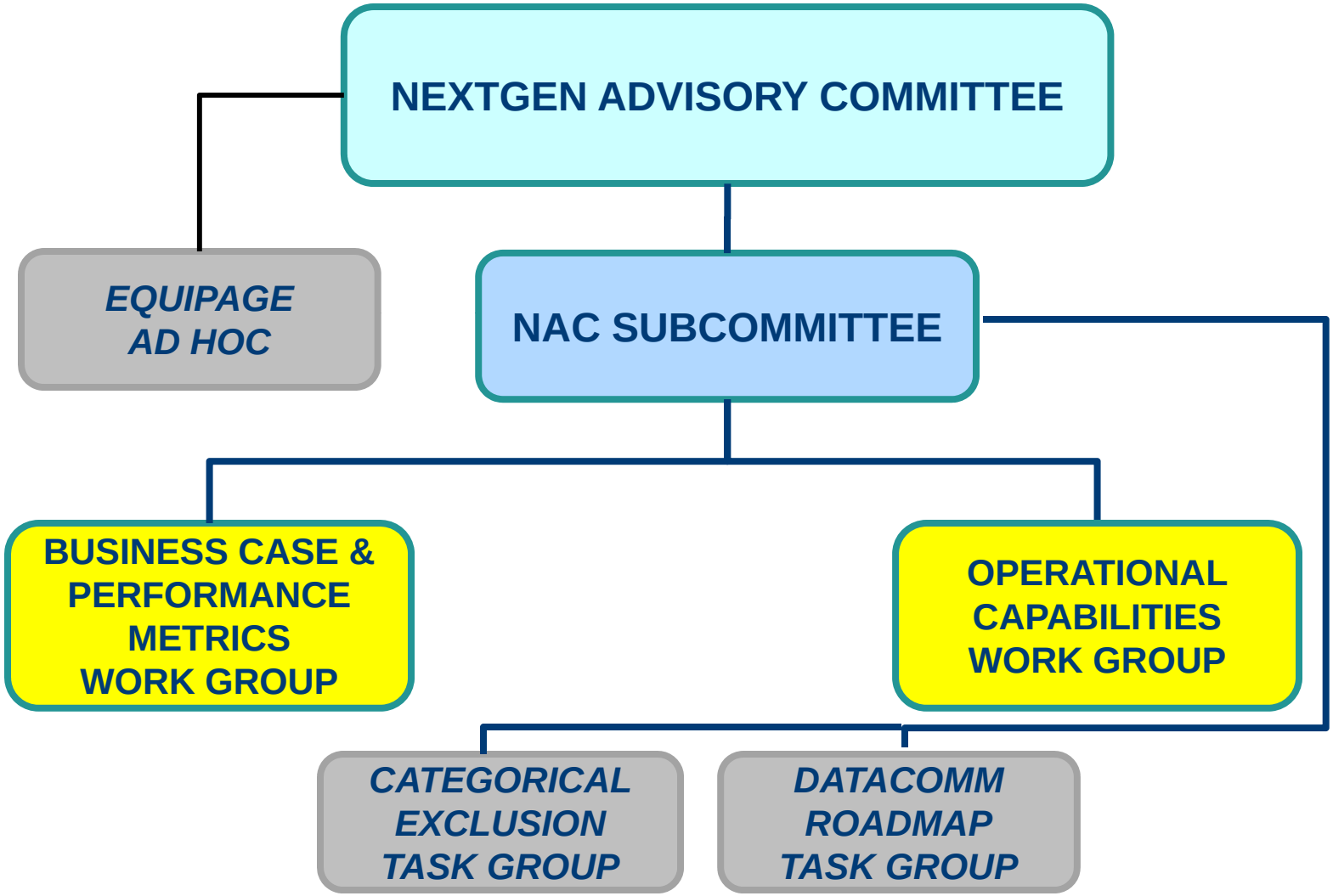
Standard Advisory Committee Meeting Agenda: Proposed agenda items with approximate duration are to be submitted to the chair at least 45 days prior to the scheduled date of a meeting. The Chair, in consultation with the DFO, shall refine the scheduled duration of the meeting and promulgate the meeting agenda to the Committee members.

Conduct of the Meeting: Advisory Committee members will receive all information needed to prepare for the meeting (e.g., Work Group progress reports; Work Group products and recommendations for Committee action) at least fifteen (15) calendar days prior to the meeting.

With the exception of routine administrative items, discussions of agenda items shall, in general, be supported by written reports or formal briefing material as appropriate.

Products and recommendations submitted for Advisory Committee action will be accompanied by a one-page Action Paper prepared by the NACSC.

NAC Structure



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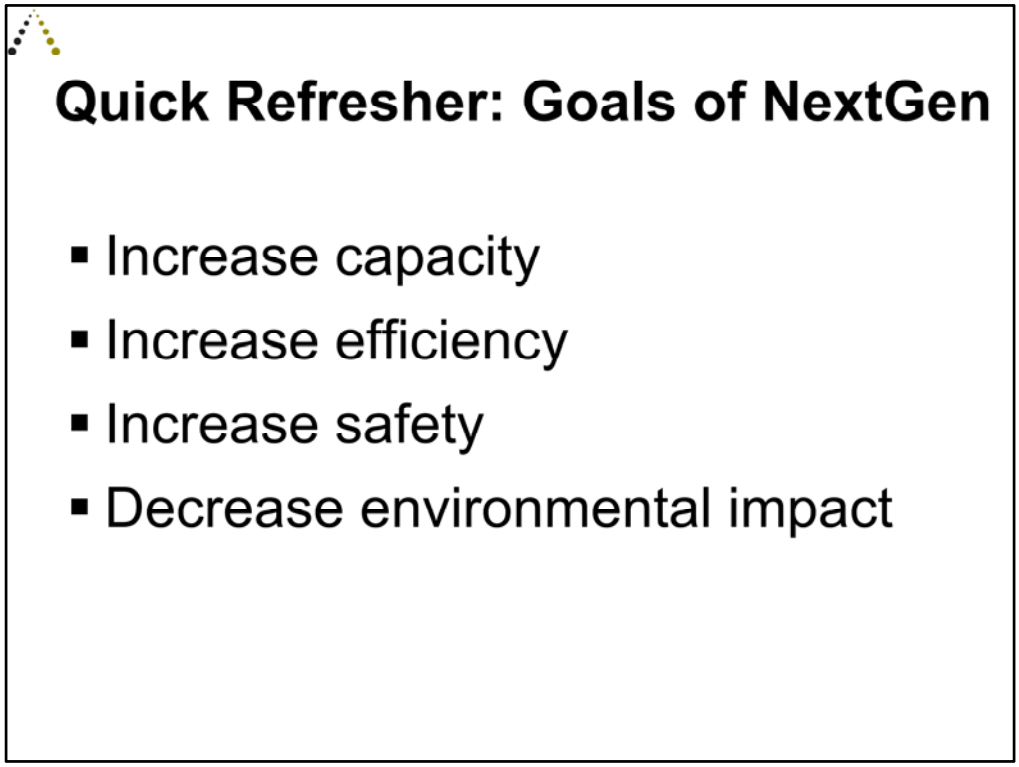
Chairman's Report

