National Air Traffic Controllers Association
AFL-CIO

Testimony of

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Introduction

The National Air Traffic Controllers Association (NATCA) is the exclusive representative of over 15,200 air traffic controllers serving the Federal Aviation Administration (FAA), the Department of Defense (DOD) and the private sector. In addition, NATCA represents FAA's Alaska flight service specialists and approximately 1,200 FAA engineers, 600 traffic management coordinators, 500 aircraft certification professionals, agency operational support staff, regional personnel from FAA's logistics, budget, finance and computer specialist divisions, as well as agency occupational health specialists, nurses and medical program specialists.

Air traffic controllers are dedicated to ensuring that our National Airspace System (NAS) is the safest and most efficient in the world. In order to maintain that safety and efficiency, our controllers work to improve safety procedures, modernize the NAS and promote new technology. We have professional controllers involved in nearly every modernization and NextGen-related program the FAA is currently working on. Controller skills are put to work every day as they handle an impressive volume of flights – air traffic controllers separate more than 70,000 flights each day, safely moving nearly two million passengers through our skies daily. Air traffic controllers handle these flights in the busiest and most complex airspace in the world with roughly 5,000 planes in the sky at any given moment.

NextGen

The Next Generation Air Transportation System (NextGen) is the FAA's effort to modernize the nation's air traffic control system. NATCA fully supports NextGen modernization, which will allow the FAA to meet increased demand while improving the safety of the NAS, reducing delays and protecting the environment. According to the FAA's vision, NextGen will enable more aircraft to safely fly closer together on more direct routes, reducing delays, carbon emissions, fuel consumption and noise.

NextGen will transform the national air transportation system, using new and existing technologies including satellite navigation, advanced digital communications, and enhanced connectivity between all components of the NAS.

NATCA is proud to be involved in all aspects of the process as an essential stakeholder. NATCA and the FAA both recognize that stakeholder involvement is the key to continued success to NextGen. In addition to being present on NextGen projects, NATCA is represented as a member of the Radio Technical Commission for Aeronautics (RTCA), the FAA Management Advisory Council (MAC), and the NextGen Advisory Committee. Our presence, as well as that of industry leaders, has been an important addition to the discussion on modernization.

NATCA can point to two instances where collaboration has produced concrete benefits and savings for the FAA and the flying public. First, in the Optimization of Airspace and Procedures in the Metroplex (OAPM) program, early returns in the Washington, D.C. area indicate substantial fuel savings and reduced carbon emissions. A total of four new procedures have been implemented which optimize descents, allowing for fuel savings. The OAPM team credits collaboration for the success seen so far on the project.

Second, NATCA helped save the FAA $7 million dollars during a monitor upgrade. Controllers discovered a problem in newly installed monitors that made them flicker. The company offered to fix the problem for $9 million, but NATCA instead suggested assembling a tiger team to resolve the issue internally, and was successful in finding a solution. The NATCA/FAA team spent about $1 million, and the company offered to make the change to the rest of the monitors for $500,000, saving about $7 million in the process.

NATCA, the FAA, and other stakeholders have acknowledged the RTCA's 2009 recommendations, and as the 2012 Department of Transportation Inspector General (IG) report notes, the FAA is incorporating the RTCA's recommendations into NextGen plans. However, delays have occurred for a variety of reasons, including lack of funds, lack of personnel, and management issues. Nonetheless, NATCA believes NextGen is making significant progress. We are here today to testify about key areas of NextGen that we see as successfully moving forward. Those areas are OAPM (also known as Metroplex), Area Navigation (RNAV), Automatic Dependent Surveillance-Broadcast (ADS-B), DataComm, Greener Skies Over Seattle, and En Route Automation Modernization (ERAM). In addition, we will discuss controller training.

Progress in NextGen Projects

Optimization of Airspace and Procedures in the Metroplex: The Optimization of Airspace and Procedures in the Metroplex (OAPM), also known simply as Metroplex, is a joint effort by the FAA and industry aimed at integrating airspace and deconflicting traffic flows over major metropolitan areas (known as metroplexes). OAPM study teams rely on current aircraft navigation capabilities to enhance airport arrival and departure paths, provide diverging departure paths to get aircraft off the ground more quickly, and add more direct, high-altitude RNAV navigation routes between metroplexes.

