STATEMENT OF

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AIR LINE PILOTS ASSOCIATION, INTERNATIONAL

BEFORE THE

SUBCOMMITTEE ON AVIATION

COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE

UNITED STATES HOUSE OF REPRESENTATIVES

WASHINGTON, DC

March 18, 2009

ATC MODERNIZATION AND NEXTGEN: NEAR-TERM ACHIEVABLE GOALS

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Good morning, Mr. Chairman and members of the Subcommittee. I am Captain Rory Kay, Executive Air Safety Chairman of the Air Line Pilots Association, International (ALPA). ALPA represents more than 52,250 pilots who fly for 35 passenger and all-cargo airlines in the United States and Canada. On behalf of our members, I want to thank you for the opportunity to provide our perspectives on the issues that are of great importance as both the FAA, as the Air Traffic Service provider, and the pilots and operators that use the system work to collaboratively modernize the National Airspace System into the Next Generation Air Transportation System (NextGen).

Today's US air transportation system is the safest in the world. The commercial aviation accident rate is on the order of 0.0007 per 100,000 departures for passenger airlines. If we speak only of passenger turbine powered aircraft, the number is about half that level. In other words: you are about 40 times safer in an airliner than on the safest highway system in the world. But we are at a crossroads. Our Air Traffic Control system is getting older and there are many systems on our aircraft that we are unable to use to their fullest capabilities. These shortcomings, left unchecked, eventually have the potential to decrease efficiency and even erode safety margins, because our air traffic system and infrastructure have not been kept up to date. Our colleagues in Europe are facing many of the same challenges, and have begun localized implementation of many NextGen-like concepts that are still being debated in the US.

In 1931, ALPA's founders chose the motto "Schedule with Safety." That era saw accident rates many times higher than those of today. In fact, over half the founding members of ALPA died in aircraft accidents, so ALPA was keenly aware of the continuing need to improve the safety of the air transportation system any way possible. Safety is still one of the two pillars for which ALPA stands. Over the past 78 years, the National Airspace System (NAS) has changed greatly. The air traffic control (ATC) system in the contiguous United States has moved from separating flights using radio position reports to positive control using radar that extends from coast to coast. The introduction of jet powered aircraft and liberalizing bilateral agreements made air travel affordable to larger segments of the world population. With the introduction of the Global Positioning System (GPS), a system originally designed by the Department of Defense as a precision method to attack targets and adapted by the aviation industry, aircraft navigation has

begun to move from a ground-based navigation system to a satellite-based navigation system and at the same time achieved levels of accuracy in positioning that are unprecedented.

Communications have also evolved from light signals and burning oil cans to lightweight and reliable radios, and are now using a data link technology akin to texting; yet we are unable to use satellite based surveillance and navigation to its fullest potential.

All of these changes have two things in common. They have made air travel safer, and they were successfully accomplished when there was a collaborative relationship between the government and the private sector. In each example, the private sector and government worked together to develop system and equipment specifications, new controller and pilot procedures, training requirements, and the development and implementation of ground and airborne infrastructure. ALPA is working actively with industry, the FAA, and the JPDO to ensure that NextGen is yet another example of a successful collaboration leading to fundamental change to the NAS.

However, NextGen requires a new way of thinking about the National Airspace System (NAS). No longer can we tolerate a NAS composed of a number of independent ATC systems and tools. NextGen must be an integrated blend of future technologies, procedures, and public policy reform designed to enhance system safety, increase throughput, and decrease emissions through the use of collaborative decision-making, more precise and efficient flight routings and separation standards.

Pilots literally sit at the intersection of new technology, operational measures, air traffic control procedures, and varying aircraft capabilities. This gives us a unique vantage point to see and experience firsthand what can happen if well-intended, but unrealistic operational procedures are instituted. Without thorough study and stakeholder involvement, complexity can increase, efficiency can decrease, and in some cases safety margins are eroded.

The future of air transportation will bring a combination of commercial air carriers, unmanned aerial vehicles, micro-jets "jet taxi" service, and general aviation. The airspace system of the future will involve a great many more operations than we have today in an increasingly complex environment. NextGen must be a flexible and scalable system capable of accommodating any fleet mix that evolves. The American people deserve a system that will readily accommodate that new demand – safely and seamlessly.