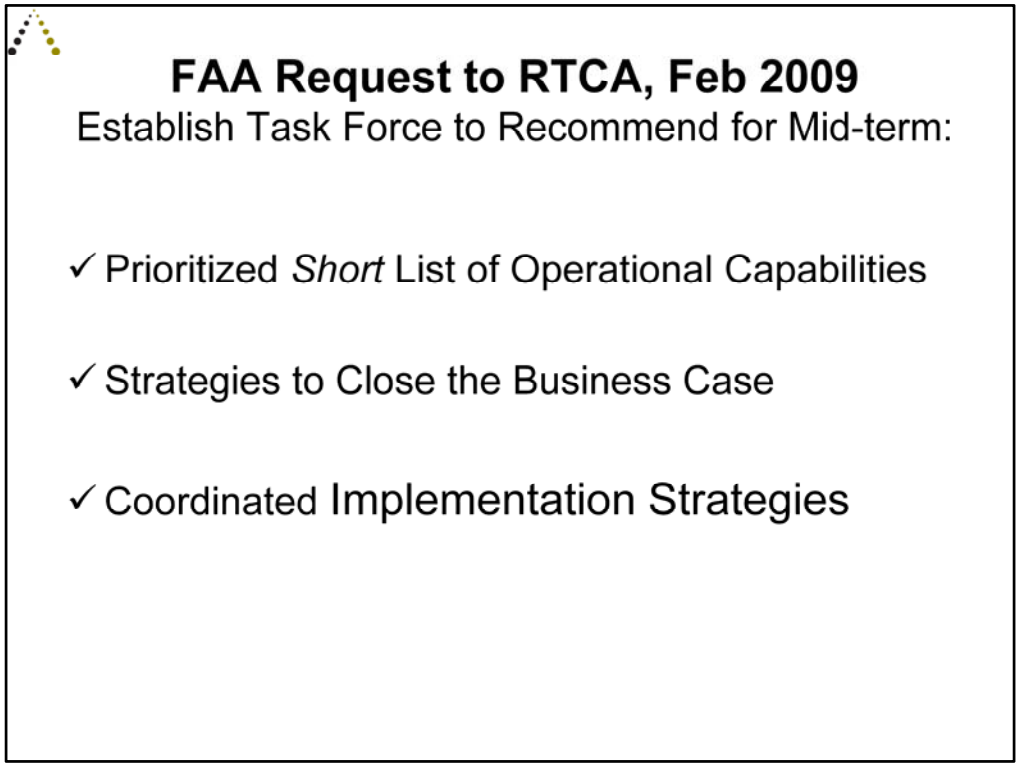
NAC Chairman Bill Ayer

Chairman

Alaska Air Group



Soon after the turn of the century, the FAA embarked on the endeavor to transform the National Airspace System to keep pace with the demand which is increasing in size, complexity and diversity.
The goals of NextGen are:
- Increased capacity
- Increased efficiency
- Increased safety
- Decreased environmental impact

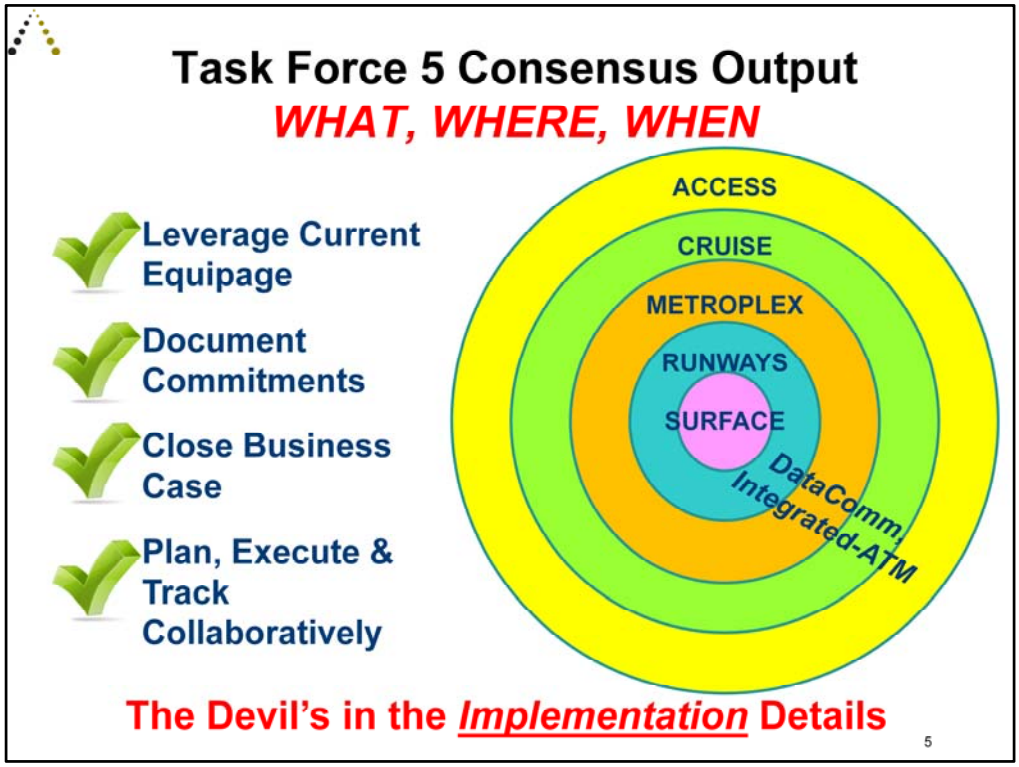


In 2008, not long after the publication of the JPDO NextGen Concept of Operations, the FAA turned its attention from the "WHAT" to the "HOW" of art traffic management system modernization. Realizing the extent to which NextGen would require an unprecedented level of industry investment and changes to how air traffic services would be delivers, the FAA asked RTCA to establish a Task Force to forge a government/industry consensus on the path to NextGen, and, in particular, what should be deployed and operational by 2018. Specifically, the FAA asked for 3 outputs:

✓A Prioritized *Short* List of Operational Capabilities

✓Strategies to Close the Business Case where investments will be required

✓Coordinated Implementation Strategies



Over 335 individuals from 141 organizations worked to forge consensus on mid-term NextGen. Recognizing the fact that NextGen will require substantial investments on the part of not only the government, but also the operators and industry, the members of the Task Force determined that the near- and mid-term capabilities must deliver benefits that allow the operators to close the business case for investment. TF5 output is characterized by several unique aspects.

First, they defined the WHO, WHAT, WHERE AND WHEN of each recommended capability. No capability even made it the list for consideration that did not have commitment from at least one operator to invest if the FAA deployed the capability by dates certain.

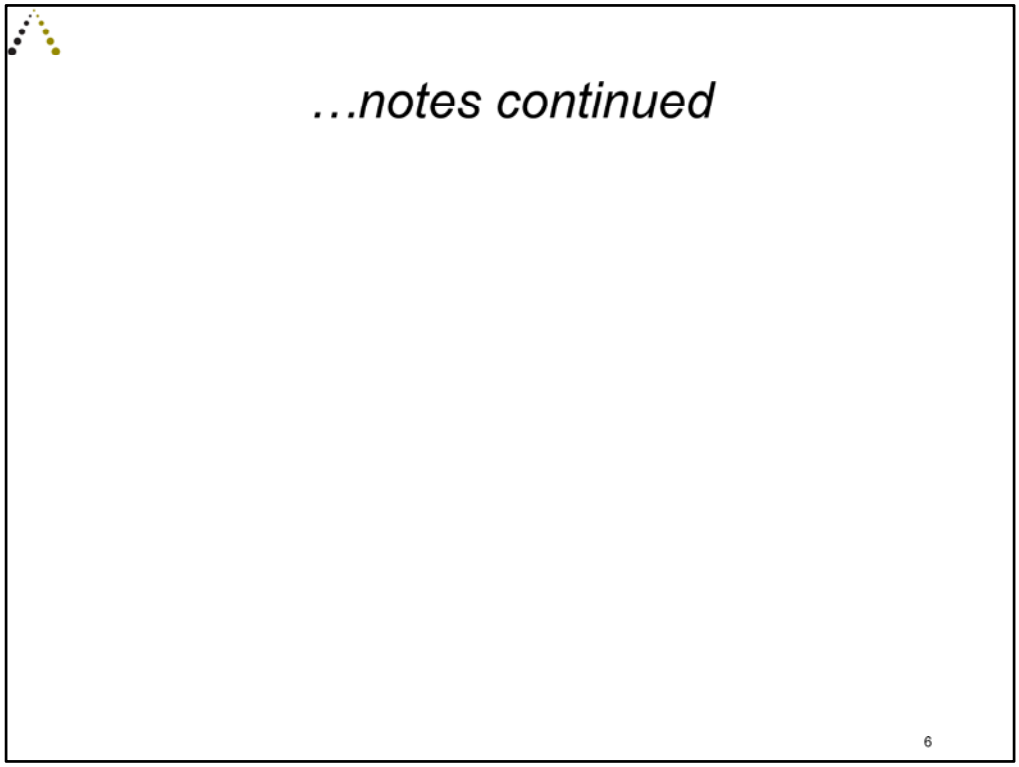
Second, The Task Force stressed the importance of implementing operational capabilities verses technologies, and deriving benefits from existing equipage.

Third,by delivering benefits in the near-term leveraging existing equipment, the FAA instills confidence that it will be able to deliver benefits for the next phase of NextGen and in so doing, helps the operators close the business case for equipage.

Fourth, the best approach to deployment is a Metroplex approach, delivering capabilities where most needed.

Finally, TF5 strongly recommended a follow-on mechanism for continued FAA-industry collaboration on NextGen implementation, where FAA and all NextGen stakeholders would plan, execute and track NextGen, holding all accountable to commitments, and tracking progress.