Progress: Through collaboration involving all stakeholders including airports, airlines, the military, managers, labor and the government, we have already progressed to the design and implementation stage in Charlotte, Atlanta, and Northern California.

Value of Collaboration: During each OAPM, collaboration has been the key to success throughout the process. All stakeholders have been invited to participate in the study teams in which participants analyze and describe the operational challenge in a given metroplex, then assess planned solutions, and develop theoretical airspace and procedures. The study teams also conduct initial estimates of costs, benefits and risks, and make recommendations. Their theoretical solutions, analyses, data, and recommendations then go to the Design and Implementation Teams, which execute the design and conduct operational, safety, and environmental analyses and assessments. Working collaboratively, we have reduced the number of metroplex test sites because the FAA didn't have the resources, and because we have been strategic about site selection. Collaboration allowed the FAA to eliminate OAPM sites that had pre-existing projects such as Greener Skies or legacy airspace projects (down to 13 from 21 in Round One).

Success: OAPM is already yielding positive results. For example, teams in Dallas for the North Texas OAPM team recently began reviewing their work with MITRE Corporation. Based on their joint calculations, savings for airlines could be as much as $21 million annually through reduced fuel consumption while also easing controller workload and making controllers more efficient. In Atlanta, the OAPM teams found savings by re-working existing routes, saving airlines as much as $22 million annually in reduced fuel consumption.

Barriers to complete efficiency: Everyone involved is excited about the efficiencies OAPM has to offer, yet we are not currently able to reach optimal efficiency. There are several barriers to achieving this goal, including the need for new aircraft spacing and sequencing technologies, harmonizing aircraft equipage, and streamlining the rule-making process at the FAA to better take advantage of the new procedures.

- One key part of OAPM involves optimizing descents so that aircraft can fly idle throughout their descent, which vastly reduces fuel consumption. As an aircraft approaches, there is an ideal point for the aircraft to begin its descent, but that point is 150 to 200 miles out from the airport. Controllers currently space and sequence aircraft when they are much closer to the airport, so in

order for optimized profile descents to work, controllers will need a new tool for spacing and sequencing the aircraft from a greater distance before they reach the point of descent. This will require new technology that at present has yet to be established.

- Equipage is another barrier to optimization, as not all aircraft are equipped equally. Those aircraft without vertical navigation (VNAV) are workload intensive for the pilot because the pilot has to manually add the new approaches developed by OAPM. As long as "mixed equipage" prevails in the NAS, we will have difficulty implementing approaches that work for everyone. While NATCA takes no position on how best to incentivize or assist in the purchase of the equipment for airlines and aircraft owners, it is clear that proper equipment will be needed in order for every aircraft to gain maximum efficiencies.

- The long and laborious rulemaking process for the FAA wastes valuable time. Changes are needed in order to streamline the rulemaking process to better implement the new efficiencies being developed by OAPM.

DataComm: DataComm is a program that will allow controllers and pilots to send text messages back and forth, reducing or eliminating the need for voice communications. A majority of these messages will be integrated into the flight deck avionics to help save time and remove issues of incorrect data entry.

DataComm is currently in Segment 1 Phase 1, which involves sending departure clearances and revised clearances directly to the flight deck from the tower. Known as Tower Departure Clearance (DCL), this will connect the tower to the flight deck to send initial and revised clearances without the need for voice communications. It will also load clearances into the flight management system (FMS) for pilot review and acknowledgment. Essentially it provides pre-departure clearance (PDC) that connects directly to the flight deck and allows controllers to send revisions. Currently, a PDC is sent to the aircraft through a third party, which sends the message to the Airlines Operations Center (AOC). AOC then sends the message to the flight deck or to the gate. These communications require on average three to five minutes to send via voice. With DCL, it takes one to two minutes to complete the same transaction via DataComm, saving several minutes for each departure for revised departure. This saves time, and leaves fewer opportunities for miscommunication via voice.