Funding NextGen

There is little debate over the need to modernize to sustain the growth in aviation and the concurrent demands on capacity. The problem is how to pay for it and who pays for it. As a nation, we all benefit from the airlines' return to economic solvency if capacity and efficiency can be improved. It has been demonstrated that new technologies and procedures can also increase safety, particularly in areas not well served by the current infrastructure. However, any new procedures and technologies must be thoroughly and systemically evaluated so we know that the level of safety is maintained or improved.

The continued road toward the implementation of NextGen will also require an additional element – a national resolve. Just like the development of the transcontinental railroad in the 19th

century or the interstate highway system during the 20th century, NextGen is a major step forward for the 21st century. National resolve is required to continue funding the operation of the current system while we research, develop, and implement NextGen components. While costly, we are left with no alternative. We can not just turn a switch and immediately transition from the existing ATC system to NextGen. This is an investment in our future as a nation and our leadership in the transportation world.

National resolve requires a sustained funding stream. In 1997, while a member of Congress, former Secretary of Transportation Norm Mineta chaired the National Civil Aviation Review Committee (NCARC). NCARC recommended the FAA's funding and financing system receive a federal budget treatment that ensured revenues from aviation users and spending on aviation services were directly linked and shielded from discretionary budget caps. This would ensure that FAA expenditures would be driven by aviation demand. While some movement has been made on this issue, this recommendation has not been fully implemented. With the movement toward NextGen, the issue of a sustained funding stream is even more urgent. Without a national resolve, the funding of NextGen is uncertain, and will most certainly cost even more and take much longer to implement.

NextGen has an enormous price tag so the economic risk of mistakes in development or implementation is significant. In January 2009, the Government Accountability Office (GAO) removed the FAA's air traffic control modernization program from its High Risk List (HRL) for the first time in 14 years. The HRL identifies Federal programs and operations that the GAO deems as high risk due to their greater vulnerabilities to fraud, waste, abuse, and mismanagement. The FAA was initially placed on the HRL in 1995 due to their poor track record of program deployment and cost over-runs. The GAO noted that management focus and willingness to attack and rectify their shortcomings were the reasons that it felt comfortable removing FAA modernization from the High Risk List. The GAO also noted the FAA's plan to continue improvements into 2009.

The current US ATC infrastructure is woefully outdated, the equipment's capabilities are limited, facilities are crumbling, efficiency is decreasing and capacity is limited. The delays and similar problems in the system that currently plague the ATC system clearly underscore the critical need for ongoing National Airspace System Modernization. Despite all that, it is a tribute to the dedication and professionalism of our pilots, controllers, and air traffic services employees that the system does continue to operate albeit at a slower tempo during periods of radar outages, poor weather, and mass congestion. The system we are given to work with cannot keep going indefinitely.

Sustained long-term funding of the Nation's airspace and air traffic control infrastructure is essential. ALPA feels that that funding must be comprised of Federal funds and fees requiring all airspace users to pay "their fair share" because all users will benefit from modernization. NextGen is simply a project that cannot be killed in mid stream. It is not the airlines but the FAA that realizes the first benefits. Airlines will see incremental benefits at first, if at all. Airports will see capacity increases and thus opportunity to increase their revenues more quickly. Once many of the pieces are in place, then efficiencies in airplane operations will manifest themselves in lower operating costs and fewer emissions. The airlines may not see benefits of

installing the new aircraft avionics for many years, but the equipage is necessary to build the foundation for the future. So where do you start passing the hat?

Obviously with a price tag this high, we must get this right the first time. Transforming the NAS has been likened to changing the tire on a truck while it is underway at 70 MPH. It can be done, but it must be well thought out and it will take new technologies to make it happen. ALPA is working with the FAA and industry stakeholders to insure that the airline pilot voice, the major operator, is a part of all discussions regarding the transition from the current ATC system to NextGen. This transition must be made without affecting the excellent safety record of the National Airspace System. Similarly, Congress must involve all stakeholders in a plan to develop ways to pay for modernizing the National Airspace System without driving our airlines out of business.

NEAR-TERM NEXTGEN GOALS

RNAV/RNP

Taking advantage of area navigation (RNAV and RNP) that offers a great deal of flexibility in procedure design and improved navigational accuracy available right now in many modern aircraft can be used to improve efficiency and reduce delays without compromising safety. However, efforts to use this technology to its fullest extent are lagging and must be accelerated.