TF5 recognized that the easy part if the **PLAN**. The hard part is **IMPLEMENTATION**



Recommendations::

•SURFACE

- Reduce delays, enhance safety, efficiency & situational awareness
- Capture & disseminate surface operations data to pilots, controllers, ramp towers & FOCs
- Establish one consolidated point of responsibility, authority and accountability within the FAA,
- ..In accordance with a govt/industry coordinated execution plan

•RUNWAY

- **Leveraging capacity gains achievable through accurate and predictable flight paths,**
- **Using enhanced surveillance methods.**
- **Foundational activities based on existing capabilities**
- **Leading to a determination of needed additional investment.**

•METROPLEX

- Instituting tiger teams to focus on quality of implementation at each location and de-conflicting of adjacent airports.
- RNAV, with RNP where needed (e.g., for RF)
- Optimized vertical profiles using vertical navigation
- Use 3 NM and terminal separation rules in more airspace
- Integrate approach to airspace design and classification
- ATC, flow and surface traffic management tools.

•CRUISE

- Increasing the ability to disseminate real-time airspace status and schedules (particularly with respect to Special Activity Airspace)
- Improving flow management to better utilize time-based metering and flight operator capabilities
- Implementing data communications between ATC systems and aircraft to more effectively manage traffic and exchange routing and clearance information.

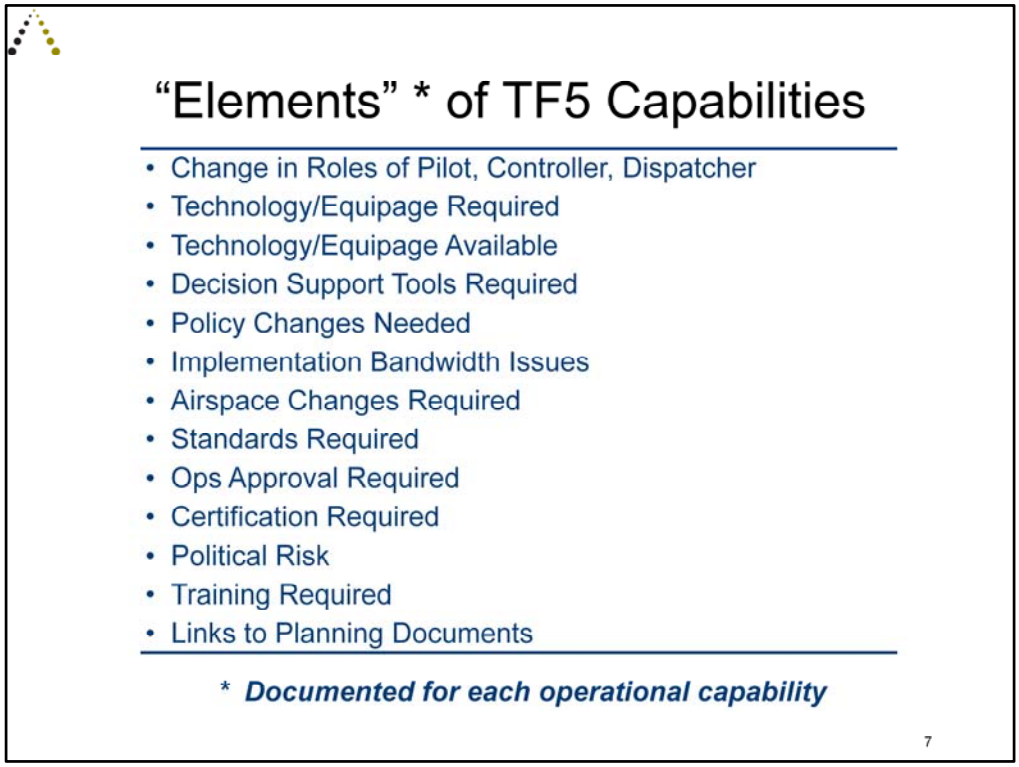
•ACCESS

- Implementing more precision-based approaches and departures,
- Expansion of surveillance services to areas not currently under radar surveillance.

•CROSS-CUTTING-DATA COMM

- Improve cruise and transition operations by using data communications to enable more efficient use of available or forecast capacity in the NAS.
- Increase the ability to better adapt to changing conditions through improved dissemination of tactical reroutes around weather forecast and congestion

- **CROSS CUTTIN I-ATM**
  - Create an Integrated Air Traffic Management System that leverages new technologies and collaboration with the users
  - Implements solutions to traffic flow problems that are effectively integrated across time and air traffic control domains, to achieve the efficiency goals of the service provider and the users.

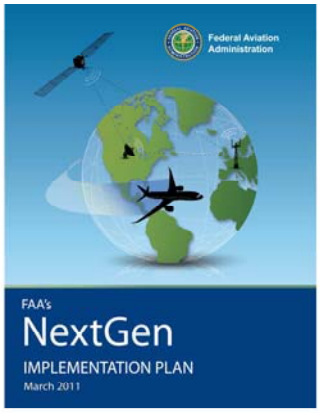


Task Force 5 did not stop at recommending operational capabilities to be deployed by 2018. The many experts who populated the Task Force recognized that to deliver the benefits of any operational capability that improves system performance, the FAA must accomplish a host of related initiatives. For any given NextGen capability, requisite changes must be understood and achieved, including:

- Training for changes in roles of pilot, controller, dispatcher
- New Technology or equipage fully deployed (e.g., ADS-B, , DataComm radios)
- Technology or equipage available today in the market place
- Decision support tools running on top of new technologies for controllers, pilots, dispatchers (e.g., aircraft rerouting tool for controller, aircraft equipage indicator for controllers)
- New policies (for example rules to enable those who equip to receive benefits, moving beyond first-come-first-served)
- Implementation bandwidth issues resolved
- Airspace changes completed
- New technical performance standards issued
- Operations approval process streamlined
- Certification process streamlined
- Effective training programs in place
- Environmental and noise issues resolved

FAA Incorporates TF5 Recommendations into Plans

- FAA worked with TF Leadership to understand recommendations and transparently integrate into The NextGen Implementation Plan
- FAA established NAC to continue collaboration on implementation
  - Requested Top- Level executives
  - Commitment to consensus
  - Focus on tough policy and implementation issues



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During late 2009 and 2010, the FAA worked with the leaders of Task Force 5 to understand the recommendations, and provide transparency in how they addressed each recommendation. Their response if codified in their NextGen Implementation Plan, which is updated annually.

In May 2010, the FAA asked RTCA to establish a new committee for reaching industry consensus on NextGen by requesting that RTCA bring to a close the work of the ATMAC and create a new executive level federal advisory committee. The FAA requested that this committee be relatively small in size, with participants who are executives who can commit their respective organizations to the committee's consensus, and whose representation goes beyond air traffic management to include safety, environment, policy and airports. In response, RTCA has formed the NextGen Advisory Committee (NAC) to focus on the near and mid-term modernization of the aviation system.

The NAC is all about the "business of NextGen", focusing on the policies, operational challenges, performance metrics and other key challenges to delivering the full benefits of NextGen.

Since its first meeting in the Fall fo 2010, The NAC has devliered 19 recommendations, all in response to requests from the FAA and all aimed at facilitating the successful IMPLEMENTATION of NextGen. Areas the NAC has tackled and reach consensus include:

- Best-Capable, Best-Served
- Financial Equipage Incentives
- Prioritized Deployment Locations
- NAS Performance Metrics
- Environmental Review Process
- Trajectory Operations
- DataComm

In preparation for today's meeting, I asked RTCA to run some of the foundational NextGen-related RTCA has produced through the "*wordle"* program, to see if certain words and themes emerged. Andy ran the Task Force 5 Report, along with several key NAC reports, including the Trajectory Operations, and Equipage Report through the program and produced the output you see on this chart.

The program creates a graphic showing the words that are most used in a document. Not surprisingly, we find the themes that have been at the core of our important consensus since Task Force 5:

Investment – more that any preceding modernization effort, NextGen will require substantial investment on the part of the operators.

Business Case – Since NextGen requires unprecedented investments on the part of not only the FAA, but the operators and industry, their must be a positive business case for that investment

Benefits – Task Force 5 made it clear that to encourage equipage, operators muse realize benefits within a reasonable period of time.

