### 1AC

#### OI. The story of the status quo

#### The status quo has recognized the need to address air traffic control issues - however, new projects, such as NextGen, are not being funded. The delays in rolling out this project will actually gut the program from ever being implemented

Hoover, senior editor for InformationWeek Government*,* 2011 [J. Nicholas, "Problems plague FAA's NextGen air traffic control upgrade", InformationWeek Government, <http://www.informationweek.com/news/government/info-management/231900067>] ttate/foster/cass

The Federal Aviation Administration continues to struggle with budgets, deadlines, and management of its multi-billion dollar upgrades to the nation's air traffic control systems, government officials and industry executives told Congress on Wednesday.

The long-term, multi-stage NextGen effort, which has been underway for several years and isn't slated to be complete until approximately 2025, aims to improve American aviation by upgrading numerous Cold War-era flight systems. But the effort has long suffered problems.

Within the last couple of years, the FAA has instituted a number of changes to improve NextGen's management, including working closely with an advisory group made up of users and other constituents, changing the NextGen program so that it directly reports to the FAA's deputy administrator, and centralized program management for the effort.

However, ongoing problems continue to threaten the program's costs and timeline and have kept private industry in the dark about the program's benefits and schedule, the officials and executives told the House Transportation and Infrastructure Committee.

As a result, according to Lee Moak, president of the Air Line Pilots Association, a group that represents the interests of 53,000 pilots, and Ed Bolen, president and CEO of the National Business Aviation Association, manufacturers are building and delivering future-proofed planes and carriers are putting new processes in place but can't take advantage of all their capabilities because of delays in or improper management of NextGen.

For example, numerous carriers are ready to adopt procedures that they co-developed with the FAA to provide "smooth, fuel efficient, low emission descents that reduce [the need for] communications and enhance safety during good weather conditions" and others that help out in poor weather conditions, Bolen said. But the FAA doesn't even have plans or approval processes to permit planes to follow these procedures even as jet fuel costs continue to rise.

In another case, the En Route Automatic Modernization (ERAM) system, a computer system to provide communications and generate display data for air traffic controllers, is about 5 years behind schedule and as much as $500 million over budget, according to a study by Mitre Corp.

According to FAA Inspector General Calvin Scovel, early testing of ERAM revealed problems with safety management, and controllers had to rely on cumbersome workarounds to overcome those issues. That problem snowballed. "ERAM's problems are the direct result of poor program management," Scovel said. "There was over-optimism that ERAM could be deployed in a year, and FAA didn't begin to mitigate some risks until three years after problems began surfacing. This was a program that was hobbled out of the gate." Even with all those problems, and despite the significant program risks, the FAA still hasn't conducted an assessment of ERAM's dependencies or impacts on other program costs.

At a higher level, Scovel noted, the FAA has yet to develop an integrated master schedule to help manage NextGen, meaning that "programs are left with no clear end state."

The officials and executives pointed to a number of causes for the delays and cost overruns, including unstable requirements, poor program and contract management, the inability of the FAA to bring all constituents into the decision-making process, training, and a lack of communication.

Now, added to that list might be the fiscal environment. Amidst all the turbulence, Congress is considering slashing spending at the Federal Aviation Administration between 5% and 10%, which could further delay implementation of some pieces of NextGen.

"There's no question that reduced funding will cause delays, and that the delays will cost us more in the end in terms of lost benefits as well as increased costs of deployment," FAA deputy administrator Michael Huerta told legislators, adding that Congress should fund the FAA to the levels suggested by President Obama. "In the end, to be able to meet the timeline set out, the President's funding level is really what we need to get us there."

The government has already spent nearly $3 billion on NextGen, and the effort will likely cost into the tens of billions of dollars. By 2018, the FAA estimates that, thanks to NextGen, airlines will see a 35% improvement in delays and save more than a billion gallons of fuel. However, with continued problems and looming budget cuts, those numbers may be hard to reach.