In April 2002, FAA Administrator Jane Garvey announced the migration away from a ground-based navigation system to a "required navigation performance" (RNP) system. Airlines have long complained of sending aircraft to the boneyard with equipment that had never been fully utilized – equipment capable of operating independent of ground-based navigation systems. This avionics equipment had been developed and installed with the hope that the capabilities could be used. However, this was an example of how the private sector and government did not work in a collaborative manner.

NextGen must take better advantage of this aircraft capability. Area navigation (RNAV) uses onboard avionics that allow an aircraft to fly more direct and precise flight paths, improving efficiency. This enhanced navigation capability allows greater ATC flexibility in assigning routes compared to traditional ground-based procedures, which in turn allows ATC to put more aircraft in the same airspace safely. Using these improved procedures on departures has led to reduced departure delays, decreased taxi times, and reduced fuel burn and associated emissions. For example, RNAV operations have saved operators $8.5 million annually at Dallas/Fort Worth International Airport and a total estimated $34 million at Hartsfield-Jackson Atlanta International Airport. Required Navigation Performance (RNP) builds upon RNAV and allows flights to land with lower minima. Using RNP, in 2006 Alaska Airlines was able to continue 980 approaches that otherwise would have been diverted, largely due to adverse weather conditions. NextGen plans call for continued deployment of RNAV and RNP procedures, and we will begin to couple them with other decision support tools to maximize their capabilities.

RNAV allows aircraft to fly more fuel efficient arrivals into airports. This has been demonstrated at San Francisco, Atlanta, and other airports. Aircrews receive the arrival path guidance matched to a specific flight by taking into consideration factors including aircraft

performance, air traffic, airspace and weather. Boeing reported earlier this month that the tests carried out at San Francisco International Airport showed this method helped the airlines cut fuel consumption by 1.1 million pounds and cut carbon dioxide emissions by 3.6 million pounds extrapolated over one year.

One of the advantages of a satellite based navigation system is the ability to expand capacity of the existing airports through greater precision instrument approaches to all runways, not just those served by the ground-based workhorse of precision landing approach guidance, the Instrument Landing System (ILS). To meet this goal will require a rethinking of the FAA's instrument procedure production and maintenance capability. Currently the FAA develops and maintains over 13,000 instrument procedures. Approximately 20% of these approaches are published as satellite-based procedures, and the number continues to increase. However, a large number of these are in fact, RNAV versions of existing ground-based procedures. While we applaud this step toward reduction in the need for ground-based infrastructure, these so-called "overlay" procedures do not use the technology to improve efficiency. The FAA must accelerate the development, testing, and implementation of true RNAV procedures in order to improve efficiency safely.

In addition, the FAA is still maintaining 1,700 procedures based on non-directional beacons (NDBs), the oldest navigation technology in the NAS and as a result, using resources to maintain ground equipment based on navigation methods that are now approaching 100 years old. Instead of spending resources on older technologies, the resources should be spent on advancing the capabilities of the NAS. No longer can we afford to base the NAS on the lowest common denominator. Users that decide to equip with the newest technologies should benefit instead of being penalized.

ADS-B

Fifty years ago, two airliners collided over the Grand Canyon killing all on board both aircraft. As a result of this horrific accident, Congress demanded the establishment of an air traffic control radar system requiring commercial aircraft to be under positive radar control, that is ground surveillance. Once again government and industry collaborated to quickly establish a radar system across the NAS and at major airports that has evolved into the present system in use today.

In March, 2007, Administrator Blakey announced the surveillance system of the future – Automatic Dependent Surveillance – Broadcast (ADS-B). ADS-B, unlike radar does not rely on a ground based surveillance system of emitters and receivers. With ADS-B, each aircraft broadcasts a position report of where it "thinks" it is along with additional information. Any other receiving station, either on the ground or other aircraft can use the position report. In addition, limitations imposed on ground-based radar by terrain and antenna location cease to be a limiting factor. Controllers and flight crews will be able to know the real-time position of aircraft, on the ground or in the air. Just like radar increased the air traffic controller's situational awareness, ADS-B will increase situational awareness for everyone in the system.