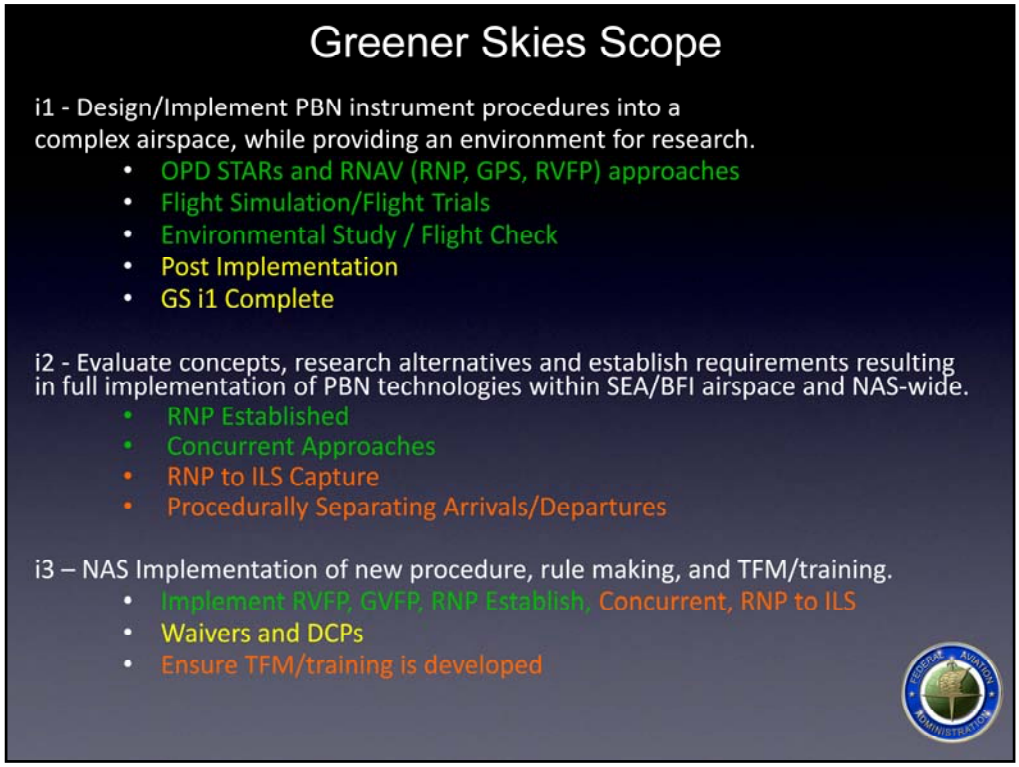
Commitment - A key part of closing that business case is confidence that the FAA will deploy NextGen capabilities when and where promised, and that all stakeholders will adhere to commitments.

Metrics – We all know that you cannot improve what you cannot measure. Much of the work of the FAA and its NextGen stakeholders has revolved around defining the appropriate metrics against which we can collectively and transparently measure success

Efficiency – NextGen is about improving the efficiency of the Air Traffic Management System

Capabilities – NextGen is about more than technologies. Policies and procedures must also be implemented along with requisite training and other components required to deliver the full benefits of NextGen

Transition – NextGen is not an end state, it is a journey, with increasing capabilities delivering benefits along the way.



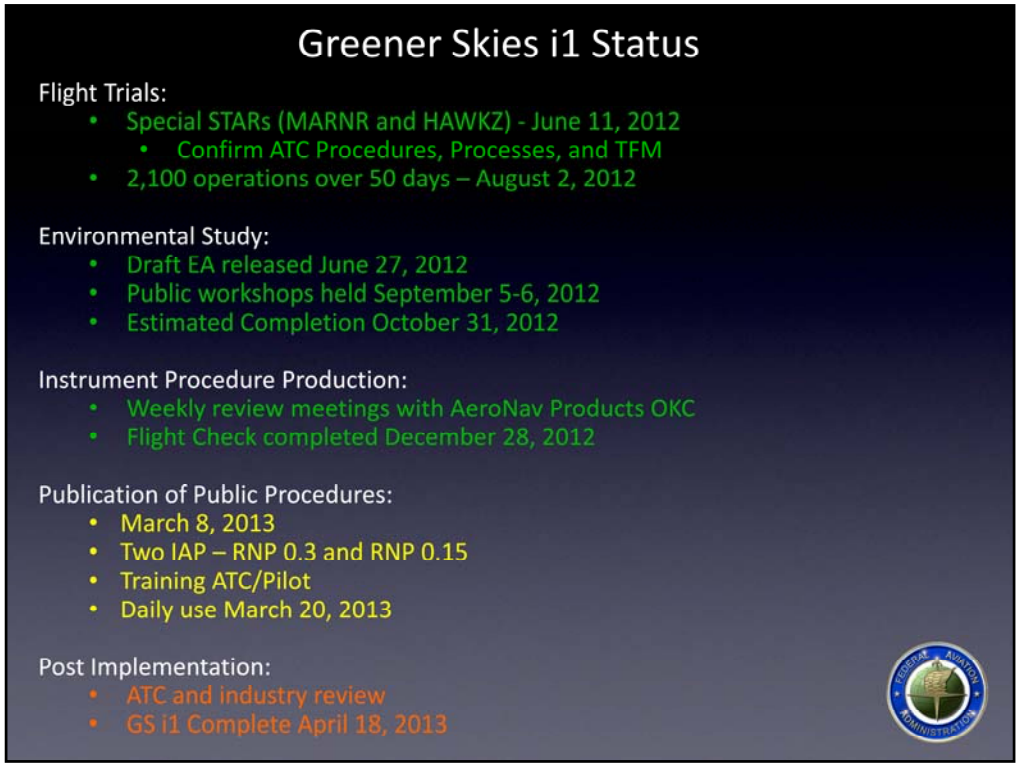
Greener Skies i1 has designed flight procedures including two OPD STARS with RNAV transitions to the existing ILS/GPS/RNAV straight-in procedures with additional transitions to RNP AR (Authorization Required) 0.3 curved approaches to every runway end.

In the near future, SPECIAL RNP AR .15 procedures have been designed to 16R/34L for the purposes of RNP Established.

i2 has studied and assessed the RNP Established (SEA Parallel Runways) concept and an SRM (Safety Risk Management) panel has met. A waiver for KSEA has been submitted for approval. This would allow for a straight-in approach to the inboard runway with an aircraft established on a curved path for the outboard runway.

Concurrent approaches (SEA-BFI) is being studied at this time. This would allow for a VNAV curved approach for SEA over an approach to BFI.

i3 is charged with NAS implementation using the lessons learned from Greener Skies.

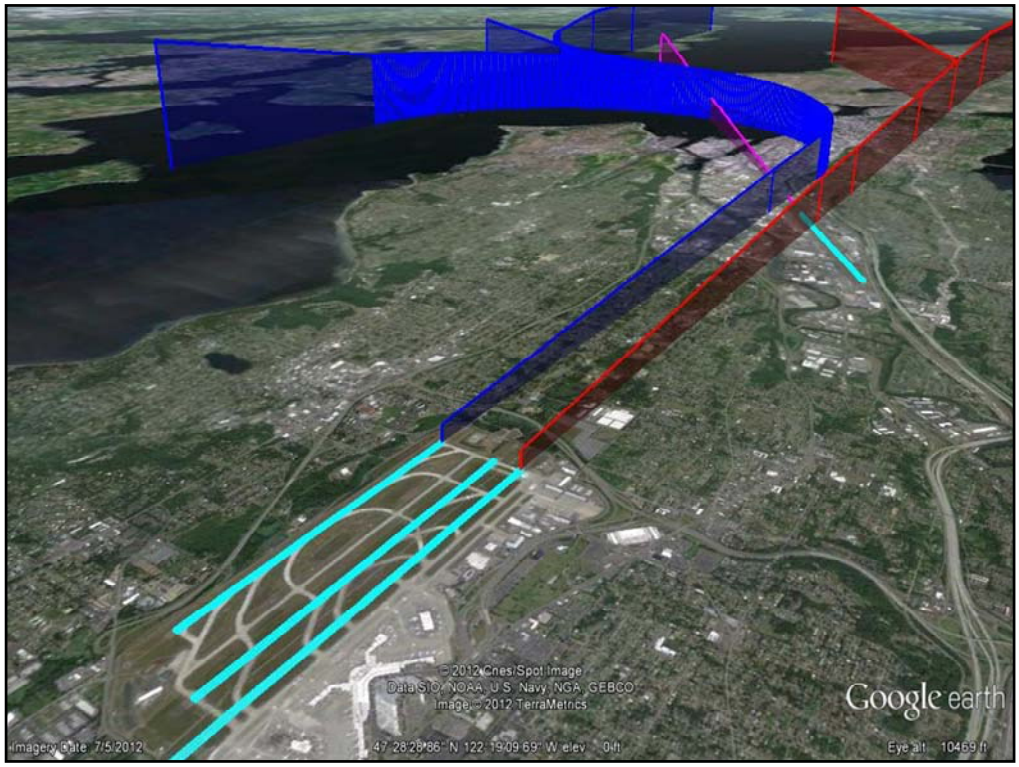


Flight Trials Jun-Aug 2012 to confirm ATC procedures, processes and Traffic Flow Management
2100 flights in 50 plus days
Lessons learned on the flights were incorporated into the procedures due to be published this March.

The Environmental Study was completed early November, 2012

The flight check of the new procedures was completed on December 28. 2012

The new procedures will be published on March 8 but will remain unused until later, March 20th to allow for proper and complete dissemination and training.