#### And, the airline industry is near brink of collapse - 2011 reported decade-low flights and profit losses

Reuters 02-24-12,http://www.reuters.com/article/2012/02/14/us-usa-airlines-departures-idUSTRE81D21220120214, “Flights by U.S. airlines hit 10-year low”,2/14/12, international news agency.

(Reuters) - U.S. airlines in 2011 operated the fewest number of flights since the hijack attacks on New York and Washington depressed air travel and accelerated the industry's worst-ever financial downturn, government figures on Tuesday showed.¶ The Transportation Department said major airlines, their chief low-cost competitors and the biggest regional carriers, recorded 6.08 million departures last year. Takeoffs were not that low since 2002, when they totaled 5.27 million.¶ Reduced operations and good summer weather, especially in the East, helped airlines post a 79 percent on-time rating in 2011, unchanged from the previous two years.¶ The overall number of flights by U.S. airlines have steadily declined since 2008 when the recession dampened travel demand. Most recently, stubbornly high fuel prices have prompted airlines to further cut capacity to reduce costs and maintain higher fares.¶ The industry operating figures were released as President Barack Obama signed into law $63 billion legislation authorizing guaranteed funding of the Federal Aviation Administration (FAA) through 2015.¶ The FAA oversees U.S. air traffic operations at more than 400 airports.¶ The measure approved by Congress last week also includes funding for the next steps in transforming the air traffic network from a radar-based system to one relying on satellites.

### 1AC - Plan Text

The United States Federal Goverment should substantially invest to fully fund the Next Generation Air Traffic Management System.

### 1AC - Economy Advantage

#### Advantage I - The Economy

#### First, the US airline system is headed for an inevitable crash - passenger and cargo demand will continue to overload the out-dated system - modernization is needed to keep the airline industry afloat

Global Business Travel Association(GBTA) 12, [GBTA organization that promotes the value of business travel management.”NextGen Air Traffic Control Modernization”, <https://www.gbta.org/usa/governmentrelations/Pages/NextGenAirTrafficControlModernization.aspx>] jeong/foster

The Issue: The nation’s air traffic control (ATC) system, based on 1940’s era radar, is inefficient and inadequate to meet growing demand. In the next few years, more passengers and aircraft will tax further an already overloaded system. With approximately 720 million passengers in 2011, FAA projects a billion passengers-per-year will be flying by 2021, increasing chokepoints and flight delays in already heavily congested airspace. Without continuing modernization, the increasingly inefficient ATC system will suffer gridlock in severe weather and business travelers will pay a steep price. NextGen is comprehensive ATC modernization using a Global Positioning System (GPS) built on reliable satellite-based navigation. GPS and other sophisticated technologies/flight procedures will reduce flight delays, flight times and aircraft fuel burn/emissions. *NextGen* will help business travelers get to their destinations on time and avoid lost opportunities. FAA projects that by 2018, NextGen will reduce flight delays by 35% and provide $23 billion in delay reduction benefits. In a 2011 business case study, Deloitte estimates $29 billion in net benefits in the U.S. each year of full system deployment, beginning in 2026. GBTA Position: GBTA supports initiatives to accelerate ATC modernization as a modern, safe air infrastructure is essential to the business travel industry. Accelerating NextGen means business travelers will see fewer flight delays in the next few years, rather than ten years from now. Congress must approve the Administration’s proposed 11 percent increase in *NextGen* funding in the Fiscal Year 2013 Budget Request and the FAA must remain focused on achieving measureable benefits. In addition, strong agency leadership is essential to strengthen the management, oversight and implementation programs.