Progress: Currently no facilities use DataComm. The program office is preparing trials at three towers: Memphis Tower (MEM), Newark Tower (EWR), and Atlanta Tower (ATL) for tower services. The first rollout is slated for November 2012 at MEM with EWR beginning around April 2013 and ATL around July 2013. Segment 1 Phase 1 DCL will be going into 41 sites beginning March 2016, with initial deployment taking place at those sites over several years. Segment 1 Phase 2 is scheduled for a 2018/2019 initial deployment with Segment 2 Phase 1 scheduled for 2025.

Example of Benefits DataComm Will Bring:

- During severe weather, an aircraft may currently receive several different routes within a period of thirty minutes. With DataComm, revised routes can be sent with a few clicks to the flight deck, saving valuable time as the aircraft is rerouted. This is especially helpful when there is a language barrier that could occur with non-English speaking pilots.

- DataComm also benefits surface operations when it saves time – saving time while aircraft are holding for departure clearance reduces the backlog that could otherwise occur.

Benefits of Collaboration: Overall, NATCA has been participating with other stakeholders on DataComm. Three sites have been selected for initial tests, and all local stakeholders have been engaged. While the focus is now on terminal facilities, NATCA continues to have a full-time representative

working on the en route side. Field collaboration is going well, but that same collaborative attitude is not reflected throughout the FAA management ranks. Nonetheless, through some successful collaboration, NATCA and the FAA have been able to address functionality problems earlier in the process and prevent them from compounding in later stages.

Barriers: Like other NextGen programs, DataComm relies on equipage to function. To achieve maximum benefits, aircraft must equip with the DataComm technology.

ADS-B: Automatic Dependent Surveillance-Broadcast (ADS-B), one of the cornerstone components of NextGen, is the broadcast of the GPS-derived position report of an aircraft or vehicle. As this technology continues to evolve, and aircraft equip with ADS-B Avionics, controllers will see an increase in surveillance coverage not provided by traditional radar sources.

Progress: The automation platforms STARS, CARTS, and ERAM accept ADS-B Data, and the ground infrastructures are all well underway. Approximately 500 Radio Stations of the 730 planned, will be operational by the end of fiscal year 2012. As of August 30, 2012, a total of six terminal facilities have gone operational with FUSION/ADS-B: Philadelphia (PHL), Louisville (SDF), Houston (I90), New Orleans (MSY), El Paso (ELP), and Southern California (SCT). SCT identified an issue and reverted back to Single Sensor, but is expected to return after verifying the fix has resolved the issue. At en route facilities, Houston ARTCC (ZHU) has completed limited runs of ERAM with ADS-B adapted in Domestic Airspace. An additional 12 terminal and four en route facilities are expected to be operating with ADS-B capabilities by the end of FY 2012.

Benefit of Collaboration: Collaboration has been an important part of the success – the Surveillance Broadcast Services (SBS) office is heavily in favor of collaboration. NATCA has been involved in all aspects of ADS-B and has identified shortcomings that save money in the long run.

Example of Success: ADS-B is providing unprecedented surveillance in the Gulf of Mexico and Alaska. This surveillance replaced the use of a grid system that was at best confusing on most days. The surveillance has allowed for more direct routes, which increases the efficiencies of the operations for helicopters. Areas that had no radar surveillance coverage now provide controllers the ability to offer services and assistance to pilots. Required safety work is being completed to allow ADS-B Surveillance into areas of Domestic Non-Radar Airspace.

Barrier: Equipage: The benefit of having increased surveillance coverage is limited to the number of aircraft that have certified Minimum Operational Performance Standards (MOPSB) avionics (this meets the certification requirements in the FAA ADS-B Mandate of 2020). As of September 4, 209 aircraft had MOPSB avionics. Incentivizing aircraft operators to equip prior to the FAA Mandate of 2020 is one of the biggest challenges facing the FAA. The FAA has entered into and is currently pursuing agreements with Jet Blue, UPS, United, and US Airways, as well as the original Capstone aircraft in Alaska and the helicopters in the Gulf of Mexico to upgrade their legacy avionics to MOPSB.