RNP Established / Concurrent Operations / RNP-ILS graphically

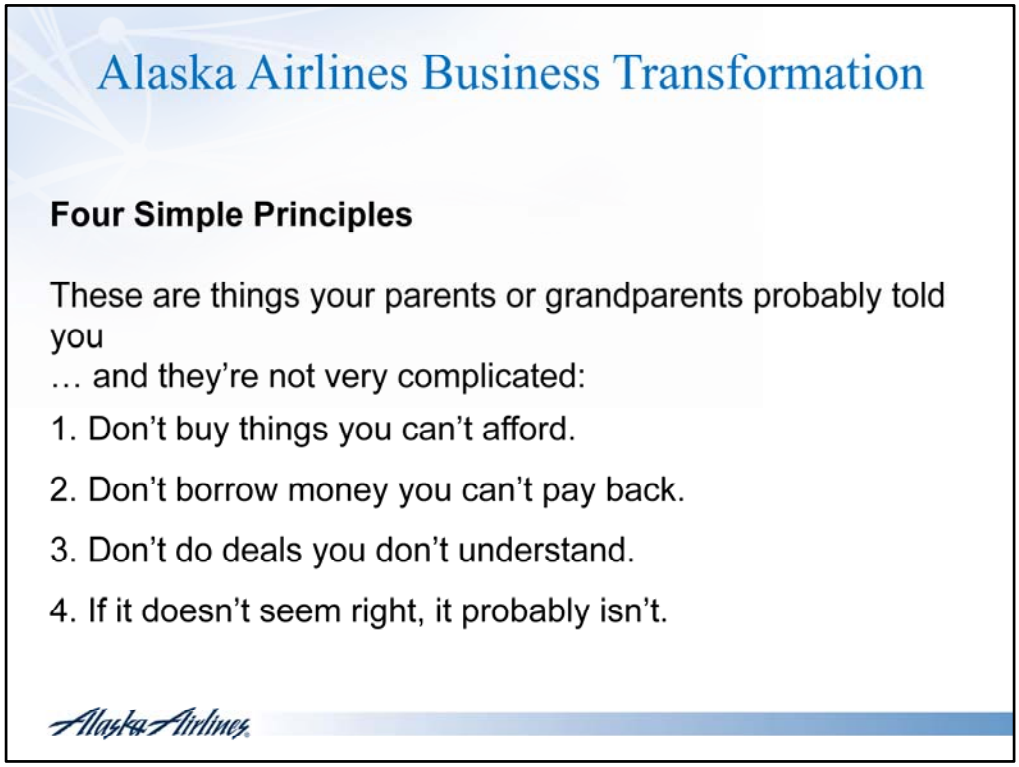
<u>ULTIMATE GOAL:</u>
RNAV transition to the ILS on 16L
RNP to ILS CAT III on 16R over the KBFI approach

At the same time

Alaska Airlines Business Transformation

Lessons Learned

- Get the right people on the bus.
- Create a sense of urgency.
- Work on only one or two big ideas at a time.
- What you measure gets done.
- Focus on what you can control over the long-term.
- Be totally and completely customer focused.
- Don't confuse being popular with doing the right thing, at least in the short-term.
- Develop strategic partnerships.


Alaska Airlines Business Transformation
Four Simple Principles
These are things your parents or grandparents probably told you
… and they're not very complicated:
1. Don't buy things you can't afford.
2. Don't borrow money you can't pay back.
3. Don't do deals you don't understand.
4. If it doesn't seem right, it probably isn't.
Alaska Airlines

FINAL **02/06/2013 5:00 PM**

Michael Huerta
NextGen Advisory Committee
Salt Lake City
February 7, 2013

Thanks for that introduction. It's great to be here with all of you. I have a special place in my heart for Salt Lake City and for Utah going back to my days on the organizing committee of the winter Olympics.

Today we have students and faculty visiting from Utah Valley University.

These students are studying Aviation Administration and are here to observe how industry and the federal government discuss the issues involving NextGen – the Next Generation Air Transportation system. Welcome to all of you. I am glad that you are interested in NextGen. Today you will get some insight into the challenges that you will face as aviation professionals.

As you saw at the tour of the en route center yesterday, Salt Lake City and its controllers have played an important role in testing, refining and using ERAM – that's En Route Automation Modernization.

ERAM is one of the foundations of NextGen. It's the new backbone of the air traffic control surveillance system, and it's now operational at nearly half of the en route centers in the nation. This is a big improvement over where we were four years ago.

We are making progress in realizing the benefits of NextGen now. Another place we are really seeing progress is Seattle. And one of the airlines that has embraced satellite navigation from the early days is Alaska Airlines. That kind of commitment is due to strong leadership and vision.

I want to welcome Bill Ayer as the new chairman of the NAC. And I want to thank him for his dedication and hard work to make Greener Skies Over Seattle a reality.

Next month, we will start using new satellite-based procedures into SeaTac that will save fuel, cut track miles and reduce noise and greenhouse gas emissions. Ninety-five percent of all airlines that fly into Seattle will be able to use these new procedures.

The work we're doing with satellite-based navigation in Seattle will provide a template for how to roll out these benefits at airports across the country.

So thank you, again, Bill, for your leadership and support.

FAA/DOT Personnel Updates

As you all know, Secretary LaHood has announced that he is leaving his Cabinet position. He said it's the best job he's ever had. We have made significant progress at the DOT under his leadership in reducing distracted driving, providing pilots the opportunity for the rest they need, and reducing roadway fatalities to historic lows. He'll stay on until the Administration names a replacement to assure a smooth transition.

We're also going to miss Vicki Cox. Vicki led the way in moving NextGen from concept to reality.

She figured out a way to pay for it, assembled a team that could make it happen, and made sure new technologies and procedures would blend safely with the existing system. She had to build a road map, and the roads too.

Now Pam Whitley has taken up the reins as Acting Assistant Administrator for NextGen. She is continuing down the path that she helped to set in motion as Vicki's right-hand. Pam joined the FAA in 1993 and has been involved in NextGen from the start. She sees the big picture and knows how all of the pieces fit together. I appreciate that she's agreed to step up and take on the challenge.

Still on the to-do list is naming a new Deputy Administrator for the FAA, who will act as the agency's champion for NextGen. We are working on that. In a change from previous years, this position will not need Senate confirmation so we're optimistic the process will be smooth. We hope to have more information on that – and hopefully even an introduction – at our next meeting.

Boeing 787

The FAA's number one priority is the safety of the traveling public. So, before I go any further, I want to address recent developments with the Boeing 787 aircraft.

As I've said before, I have confidence in Boeing's ability to create a safe aircraft. At the FAA, our job is to make sure every aspect of an aircraft meets the highest possible safety standards.

We need to get to the bottom of the recent issues with the batteries in the 787 and ensure their safety before these aircraft can be put back into service.

We are working diligently with Boeing to figure out the problem and to find a solution. Our goal is to get this done as quickly as possible, but we must be confident that the problems are corrected before we can move forward.

Budget/Sequestration

As you know, we are hopeful that Congress will reach a solution and avoid sequestration. As it stands right now, the budget cuts are scheduled to happen on March 1st.

As you may recall, on New Year's Eve, Congress reached an agreement on the taxation portion of the fiscal cliff. In addition, they postponed sequestration for 60 days in order to give the new Congress time to act. The original estimate of an 8.2 percent across-the-board cut has been reduced now to a 5 percent across-the-board cut for FAA. That is because part of the New Year's Eve deal included a $24 billion package that cuts spending and raises revenues. Still, we would have less time to make the sequestration cuts because fiscal year 2013 will be nearly half over by March 1st.

We anticipate that the Office of Management and Budget would implement sequestration across the board. This would require the FAA to make the cuts equally across all budget line items in the affected accounts. This

significantly minimizes the flexibility we would have in managing the budget reductions.

Sequestration would force the FAA to cut back on operating costs by reducing the core services we provide.

We anticipate that in the upcoming weeks the newly seated 113th Congress will address the remaining components of the fiscal cliff. Congress would need to pass an alternative debt reduction strategy that would eliminate the need for the sequestration. Congress did tackle one important item already, by agreeing to raise the federal government's debt ceiling so that our country will not default on its debts.

Apart from possible sequestration, the FAA does not have a budget for fiscal year 2013. Congress passed a continuing resolution which keeps the government running until March 27 at a rate equal to last year's budget. After March 27, we will need an approved budget or another continuing resolution to keep operating.

If Congress keeps our spending level the same through the end of fiscal year 2013 it would be enough to maintain the FAA's basic operations with minimal impacts.

The release of the 2014 budget has been delayed because of uncertainty over sequestration and the fiscal cliff. We are continuing to work with the Office of Management and Budget to develop this budget.