In 2007, FAA issued a proposed regulation that, if finalized, would require ADS-B "Out" equipment on all aircraft operating in certain classes of airspace within the NAS by 2020. ADS-B "Out" refers to the broadcast of the position signal by the aircraft to ground stations. FAA has

yet not issued a regulation proposing a timeframe for the adoption of ADS-B "In", which would allow not only ground facilities, but suitably equipped other aircraft, to receive the inbound signal. Please remember that a radar uses ground based signals to determine the location and make calculations on the location of the aircraft in their airspace. By receiving better data directly from the source, that is the aircraft, you are freed of many constraints and can make both strategic and tactical decisions in how best to guide that airplane.

Once again, to be successfully implemented, ADS-B requires collaboration between industry and government. The FAA will recognize a substantial savings by reducing the number of ground radars sites while increasing reliability and efficiency. These cost savings should be used to find incentive programs for the early equipping of commercial aircraft. This approach, which was successfully used in the Capstone Program in Alaska, allows for the rapid equipage of aircraft, resulting in a faster implementation and adoption by those users. Faster implementation reduces the cost and increases the benefits for the FAA and users because there is a critical mass of participation before the benefits are realized.

Additionally, the government and industry should push for the careful development of some of the air-to-air ADS-B applications that benefit the users. These applications should result in faster equipage which will result in more benefits.

In January 2009, testing for NextGen accelerated with an agreement to equip US Airways aircraft with ADS-B. The FAA partnership with US Airways and Aviation Communication and Surveillance Systems (ACCS) will equip 20 US Airways Airbus A330s with ADS-B avionics for tests at Philadelphia International Airport.

Under the agreement, the A330s will use both ADS-B "In" and ADS-B "Out" signals. ADS-B "In" is information sent into the cockpit, and will be used to evaluate potential safety improvements on the airport surface; ADS-B "Out" involves an aircraft broadcasting information, such as its location, out to ground stations and other aircraft, allowing controllers to separate traffic.

ATC MODERNIZATION

During the summer of 2008, the NAS saw a record number of delays. Government and industry worked together to implement a series of programs to reduce delays. These programs have had some effect in reducing delays, but more work is needed. Air traffic congestion in flight and on the ground remains a major issue, indeed the crux of the problem. There are physical limits in time and space of capacity, and a major impediment is the ground infrastructure, i.e. concrete runways, taxiways, aprons, and buildings. Each new runway takes an average of over 10 years to design and build and costs billions of dollars. The impacts of noise and pollution regulations are forcing the cost even higher.

Airlines have been forced to increase the scheduled time between departing the gate and arriving at the destination gate. The flight of a propeller driven Douglas DC-7 in the 1950's between Dallas and Atlanta had a shorter *scheduled* time than does a flight today in a Boeing 757. The extra time is necessary to navigate on the ground to and from the runway. At some airports, airlines routinely allocate over 70 minutes just to get from the departure gate to the runway.

Increased airport surface congestion increases the chances of runway incursions and possible collisions. Ground delays cost more than just the extra time. Time delayed due to congestion adds costs for fuel, wear and tear on aircraft, follow on schedule disruptions for crews and aircraft and so forth that collectively amount to billions of nonproductive dollars annually lost due to sitting in traffic.

Industry and government must collaborate on a series of efforts to reduce the challenges of airport surface management, including the use of ADS-B, previously discussed, for increased surface situational awareness for both pilots and controllers. The collaborative use of flight data such as departure time of a flight from the gate and the estimated time before a flight will touchdown can be used by the airport, air traffic control, and airline managers to more effectively and dynamically manage the surface traffic of aircraft and ground vehicles.

The potential benefits of more effective surface management are tremendous. With the rising cost of fuel, less fuel will be consumed taxiing resulting in immediate savings. Reduced taxi time also translates into less noise and emissions. Better knowledge of exactly where the aircraft is on the surface translates into more efficient gate management and will allow the air traffic controller to arrange departures into a more efficient departure stream.

NextGen is the plan — but an architect's plans tend to work out best when the people building the house are actively engaged with the planners. That is the approach that will sustain the forward momentum if we're to achieve success.

Looking at the situation broadly, we face a number of key challenges: We know that the demand for air transportation will grow in the long term. We know that safety, security, and national defense must be sustained, but "improved" is probably a better word to use there. It is not a zero sum game. Aviation's environmental footprint will need to shrink, and tackling the energy costs that are rippling through the system today is essential. Done wisely it will trigger a reduction of operating costs and hopefully increase profitability.