RNAV and RNP: Area Navigation (RNAV) and Required Navigation Performance (RNP) are the two main components of Performance Based Navigation (PBN). The FAA describes PBN as a framework for defining performance requirements in "navigation specifications" that contain detailed aircraft operator/pilot requirements. PBN flight routes and procedures allow aircraft to fly more direct routes and the FAA to optimize the use of airspace, which will increase airspace capacity and reduce delays. RNAV enables aircraft to fly without relying solely on ground-based navigation aids. Aircraft can fly on any desired flight path within the coverage of ground- or space-based navigation aids, within the limits of the capability of aircraft self-contained systems, or a combination of both capabilities. RNP is RNAV with

the addition of on-flight monitoring of an airplane's performance. The pilot receives an alert if the aircraft is not performing in accordance with the requirements for a specific procedure.

Progress: RNAV and RNP are already saving fuel and money through more efficient approaches. There are many more gains to be found once RNP is better understood and is used to de-conflict airspace such as the airspace around New York City. RNP is the answer to increasing efficiency between Kennedy (JFK), Teterboro (TEB), and Newark (EWR).

Examples of Success:

- Phoenix has been very successful since October 2006 when terminal use of RNAV approaches generated five gallons per flight of fuel savings. Their reductions in carbon monoxide emissions were estimated at 2,500 metric tons annually.

- Midway – RNP with curved paths enables simultaneous arrivals to Midway (MDW) and departures from O'Hare (ORD) where they weren't possible before. Previously, ORD departures would have to be stopped to accommodate MDW arrivals on certain runway configurations. RNP allows the two to occur simultaneously without disrupting either.

Barriers: Equipping all aircraft will be necessary in order to achieve the maximum gains. Industry buy-in will be necessary to accelerate RNP usage. Use, deployment, equipage, and awareness all continue to increase. Operational use from pilot's perspective is also increasing.

Greener Skies: The Greener Skies Over Seattle program's primary goal is to conduct a safety analysis of satellite navigation arrivals and approaches in close proximity to or in conjunction with other approaches. The results from this program will be applied nationwide. Greener Skies is fundamentally similar to OAPM. The key difference is the collision risk safety analysis that would be lost in the OAPM process. The interaction and potential risks between satellite and ground surveillance is unknown. Early results of how they interact are promising. The FAA, including Oversight and Safety, are involved in this risk analysis.

Progress: The FAA determined that Seattle was an ideal location due to the runway configuration at the Seattle-Tacoma Airport (SEA) and the close proximity of SEA Boeing Field airport (BFI). The safety analysis includes aircraft interactions using multiple runways at SEA, in addition to aircraft interactions arriving concurrently at SEA and BFI. This safety work should lead to air traffic control rule changes that will allow controllers to more efficiently approve the use of satellite navigation approaches more efficiently in the Seattle area. Additionally, these rule changes may be applicable to the entire national airspace system. The need for these rule changes was recently identified as a major inhibitor to the expanded use of satellite navigation approaches system wide.

Benefits of Collaboration: NATCA has been collaboratively involved throughout the entire Greener Skies project and the team has acknowledged our organization as essential to the expediency and quality of the effort thus far. The data gathered during testing of the arrival and approach will be submitted to a vendor that is responsible for development of the safety analysis.

ERAM: En Route Automation Modernization (ERAM) will replace the 40-year-old en route host computer and backup system used at 20 FAA Air Route Traffic Control Centers (ARTCC) nationwide. ERAM will increase capacity and improve efficiency, allowing controllers to track 1,900 aircraft simultaneously, compared to the current 1,100 flight limitation. ERAM will extend coverage beyond facility boundaries, enabling controllers to handle traffic more efficiently. This extended coverage is possible because ERAM will process data from 64 radars versus the 24 radars currently processing with the Host system. Although not technically a NextGen program, ERAM's increased processing power is

the backbone of many of the NextGen technologies, that rely on successful ERAM deployment. For example, DataComm requires ERAM, as do Traffic Flow Management System (TFMS), Ground Based Interval Management (GIM), Flight Deck Based Interval Management (FIM), Time Based Flow Management (TBFM), and NextGen Network Enabled Weather (NNEW)/Reduced Weather Impact (RWI).