Also, on January 29 President Obama signed the $50 billion aid package for areas hit by Superstorm Sandy. The bill includes $30 million for the FAA to make needed repairs to air traffic control systems and facilities damaged in the storm.

This includes damage to five air traffic control towers such as Philadelphia and Richmond, and the Boston Air Route Traffic Control Center.

The funding also allows FAA to fix 23 navigation and lighting systems across New York and Connecticut, including those at LaGuardia and Kennedy airports.

Update on DataComm

We have made significant progress on DataComm. This is a capability that has been on the drawing board for a

long time – for years – and I am proud to say that the FAA has committed to DataComm as the way of the future. The full benefits of NextGen – increased efficiency and safety, the ability to make complicated re-routes in mid-flight, the reduction in wait times to take off – all of these rely on the capabilities of DataComm. The FAA formally decided last May to adopt this program and to make it part of the way we operate.

And last September, we awarded a contract to integrate DataComm into the many parts and pieces of our airspace system – I'm talking about ground automation, telecommunications, security firewalls, air-ground network services and aircraft avionics. It all has to be integrated to work together.

The big picture is that we are moving forward with DataComm in towers at 41 major airports starting the roll out in 2016. A few years later, we plan to start the roll out at en route centers that cover the entire country.

More immediately – just last month, we started DataComm trials in Memphis. We have been testing the departure clearances that controllers issue from the tower to

pilots ready to takeoff. We'll continue testing for the next year.

The FAA and FedEx made history January 17 when a FedEx MD-11 received a departure clearance to fly from Memphis to Miami using written instructions from the air traffic controller rather than a clearance spoken over the radio.

At 3:09 pm that day, the FAA controller pressed "CLEARED AS FILED," letting the FedEx plane know it was cleared.

The pilot "WILCO'd" in writing, and thus a small, but significant step was taken to providing Data Comm to our airspace system.

Flight crews and controllers reported the system performed as expected.

We'll expand these trials in coming months to include more FedEx flights.

We'll also expand the Data Comm trials to Newark starting in April, working with United Airlines and others. Again, we'll test the departure clearances with a limited number of airplanes at first, then move on to passenger

flights as the trial progresses over the course of the coming year.

Now, while we are working more immediately on departure clearances from the towers, we intend to use DataComm when controlling high altitude traffic as well.

And we're making progress. We have a team of experts from different lines of business inside the FAA – everyone who needs to be onboard to implement our plan for DataComm in the en route environment. We have created this new process to ensure that DataComm moves forward inside the FAA in a way that's coordinated and expedited.

A year ago, you gave us recommendations for how to move forward with DataComm and we heard you. We're acting on it. The recommendations are not sitting on a shelf gathering dust. This team of experts from across the agency is analyzing and debating those recommendations in an orderly manner.

Other Relevant NextGen News

We are on track to publish the 2013 update to the NextGen Implementation Plan next month. This year, we'll publish it electronically: as an e-book and as a downloadable PDF.

We're trying to reduce printing costs and save trees. Plus, the electronic version includes links to supplemental info on the FAA website.

We will still print a brochure of the plan with the executive summary. And we'll also print the Appendix A tables.

Turn the floor over to David Grizzle.

David Grizzle will now update you on our response to the Metrics Report that we received from you last fall. Nancy Kalinowski will then brief you on the FAA's effort to develop a list of Harmonized Metrics.

David will deliver his remarks (2-3 minutes).

David will then introduce Nancy Kalinowski, who will do a briefing about the FAA's Harmonized Metrics.

After Nancy Kalinowski is finished, you will introduce the next topic:

Briefing on NextGen Optimized Profile Descents in metro Washington, D.C.

Lynn Ray and David Surridge (US Airways) will now provide a briefing on the new NextGen arrival routings we have been using in the Washington D.C. metro area since last August.

We used a very collaborative process to create these fuel-saving arrivals. And we're seeing benefits already.

Lynn and David will make their presentation. And that ends the program.

End of Report.

Approved by the NextGen Advisory Committee February 2013

Recommendation for Key City Pairs for Measuring NextGen Performance

A Report of the NextGen Advisory Committee in Response to Tasking from The Federal Aviation Administration

February 2013

Recommendation for Key City-Pairs

Introduction/ Background

In October 2010, the FAA asked the NAC to develop recommendations for outcome-based performance metrics that will show how NextGen implementation impacts the performance of the National Airspace System. As part of this task, the NAC was expected to provide input on the related methodologies. The NAC's recommendations have been accepted by the FAA and served as input for the NextGen Performance Snapshots web site and overall FAA work on performance metrics.

Section 214, Performance Metrics from the FAA Modernization and Reform Act of 2012 (Public Law 112-95) calls for the FAA to begin tracking and reporting performance against a set of metrics, including three that are to be measured among "key city pairs":

- fuel burned between key city pairs
- the average distance flown between key city pairs
- flown versus filed flight times for key city pairs

In August, 2012, to assist some immediate FAA work, the FAA requested that the NAC leverage discussions already taking place to provide recommendations on the set of key city pairs that could be used for NextGen metrics. Building on the work of the Business Case and Performance Metrics Work Group (BCPMWG) to develop metrics for determining NextGen implementation, a Task Group was created to expedite the development of recommendations on the set of key city pairs that could be used for NextGen metrics. The Task Group included the Co-chairs from the Airspace and Procedures Work Group (APWG), Integrated Capabilities Work Group (ICWG), BCPMWG and the NAC Subcommittee (see Appendix A for list of participants).

In October 2012, twenty-four city pairs were identified as an initial recommendation to the NAC. Based on feedback from the NAC, this document reflects NAC guidance to address transcontinental operations. The NAC also requested that the city pairs adequately reflect regional operations; evaluation of the twenty four city pairs verified that there are significant percentages of regional operations included in the list of the city pairs.

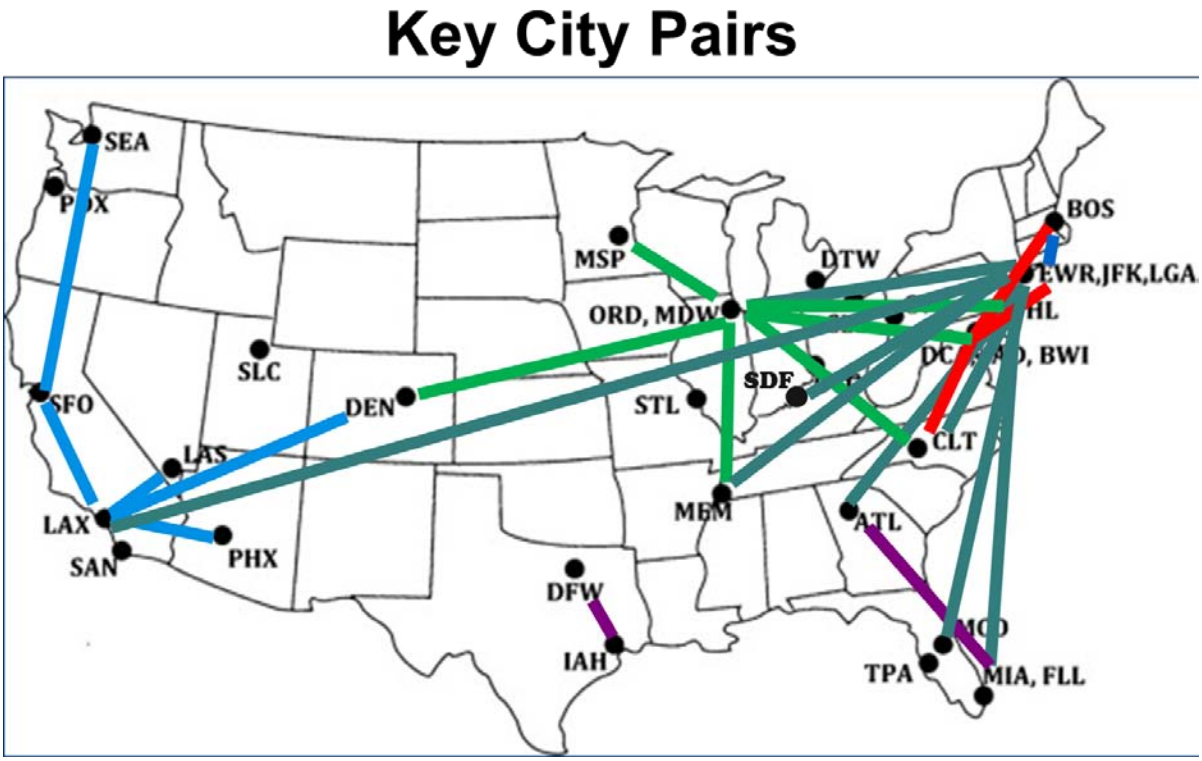
Executive Summary

Using an analytical process supported by quantitative criteria and qualitative analysis by Subject Matter Experts, the Task Group developed a list of 25 city pairs that serve as the initial group for the FAA to use in measuring the impacts of NextGen. The criteria include such factors as locations where NextGen capabilities are being initiated between 2010 and 2015, ranking by delays and traffic volumes, diversity of operations and availability of data. The Task Group recommends that the city pairs be reviewed on a periodic basis as NextGen is implemented.