A critical decision in all this will revolve around the aircraft capabilities needed for NextGen success. When it comes to looking at equipage, we've got to start with the airplane. Aircraft capabilities are essential to NextGen. As we've learned from too many of the start-and-stop modernization plans of the past, decisions to implement new avionics-enabled capabilities must be made by industry and government together. And both sides need to be clear on what they're buying into and what return on investment they can achieve. Clarity on proposed aircraft capabilities is especially important and especially challenging. These must be vetted, refined and matured by the aviation community.

The good news here is that many of NextGen's capabilities are already on aircraft now. We've got to build on that success. It is essential that the capabilities selected for NextGen evolve from the capabilities of today. They've got to be both clearly justified and cost-effective.

Given the national significance of these challenges, partnership has to be the order of the day. And everyone must weigh in. Potential capabilities only turn into system performance when both sides make the required investment. Certainly aircraft operators will play a decisive role in the resolution of these challenges. The operators must make focused investments in the key

aircraft equipment enablers required to deliver operational capabilities that are going to enable NextGen — including the avionics and other aircraft performance requirements. And operators must have some real assurance not just wishful thinking — that the investments they make in new aircraft and avionics will pay-off.

We need to define exactly how the NAS could operate in 2018. We need to be able to explain how data link, ADS-B, RNP and other existing systems will work together to make things better than they are right now. And most importantly, we need to understand from operators how these systems can translate into business performance. After all, an industry that makes money can invest and upgrade faster than one simply seeking to survive.

An example of this is the new En Route Automation Modernization (ERAM). ERAM is the replacement for the existing host computer for en route centers. ERAM was designed with NextGen in mind. It will support satellite-based systems, such as ADS-B, and data communication technologies. This, in turn, will clear the way for future gains in efficiency and safety. ERAM will begin installations in the 20 air route traffic control centers (ARTCCs) in the next couple of months.

ERAM includes a fully functional backup system and precludes the need to restrict operations in the event of a primary system failure. The backup system also provides safety alerts and weather information not available on today's backup system. ERAM has increased flexibility in routing around congestion, weather and other airspace restrictions. Automatic flight coordination increases efficiency and capacity.

A fully developed NextGen could eliminate as much as 15% of today's delays, increase safety and capacity, and concurrently reduce emissions. Funding of important research activities like wake vortex studies are critical to that full development. More information about and understanding of wake vortex patterns around runways will allow spacing of traffic on the runway based on real hazards – a more accurate standard than the currently used mileage separation. It is critical to continue funding for important infrastructure improvements including runway and taxiway additions and improvements. Poor airport design, including those with intersecting runways, increases taxi time and increases fuel use. Adding high-speed taxiway exits from runways can reduce runway occupancy time thus increasing airport capacity. Additional runways, like those recently commissioned at Seattle-Tacoma, Chicago O'Hare and Washington Dulles airports, reduce fuel wasted in holding patterns and long lines of aircraft waiting for take-off.

Unmanned Aerial Systems (UAS)

The need to modernize extends beyond simply upgrading today's ground and airborne equipment. New concepts and new technology must be integrated. Among the most dramatic changes in technology is the Unmanned Aerial System (UAS). The introduction of UAS to the NAS is a challenging enterprise for the FAA and the aviation community. UAS proponents have a growing interest in expediting access to the NAS. There is an increase in the number and scope of UAS flights in an already busy NAS. The design of many UASs makes them difficult

to see, and adequate "detect, sense and avoid" technology is years away. Decisions being made about UAS airworthiness and operational requirements must fully address safety implications of UASs flying in, around, or over the same airspace as manned aircraft, and perhaps more importantly, aircraft with passengers who have come to expect a single level of safety that is the highest in the world.

UAS are aircraft that range in size from as small as a bird, to as large as a Boeing 737. They are flown remotely from an operational center or control stations that can be located at the launch and recovery site or thousands of miles away. Some are capable of "autonomous operation" meaning they follow pre-programmed instructions without direct operator control. Their pilots/operators are not currently required to be FAA licensed pilots or even have a common level of proficiency. Most of the current designs were developed for the Department of Defense (DoD) for use in combat areas and so are not necessarily designed, built, maintained or operated in the same manner as other aircraft in the National Airspace System. As a result, today they are typically flown in segregated airspace, i.e. military restricted airspace or equivalent, but have the clear potential to stray into our airspace in the event of a malfunction.