#### And, we will isolate several internal links to stimulating the economy:

#### First is billions in delays costs and loss of productivity - the current inadequacies of our air traffic control system is costing the US economy billions of dollars each year in delay costs and productivity losses from delays - delays will only continue to worsen in the status quo

Schumer and Maloney 08 (JOINT ECONOMIC COMMITTEE MAJORITY STAFF CHAIRMAN, SENATOR CHARLES E. SCHUMER VICE CHAIR, REP. CAROLYN B. MALONEY, “FLIGHT DELAYS COST PASSENGERS, AIRLINES, AND THE U.S. ECONOMY BILLIONS”, May 2008, AD: 07/09/12, <http://www.jec.senate.gov/public/?a=Files.Serve&File_id=47e8d8a7-661d-4e6b-ae72-0f1831dd1207> | Kushal)

The economic costs of air traffic delays to the U.S. economy are large and far-reaching. As air traffic has grown over the last two decades, the number of domestic flights and air flight delays has reached record levels. Increasing flight delays and cancellations are placing a significant strain on the U.S. air travel system and costing both passengers and airlines billions of dollars each year. For this report, the majority staff of the Joint Economic Committee (JEC) used U.S. Department of Transportation data to analyze more than 10 million individual U.S. domestic scheduled flights in 2007. These passenger flights were operated by more than 400 different carriers – both national and regional – and traveled through more than 1,100 airports. The JEC found that: The total cost of domestic air traffic delays to the U.S. economy was as much as $41 billion for 2007. Air-traffic delays raised airlines' operating costs by $19 billion. With each delayed flight, airlines paid extra for crew, fuel, and maintenance costs while planes sat idle at the gate or circled in holding patterns. Delays cost passengers time worth up to $12 billion. Delayed travelers, their employers, and others lost productivity, business opportunities and leisure activities when air travel took extra time. Costs cascaded when delayed flights resulted in other late flights. These costs to passengers could be even higher than JEC estimates, as a result of missed connections, cancelled flights, disrupted ground travel plans, forgone pre-paid hotel accommodations, and missed vacation times. Indirect costs of delay to other industries added roughly $10 billion to the total burden. In particular, industries that rely on air traffic, such as food service, lodging, general retail, and public transportation suffered. Delayed flights consumed about 740 million additional gallons of jet fuel. Delayed flights cost the airlines (and customers) an additional $1.6 billion in fuels costs, assuming an average wholesale price of $2.15 per gallon in 2007. Burning fuel during flight delays released an additional 7.1 million metric tons of climate-disrupting carbon dioxide into the atmosphere. Almost 20 percent of total domestic flight time in 2007 was wasted in delay. In 2007, flight arrivals were delayed by a total of 4.3 million hours, after accounting for padding in airline schedules. These delays cost travelers 320 million hours of lost time delays**.** Planes arrived later than their scheduled arrival by more than 2.8 million total hours; however, because airlines have built the most predictable delays into their schedules calculating delays with respects to schedules significantly underestimates the problem. In fact, when padding is removed from the analysis, total delays are actually 57 percent higher than the airlines report. 1 EXECUTIVE SUMMARYJOINT ECONOMIC COMMITTEE MAY 2008Flight delays were longest during months when many people take vacations. Flight delays during the months of June, July and August – popular vacation months – averaged approximately 414,000 total hours of delay per month. Flights during December – the height of holiday traveling – totaled almost 438,000 hours of delay. Seventy-eight percent of flight delays in 2007 occurred before take-off. Almost 60 percent of flight delays occurred at the gate, and 20 percent of delays occurred during the taxi to the runway. Airborne delays, the most costly for airlines accounted for 15 percent of all delays. Delays at the nation’s largest airports disproportionately contributed to total passenger delays in 2007. Flights to and from the 35 largest U.S. airports accounted for about half of the total passenger delays, even though flights in and out of these airports accounted for only 33 percent of the flights in this study. Passengers departing from airports in the Northeast and Midwest experienced the longest per passenger delays. Certainly, some air traffic delay is unavoidable. Flights can and should be delayed if safety issues arise due to severe weather or mechanical problems. However the staggering levels of delays experienced in 2007 and the significant costs these delays had on the U.S. economy are troublesome. As air travel is expected to increase – the Federal Aviation Administration forecasts that the number of U.S. air travelers will grow by at least 2.7 percent per year through 2025, from more than 689 million passengers today to more than 1.1 billion in 2025 – delays will continue to worsen without important reforms to the system.