The Task Group determined that the Metroplex was the appropriate proxy to use for city pairs rather than specific airports. For the purposes of this report 'Metroplex' and 'city pair' are synonymous. The

Metroplex was chosen to provide a clear summarized ”picture” that would be relevant for policy makers, the public and others interested in understanding the impact of NextGen in key city pairs.

The Task Group agreed that the term “city pairs” (as referenced in the reauthorization bill) refers to all the key airports within the city at either end of a city pair. A “Metroplex” refers to all the airports within a given city or metropolitan area, which can in some cases span beyond a single city (e.g., South Florida). “Airports” refer to the individual airports within a given city (e.g. New York) or Metroplex (e.g., New York, Northern California).



Approach

To develop the list of key city pairs, the Task Group followed a methodical approach leading to repeatable and transparent results. The steps in that process were as follows:

1. Identified the specific performance metrics related to city pairs contained in Section 214, Performance Metrics from the FAA Modernization and Reform Act of 2012 (Public Law 112-95), (see Appendix B). These are:

- Fuel burned between key city pairs
- The average distance flown between key city pairs
- Flown versus filed flight times for key city pairs

2. Considered the applicability of locations and capabilities contained in the RTCA NextGen Mid-Term Implementation Task Force (TF5) and the FAA NextGen Implementation Plan (NGIP) as potential input for determining key city pairs.

3. Reviewed and discussed the relevance and potential criteria used by the ICWG to determine Metroplex prioritization and the outcome of applying the Metroplex selection criteria, namely, the prioritized list of Metroplexes. The documents are:

> "Findings and Recommendations: Metroplex Prioritization and Integrated Capabilities Scoping & Requirements" (September 2011)
>
> "Refinement of Integrated Capabilities Definitions and Completion of Mapping Exercises" (May 2012)

4. Reviewed the draft metrics recommendations developed by the BCPMWG for consideration by the NAC at the October 2012 meeting as well as preliminary work on potential criteria to determine key city pairs. The Task Group reached a consensus that "city pair" included Metroplexes, or any of the airports within the metropolitan area around the city. That is, the scope was broader than single airport-to-airport pairs such that it may include Metroplex-to-Metroplex pairs.

5. Subsequently refined the criteria used by ICWG and BCPMWG, as well as other considerations identified to create a single set of criteria. The criteria were designed to identify locations where: (1) a large need for improvement exists (e.g. due to significant delays); (2) NextGen investments have been made and where improvements are expected; (3) a large volume of operations occur; (4) a range of user constituencies and stakeholders can be represented; and (5) data and resources are available with which to establish a baseline and compute the necessary metrics.

6. Conducted final review of the criteria by Subject Matter Experts to refine the weighting of criteria and apply additional qualitative analysis and other considerations.

To begin the process of evaluating and refining the criteria, the initial list of city pairs was expansive, but it was an important step to determine the relevance of the criteria.

Methodology

The Task Group developed and applied the following set of criteria to identify the key city pairs:

Criteria:

- City pairs (or Metroplex pairs) should be within the contiguous US
- The Metroplex is expected to have a measurable NextGen impact between 2010 & 2015 (each Metroplex will include the associated airports)

- Consider the ICWG tier 1 Metroplexes (7)
- Consider sites from the FAA/Industry Optimization of Airspace and Procedures in the Metroplex (OAPM1) initiative that are scheduled to begin implementation of capabilities no later than FY2015
- Number of operations (traffic) between city pairs[1] should be considered
- Need between the city pairs should be considered[2]. The Task Group used 'amount of delay' as an indicator of need.

In addition to the Criteria, the Task Group developed the following set of "Other Considerations":

Other Considerations:

- Data availability
- Ease of reporting (i.e. data that is recorded in an automated and accessible format and a viable approach to reporting the performance can be developed)
- Diversity – as a final review, evaluate the key city pairs for diversity of operations/different stakeholders (e.g., cargo, GA, multiple air carriers)

The Task Group applied the above criteria and produced an initial list of 24 Metroplexes. To reduce the number of Metroplex pair combinations by half, the Task Group first agreed that all such pairs would be non-directional. The group then rank-ordered each Metroplex pair by delay, considering all potential airport pairs between the two Metroplexes. From this rank-ordered list, the group identified 22 Metroplex pairs that had high levels of delay and which encompassed all of the Metroplexes under consideration.

Recognizing that the actual measurement between city pairs must be done at the airport level, the Task Group considered all airport pairs within one of the 22 Metroplex pairs. Given that many airport pairs had negligible impact on delay, the group agreed that a subset of airport pairs would be appropriate to capture NextGen impacts within a Metroplex pair. To reduce the number of airport pair combinations to a manageable number, the Task Group analyzed all the airports by amount of delay, and within each Metroplex, selected the top airport pairs contributing to approximately 50% of the overall delay within the Metroplex.

The resulting list of approximately 80 airport pairs represents the top 50% delay contributors within each of the 22 Metroplex pairs. To ensure that the list did not exclude airport pairs with substantial delay that did not appear in the top 50% for a particular Metroplex, the Task Group included all city pairs with delay at least as high as the city pair with the lowest amount of delay on the initial list.

[1] City pairs are meant to be non-directional.

[2] Because the available means to measure NextGen implementation is by airport pairs, the Task Group identified 84 airport pairs that have the greatest potential based on the number of delays that were contained in the Metroplex. These were selected based on identifying the numbers of delays and are identified in Appendix C.

Next, the Task Group applied the "Other Considerations" and additional modifications to the list as described below:

- Data availability – The Task Group agreed that data could be collected for the three metrics for all pairs on the list. The most difficult to collect are data for the fuel burn metric that is being addressed in a separate report on fuel data collection.
- Ease of reporting - The Task Group looked at a number of options for reporting performance between city pairs for each of the three metrics and agreed that a viable approach could be developed. That information can be made available to the FAA if needed, as the Agency implements the metrics tracking.
- Diversity – This analysis led the Task Group to add two city pairs to encompass cargo carrier traffic: EWR-MEM and EWR-SDF. The Task Group participants agreed that no additional airports needed to be added to address business jet traffic for this exercise.

Finally, in October 2012, the initial set of city pairs was discussed at the NAC. In addition to endorsing the initial list of city pairs, the NAC members asked that the Key City Pairs Task Group reconvene to evaluate city pairs for possible inclusion of U.S. transcontinental pairs. In addition, the NAC expressed a desire to capture city pairs in which aircraft spend most of the time on the surface and in arrival/departure phases of flight, and suggested the Task Group consider additional city pairs with a regional operator focus.

Transcontinental (Transcon) City Pairs: The Task Group evaluated adding transcontinental city-pairs to capture additional NextGen benefits in en route airspace and concluded that it is relevant to include a representative Transcon city pair. The Task Group observed that the characteristics of the transcontinental city-pairs, in comparison to the other city pairs, included low operations numbers, low delay hours, and variations in flight paths. There was also a caution against overweighting Transcon pairings based on relevance for NextGen measurements. Based on these considerations, the Task Group added a single transcontinental city pair: New York - Southern California.

Regional City Pairs: The Task Group also considered adding one or more city pairs that have a significant representation by regional airline operators. In evaluating the list of 24 city pairs recommended to the FAA, it became apparent that these capture significant regional operations that include both short-lengths as well as long-haul regional flights. For example, regional operations account for 50% or more of total operations in the following Key City Pairs: Chicago – Memphis, Memphis – New York, Charlotte – Chicago, and Charlotte – New York. Other city pairs included in the recommended list also include a significant percentage of regional operations. Based on the observation that there is already a significant representation of regional operations, the Task Group concluded that no additional regional city pairs are necessary.

The resulting list of airport pairs within the set of recommended city pairs is in Appendix C.

Recommendations

The following list contains the 25 key city pairs selected based on the criteria above. It is important that the list of key city pairs be re-evaluated on a periodic basis to ensure the list includes the relevant locations for NextGen improvements.