The UAS industry is currently focused on the rapidly growing DoD UAS application but is moving toward adapting current UAS to civil use. There is growing pressure by the UAS industry to gain access to the NAS as for commercial applications. In order to guarantee an "equivalent level of safety" for UAS in the NAS, extensive study of all potential hazards and ways to mitigate those hazards must be undertaken. The pressure for rapid integration into the NAS must not result in incomplete safety analyses prior to any authorization to operate.

The much-publicized success of UAS in combat operations has created a large potential market for the use of these aircraft by commercial enterprises. Many are also in use domestically by government agencies (law enforcement, customs, agriculture, etc). As the number of these aircraft increase, and the potential for business use increases, so does pressure to allow their unrestricted operation in the NAS. Currently, they are operated in exclusionary airspace and not in the common areas. Before UAS can be authorized to occupy the same airspace as airlines, or operate in areas where UAS might inadvertently stray into airspace used by commercial flights, there needs to be in place a standard or combination of standards that will ensure the same high level of safety as is currently present in the NAS. We can not afford to misjudge this issue in the name of profits.

ALPA believes that in all types of aviation, a well-trained and experienced pilot is the most important safety component of the commercial aviation system. The role of the pilot is a major area of concern within the UAS and piloted aircraft communities. These pilots should be trained, qualified, and monitored to the same standards as pilots that operate aircraft from within the aircraft. ALPA will continue to work to protect the safety and integrity of the NAS and ensure the introduction of UAS operations will not compromise the safety of our members, passengers, cargo or the public at large.

ALPA is in full support of the former FAA Associate Administrator for Aviation Safety Mr. Nick Sabatini, when he said "that UAS should do no harm," when referring to their potential integration into the NAS. The standards for design, construction, maintenance and operation of

UAS must be developed to the point where they operate with the same high level of safety we all expect of commercial aviation before they are allowed unrestricted access to the NAS.

ENVIRONMENTAL CONSIDERATIONS

Aviation in the United States is a vital part of the economy, providing millions of jobs, linking our communities and the world, and making commerce possible. All U.S. aviation combined contributes only about 3 percent of U.S. greenhouse gas (GHG) emissions, and has vastly improved the efficiency of airplanes even as passenger and cargo traffic has grown six-fold over the past 40 years. The industry is committed to address its role in climate change, but progress requires government as an active partner. Environmental concerns have become a competitive weapon between the airlines of North America and those in Europe. Europe is attempting to adopt environmental standards that place the US at an economic disadvantage by not giving aviation credit for technological and operational developments that have reduced aviations GHG emissions.

ALPA's ongoing efforts are focused on ensuring that the aviation industry remains safe and is positioned to recover economically as we address environmental challenges. As our industry seeks to leverage new tools and technologies to help address climate change, airline pilots have a unique perspective from the cockpit. We know what will work and what won't when pilots fly the line. ALPA will remain engaged every step of the way.

In 2008, ALPA called for a comprehensive National energy policy that reduces fuel prices and volatility by controlling rampant speculation, recognizes aviation's contributions to conservation, continues the use of carbon-based fuels without increasing the industry's tax burden, and supports new technology. ALPA's leaders also urged creation of a transportation policy that fosters a viable and functional airline industry and protects the long-term interests of the public and all airline employees.

Strong national policy on energy and transportation is the true solution for the airline industry and the environment. ALPA will continue to work on a bipartisan basis with the U.S. Congress and the Administration to craft a national energy and transportation policy to put our industry—and our country—on the path to sustainability.

A former FAA Administrator and others have dubbed ALPA the "conscience of the airline industry" and, in that role, we take very seriously the need to ensure that any new operational measures are fully understood and thoroughly considered before implementation. Pilots have a unique vantage point to see and experience firsthand what well-intended, but unrealistic operational procedures can do to safety margins.

Another principal reason for our interest in this subject is the need to ensure the ongoing viability, what we call the sustainability, of our airline industry. We recognize all too well that our employers are under tremendous financial stress due to the record high cost of fuel and pressures from environmental concerns to reduce fuel consumption and corresponding emissions. Pilots have a genuine ability to help their airlines burn less fuel, and thereby put less

noise and tailpipe emissions into the environment. Pilots look for opportunities to reduce fuel burn and do so every day.