Progress: The controller workforce is eager to begin using ERAM, and is enthusiastic about its testing and rollout across the country. As of August 20, 2012, nine of the 20 ARTCCs are running ERAM operationally to control traffic. Five of the ARTCCs Salt Lake City (ZLC), Seattle (ZSE), Denver (ZDV), Albuquerque (ZAB), Minneapolis (ZMP)), have achieved continuous operations with ERAM utilized 24/7 for air traffic operations in approximately 1.5 million square miles of airspace. ERAM is installed and being tested in Chicago (ZAU), Oakland (ZOA), and California (ZLA). Houston (ZHU), New York (ZNY), Kansas City (ZKC), and Boston (ZBW), will be testing by the end of 2012 according to the FAA's schedule. The remaining eight ARTCCs in Indianapolis (ZID), Washington (ZDC), Cleveland (ZOB), Atlanta (ZTL), Miami (ZMA), Memphis (ZME), Fort Worth (ZFW), and Jacksonville (ZJX), are due to begin operations by the end of 2013. According to the FAA, final, continuous operations are expected at all 20 ARTCCs by August 2014, according to the FAA. NATCA is optimistic and will continue doing what we can do to make sure ERAM is implemented on time and on budget.

Benefits of Collaboration: Over the past few years, the FAA and NATCA have developed a strong relationship based on respect and trust. That relationship has led to smooth resolution of disagreements over ERAM rollout. For example, at one facility (ZLA), a problem was discovered right before ERAM was scheduled to go online. NATCA's position was that the problem needed further investigation, but the management team wanted to move forward immediately. The disagreement went through the established process and NATCA and the FAA were able to resolve the issue without any drawn out arguments. This kind of collaborative relationship has contributed to ERAM's progress.

Barriers: ERAM faces one significant challenge: insufficient resources to test and deploy. There simply aren't enough Certified Professional Controllers in the field to assist the facilities in testing ERAM software, especially when multiple facilities are scheduled to conduct tests simultaneously. Additional trained personnel will be necessary in order to stay on schedule and on budget

Additional Concerns:

Training and Procedures: NATCA has been working to keep controllers informed of new rules and procedures as they are being developed. However, it is difficult to criticize the FAA's training process when the rules and procedures for RNAV and RNP are still being written – controllers can't be trained for procedures that don't yet exist. We need a controller handbook for performance based navigation (PBN), and we will begin training once that is complete.

However, NATCA agrees with the IG that the controller workforce lacks a basic understanding of the technologies and capabilities of RNAV and RNP. The sooner the controller workforce can be exposed to and made aware of new technologies, the easier it will be to train and reach proficiency once the rules and procedures are finalized.

NATCA agrees with the IG that the FAA lacks a consistent training program for new technology and procedures. RNAV and RNP in particular require more training. A high ratio of trainees to controllers at busy metroplex facilities also creates a problem, as many of the senior controllers will be retiring in the next few years, leaving a training gap. The impending retirement wave coupled with the influx of new hires will place a strain on many facilities that will not have the personnel to adequately train trainees.

NATCA and the FAA have been aware of this issue for several years, and acknowledge it will be a hurdle to overcome when training for new rules and procedures.

Recommendations:

- **Continued Collaboration:** Continue to focus on collaboration and stakeholder involvement in order to reach realistic deadlines.

- **Industry Buy-In:** As discussed in OAPM, ADS-B, and RNP, all aircraft must be adequately equipped in order to achieve maximum safety and efficiency gains. The aviation industry must have confidence in the FAA and their projects before they will invest millions of dollars on new technology. Equipage is indispensable for NextGen projects such as ADS-B and RNP.

- **Streamlining the Rulemaking Process**: The long and laborious rulemaking process for the FAA wastes valuable time. Changes are needed in order to streamline the rulemaking process to better implement the new efficiencies being developed by OAPM.

- **Middle Management:** The FAA needs to follow through at every level to ensure organizational alignment that delivers the efficiencies outlined in the Monitor Report. Collaboration amongst managers is essential.

We appreciate the opportunity to appear before the Committee to provide our input on the NextGen. We also welcome opportunities to work with the FAA and other members of the aviation community in a collaborative manner to provide the safest and most efficient air traffic control system in the world. Thank you.