Key City pairs

Northern California	Southern California
New York	South Florida
Chicago	New York
Boston	Washington DC
New York	Orlando
Atlanta	New York
Charlotte	New York
New York	Washington DC
Las Vegas	Southern California
Boston	New York
Dallas	Houston
Charlotte	Chicago
Charlotte	Washington DC
Chicago	Washington DC
Phoenix	Southern California
Chicago	Philadelphia
Chicago	Denver
Atlanta	South Florida
Chicago	Minneapolis
Denver	Southern California
Northern California	Seattle
Chicago	Memphis
Memphis	New York
Louisville	New York
New York	Southern California

Appendix A

Members of Metrics City Pair Task Group

NACSC co-chairs:

Steve Brown, NBAA (Task Group Chair)

Tom Hendricks, A4A/National Air Transportation Association

ICWG co-chairs:

Tom Bock, PANYNJ

Sarah Dalton, Alaska Airlines

BCPMWG co-chairs:

Debby Kirkman, MITRE

Ed Lohr, Delta Air Lines

APWG co-chairs:

Mark Hopkins, Delta Air Lines

Bill Murphy, IATA

FAA:

Lynn Ray (ATO)

Gisele Mohler (NextGen)

RTCA:

Andy Cebula/Margaret Jenny/Jennifer Iversen

Jim Kuchar (MIT LL)

Appendix B

FAA Modernization and Reform Act of 2012

(Public Law 112-95)

Section 214 Performance Metrics

(a) IN GENERAL.—Not later than 180 days after the date of enactment of this Act, the Administrator of the Federal Aviation Administration shall establish and begin tracking national airspace system performance metrics, including, at a minimum, metrics with respect to—

(1) actual arrival and departure rates per hour measured against the currently published aircraft arrival rate and aircraft departure rate for the 35 operational evolution partnership airports;

(2) average gate-to-gate times;

(3) fuel burned between key city pairs;

(4) operations using the advanced navigation procedures, including performance based navigation procedures;

(5) the average distance flown between key city pairs;

(6) the time between pushing back from the gate and taking off;

(7) continuous climb or descent;

(8) average gate arrival delay for all arrivals;

(9) flown versus filed flight times for key city pairs;

(10) implementation of NextGen Implementation Plan, or any successor document, capabilities designed to reduce emissions and fuel consumption;

(11) the Administration's unit cost of providing air traffic control services; and

(12) runway safety, including runway incursions, operational errors, and loss of standard separation events.

(b) BASELINES.—The Administrator, in consultation with aviation industry stakeholders, shall identify baselines for each of the metrics established under subsection (a) and appropriate methods to measure deviations from the baselines.

(c) PUBLICATION.—The Administrator shall make data obtained under subsection (a) available to the public in a searchable, sortable, and downloadable format through the Web site of the Administration and other appropriate media.

(d) REPORT.—Not later than 180 days after the date of enactment of this Act, the Administrator shall submit to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Transportation and Infrastructure of the House of Representatives a report that contains—

(1) a description of the metrics that will be used to measure the Administration's progress in implementing NextGen capabilities and operational results;

(2) Information on any additional metrics developed; and

(3) A process for holding the Administration accountable for meeting or exceeding the metrics baselines identified in subsection (b).

Appendix C

Measuring the NextGen Impact at the Key City Pairs

The following 85 airport pairs would provide the means to measure the impact of expected NextGen implementation of the key city pairs.

Airport 1	Airport 2	Metroplex
LAX	SFO	Northern California – Southern California
SAN	SFO	Northern California – Southern California
LAX	OAK	Northern California – Southern California
SFO	SNA	Northern California – Southern California
LAX	SMF	Northern California – Southern California
EWR	FLL	New York – South Florida
FLL	LGA	New York – South Florida
FLL	JFK	New York – South Florida
JFK	MIA	New York – South Florida
EWR	PBI	New York – South Florida
EWR	ORD	Chicago – New York
LGA	ORD	Chicago – New York
BOS	BWI	Boston – Washington DC
BOS	DCA	Boston – Washington DC
BOS	IAD	Boston – Washington DC
EWR	MCO	New York – Orlando
JFK	MCO	New York – Orlando
ATL	LGA	Atlanta – New York
ATL	EWR	Atlanta – New York
CLT	EWR	Charlotte – New York
CLT	LGA	Charlotte – New York
DCA	EWR	New York – Washington DC
IAD	LGA	New York – Washington DC
IAD	JFK	New York – Washington DC
LAS	LAX	Las Vegas – Southern California
LAS	SAN	Las Vegas – Southern California
BOS	EWR	Boston – New York
BOS	JFK	Boston – New York
DAL	HOU	Dallas – Houston
DFW	IAH	Dallas – Houston
CLT	ORD	Charlotte – Chicago
CAE	ORD	Charlotte – Chicago
BWI	CLT	Charlotte – Washington DC
CLT	IAD	Charlotte – Washington DC
CLT	DCA	Charlotte – Washington DC

BWI	RDU	Charlotte – Washington DC
DCA	ORD	Chicago – Washington DC
BWI	ORD	Chicago – Washington DC
LAX	PHX	Phoenix – Southern California
PHX	SAN	Phoenix – Southern California
ORD	PHL	Chicago – Philadelphia
DEN	ORD	Chicago – Denver
COS	ORD	Chicago – Denver
ATL	FLL	Atlanta – South Florida
ATL	MIA	Atlanta – South Florida
ATL	FLL	Atlanta – South Florida
ATL	MIA	Atlanta – South Florida
MSP	ORD	Chicago – Minneapolis
DEN	LAX	Denver – Southern California
SEA	SFO	Northern California – Seattle
MEM	ORD	Chicago – Memphis
EWR	MEM	Memphis – New York
EWR	SDF	Louisville – New York
LGA	MKE	Chicago – New York
LGA	MCO	New York – Orlando
ATL	HPN	Atlanta – New York
LAX	SJC	Northern California – Southern California
JFK	ORD	Chicago – New York
BUR	SFO	Northern California – Southern California
JFK	RDU	Charlotte – New York
PSP	SFO	Northern California – Southern California
BWI	PVD	Boston – Washington DC
OAK	SAN	Northern California – Southern California
EWR	MIA	New York – South Florida
LGA	MDW	Chicago – New York
LGA	MIA	New York – South Florida
LAX	TUS	Phoenix – Southern California
ABE	ORD	Chicago – New York
BDL	BWI	Boston – Washington DC
EWR	MKE	Chicago – New York
ORD	RDU	Charlotte – Chicago
ONT	SFO	Northern California – Southern California
SAN	SMF	Northern California – Southern California
EWR	JAX	New York – Orlando
JFK	PBI	New York – South Florida
EWR	MDW	Chicago – New York
CLT	JFK	Charlotte – New York

Attachment 6 Recommendation for Key City Pairs

EWR	GSO	Charlotte – New York
DEN	MKE	Chicago – Denver
BWI	MHT	Boston – Washington DC
LGA	PBI	New York – South Florida
SAN	SJC	Northern California – Southern California
BWI	ISP	New York – Washington DC
HPN	MCO	New York – Orlando
EWR	LAX	New York – Southern California

Committee Group Exercise

- **Write Press Release – Catchy Title…**
- **Characterize ideal future when fully implemented**
- **Describe what is being deployed**
- **Highlight measurable benefit public would notice**
- **Consider NAC recommended metrics**

Group A

NextGen: What's Out, What's In for Air Travel - *What's Hot, What's Not*!

OUT	**IN**
• Missed connections	• On time arrivals all the time
• Delays	• Shorter flight times
• Increasing fares	• Stable fares
• Emissions	• Cleaner flights
• Noise pollution	• Quieter flights

Bottom line to the traveler: reduced hassle factor

Group B

Flying Safer, Smarter, Faster, Greener …. with NextGen!

- We use to increase capacity by building new runways and airports
- We use to increase predictability by increasing flight times
- We use to enhance safety by spacing planes farther a part

But now …

With new NextGen technologies, policies and procedures we get more flights, more direct routing, better predictability, enhanced safety and reduced fuel-burn.

NextGen – taking advantage of satellite technologies like GPS to make air travel more precise, predictable, safe and green. It's the future – now!

Group C

Nation's Capitol nearly free of flight delays with uncompromised safety and environmental benefits – all due to NextGen!

The collaboration of government, industry and the community is making Dulles Airport the airport of choice.

This is enabled through the implementation of sophisticated technology that allows airplanes more efficient flight, with direct routes, fly more safely, more quietly -- advanced communication tools and improved flight patterns.

Passengers around-the-world will benefit from significantly increased on time travel, higher levels of safety and less time on the ground.

All of this is possible while reducing administrative costs and providing a cleaner and quieter environment.

The FAA and its industry partners are holding themselves accountable through a robust set of metrics to ensure that goals are achieved.

Group D

Imagine a world without flight delays or diversions –

A world that runs on time with next generation airspace technology. This is possible.

As airlines adopt and the FAA approves this new technology, all of this is possible.

Leading consumers to lower-cost travel, reduction in environmental impact – all in a safe and efficient air travel system!