Pilots and the airline industry as a whole have already made great strides toward reducing total fuel burn, noise, and tailpipe emissions. We believe Congress should take this into account when it considers any legislation regarding greenhouse gas (GHG) emissions. Our employers have made extraordinary investments to reduce consumption and pollution. When oil peaked near $140 per barrel, airlines parked airplanes because they could no longer afford to fly them, name-brand legacy carriers looked for mergers in order to survive, airlines were spending about 40% of their revenues on fuel, and airline pilots faced an uncertain future in an industry made unstable because of this energy crisis. In 2008, four ALPA air carriers shut down entirely and more than 14,000 airline jobs were eliminated.

Airlines and aviation face unique challenges concerning fuel efficiency and reduction of emissions. First are the long and expensive lead times for the research, development, design, and certification implementation for new technologies. Second is the lack of any economically viable alternative to fossil-based fuel for our aircraft. Compounding these issues is the lack of a comprehensive national energy policy that addresses the short and long term needs of our transportation systems.

Airline pilots can, and do, save fuel and emissions through our companies' operating procedures. Safety is our utmost concern, of course, but where safety is not impacted, airline pilots will reduce fuel usage through such measures as:

- Outbound taxi with fewer than all engines operating – Under certain conditions, it is not necessary that all aircraft engines be operated to taxi on the ramp or on taxiways. When conditions permit, starting one engine (or more on some aircraft) may be delayed until reaching the end of the runway for takeoff.

- Engine shut-down during inbound taxi – Once the aircraft has exited the landing runway and is headed to the gate or parking stand, one or more operating engines may be shut down either in the taxiway environment or on the ramp.

- Technology enhanced departure procedures – New procedures are being developed with the aid of Area Navigation (RNAV) and Required Navigation Performance (RNP) technology which permit shortening the distance and time traveled during approach and departure.

- Optimal altitude – Each jet aircraft, based on weight and ambient conditions, has an optimum altitude where fuel burn is minimized. To the extent that conditions and circumstances permit, pilots may request that optimal altitude in order to conserve fuel, which reduces emissions. The concepts embodied in NextGen increase the likelihood of these optimal altitudes being flown.

- Optimal-speed flight plans – Planning and operating a flight at an efficient speed can save fuel. Pilots can optimize fuel burn based on aircraft weight, winds, and atmospheric conditions.

- Continuous Descent Arrival (CDA)/Optimized Descent Procedure (OPD) – Normal approach and landing procedures require an aircraft to reduce power, descend to a new altitude, and then add considerable power to level off and fly straight and level – that process may be repeated several times during any approach and landing. A new procedure discussed in NextGen planning, the Continuous Descent Arrival, CDA, or what we sometimes refer to as an Optimized Profile Descent, OPD, is being explored. This concept permits pilots to reduce power on all engines and not use significant thrust until establishing a stabilized approach configuration just before landing. This procedure cannot work at all airports at all times due to operational constraints, but at those locations where it can be used, it can save substantial fuel on a single approach.

- Reduced Vertical Separation Minimum (RVSM) – Taking advantage of improved technology, appropriately equipped aircraft can now fly with 1,000 feet – compared with 2,000 feet previously – vertical separation at higher altitudes. This operational change added six additional useable altitudes increasing the opportunity for pilots to fly their aircraft at the optimal, most fuel efficient altitude, in addition to permitting much greater airspace utilization.

We as pilots do not design the aircraft, make the decision on which aircraft to fly or to what destinations. Our employers do that. We are, however, the ones who, by operating in the most cost efficient manner consistent with safe practices, also operate with the least environmental impact.

The aviation industry arguably has the most successful record of limiting its impact on the environment while increasing its productivity of any industrial sector. Airlines have greatly reduced carbon based emissions through engine technology which reduces fuel burn and production of undesirable gases and particulates. Compared to aircraft in use in 1972, the U.S. airline industry now carries six (6) times more payload using 60% less fuel and has reduced by 95% the number of people significantly impacted by aircraft noise. This outstanding record of environmental achievement has resulted almost entirely from the airlines continually demanding new aircraft from the manufacturers that burn less fuel, carry greater payloads, and create less noise. Boeing is preparing for the first flight of the B-787; due to its cutting edge technology, that aircraft is designed to use 20% less fuel – and thereby create 20% less GHG emissions – than current aircraft of the same size. This aircraft is just one example of the kinds of investments that the airlines make in a very heavily capitalized industry; those investments should be taken into account by any legislation that deals with fuel conservation and GHG emissions.

The government should give greater support to research for alternative fuels which are renewable, pollute less or not at all, and are less expensive than today's fuels. Because of aircraft engine design and extreme atmospheric conditions at altitude, the airline industry relies

entirely on petroleum-based jet fuel; it cannot substitute ethanol or other fuels as some industries are able to do.

We call on Congress to avoid adding any economic burdens, in the form of market-based measures, to an already crippled industry. Such measures as planned to take effect in Europe and as were proposed in the Lieberman-Warner bill last year are biased against the airline industry and do not provide sufficient re-investment of revenue for new aviation technologies and fuel. These carbon cap-and-trade schemes are designed to provide an economic incentive to reduce emissions – our industry already has that incentive and is continually searching for more ways to reduce fuel use and emissions. Diverting funds needed for new, more fuel efficient aircraft and alternative fuels research will only slow these efforts. We need to continue to work with the International Civil Aviation Organization (ICAO) to establish real global emissions standards and operating measures for uniform application across this global industry.

Aviation is a good news story; we safely move hundreds of millions of passengers around the world in comfort, at great speed, and with less impact on the environment than any other mode of transportation in history. However, aviation is a visible target and has drawn the attention of numerous groups around the world who condemn the industry for being a driver of projected climate change.

As pilots, we deal with facts, and the facts clearly show that while aviation is a contributor of greenhouse gas and other emissions, it plays a very small role in the overall issue. Indeed, we could ground the entire world's fleets, and not have a significant effect on the climate change issue. The industry is poised to make great strides in reducing emissions through technology and operating procedures. We believe that the best way to achieve those results is the same way that we have made such great advances thus far, namely, through industry's investments in increasingly advanced technology.

SUMMARY

NextGen has the potential to revolutionize the NAS and our air transportation system, but only if private industry and government work together. By collaborating, we have made major strides in the almost 102 years since the Wright Brothers first flew. However, the next 20 years could see major changes in aviation. Forecasted increases in air traffic of two to three times today's traffic can not be met in today's NAS. The changes will be not be cheap or easy and will require much work and effort. As a member of the NextGen Institute, ALPA looks forward to collaborating with industry, academia, and government to meet these challenges.

As 9/11 showed, the air transportation system is a vital driver of our economy. With the number of flights and passengers in the next 20 years forecasted to increase by a factor of two to three, industry and government must once again collaborate to build NextGen. Neither industry nor government can afford to attempt, or are capable of completing, this enormous undertaking alone.

Any measures to address NextGen's Near-term Achievable Goals should be based on the following principles:

- **Air traffic control (ATC) modernization:** The Administration and Congress should work to accelerate the FAA's NextGen plan to modernize our antiquated ATC, communications, navigation, surveillance and management infrastructure; this is vital to safety and efficiency and can bring significant reductions in GHG emissions.

- **Technology and research:** Industry is driven by customer demand and market forces to develop and deploy improvements to the NAS, aircraft, and engines.

- **Alternative fuels:** Industry is partnering with government to drive the research, development and deployment of commercially viable, environmentally friendly alternative jet fuels as well as an unleaded fuel for general aviation.

- **Operational measures:** Aviation has vastly increased the efficiency of its operations to minimize GHG emissions; widespread use of GHG-saving navigation procedures such as continuous descent arrivals (CDA) or as they are also known, Optimized Profile Descents (OPD) awaits ATC modernization.

- **Ground infrastructure investment:** More infrastructure investment is required to address shortcomings at our busiest airports and improve operational efficiency.

- **Economic measures:** Positive incentives can add to the industry's efforts, but fees, charges or taxes, whether direct or indirect, are counterproductive. Should any climate change measures raise revenues, such revenues must be reinvested into initiatives that reduce aviation's GHG emissions.

We must have a plan that offers a systematic approach that builds on better science and improved decision support tools, advanced air traffic procedures, enhanced aircraft technology, sustainable alternative fuels, and policies to address environmental challenges. Advances in aircraft technology and renewable fuels are essential if we are to provide solutions for the energy and climate challenges for the U.S. aviation system. The close partner to this sustainable development is livability, the fourth area of this Administration's priorities. In aviation, this entails a commitment to the flying public to continue to focus on the safety, convenience, and confidence of the traveling public, with minimal environmental impacts on our communities.