#### Second is survival of the airline industry and job growth - NextGen stabilizes aviation industry and stimulates job growth - plan represents 11% of US GDP

Meehan 12,(Patrick, US Rep (PA 07), “Meehan Says NextGen Air Traffic Control Investment Key to Regional Economy”, 2/14/12, AD: 07/09/12, <http://meehan.house.gov/latest-news/meehan-says-nextgen-air-traffic-control-investment-key-to-regional-economy/> | Kushal)

PHILADELPHIA – U.S. Rep. Patrick Meehan (PA-07) today urged President Obama to sign the Federal Aviation Administration reauthorization bill, saying key investments in the bill like the NextGen air traffic control system will boost our regional economy and improve the safety of our skies. Meehan made the comments while touring the air traffic control tower and meeting with controllers at the Philadelphia International Airport. VIDEO: Watch Rep. Meehan discuss FAA reauthorization and NextGen technology. Meehan, a member of the House Aviation Subcommittee of the Transportation and Infrastructure Committee, was joined by Don Chapman, a facility representative with the National Air Traffic Controllers Association, and Mark Gale, CEO of the Philadelphia International Airport. “This bipartisan bill means faster and safer travel, lower emissions, and an increase in private sector jobs,” said Meehan. “It will also advance badly needed modernization of our air traffic control system, which is essential in our congested mid-Atlantic airspace that sees one out of every six flights in the world. This is particularly important here at Philadelphia International – no airport in the northeast sees more takeoffs and landings.” Meehan said the FAA reauthorization legislation will advance the modernization of the country’s air traffic control system to a GPS-based system known as NextGen. This will help ease congestion, decrease delay times and reduce fuel waste. NextGen technologies are expected to bring a net $281 billion to the overall U.S. economy. The FAA authorization bill contains no earmarks and does not raises taxes or passenger facility charges. The bill provides long-term stability for the aviation industry, which accounts for $1.3 trillion in economic activity, and as much as 11 percent of GDP. The FAA authorization law expired five years ago and is currently on its 23rd short-term extension. The bill, which authorizes funding for four years, has been passed by the House and Senate and is awaiting signature from the President.

#### Next is the competitiveness internal link - airport congestion crushes US competitiveness

Schank 06-23-2012 [Joshua - President and CEO @ Eno Center for Transportation, http://www.enotrans.org/eno-brief/the-federal-role-in-transportation-four-ideas-for-greater-federal-involvement] ttate

We often think of airports as local economic generators, and they are that, but some also have substantial national importance. The aviation network is dependent on large hub airports for the efficient and timely movement of passengers across the country and the world. A safe and reliable aviation network is essential for maintaining our competitiveness in the global economy. Unfortunately, we are in danger of losing our edge in this area because of congestion. Successful NextGen implementation could greatly alleviate the problem, but even if that happens airlines could take advantage of the new capacity and provide more frequent flights. Once economic growth picks up again we are likely to see airport congestion and delays increase as well. Airports such as Newark, San Francisco, and Chicago O’Hare already have approximately 30-40 percent of their flights delayed. Airports face substantial challenges in trying to tackle this issue on their own. The most widely recommended solution is pricing airport runways by time of day. But this politically unpopular solution has faced substantial opposition from communities such as smaller cities flying into hubs, or general aviation aircraft that are concerned about being effectively priced out of the market for a given airport. Congested airports would have a much greater chance of success if they were trying to tackle congestion in partnership with the federal government and other local transportation agencies. The federal role could be improved by dedicating a portion of the Airport Improvement Program (AIP) to provide grants to airports in regions that have a plan to work collaboratively to reduce congestion and overcome some of the political barriers to more effective pricing. Or the AIP could be retooled to set specific performance goals for airports and rewarding achievement. However it is done, there is a clear national interest at play here and the federal government needs to be more involved.

#### **And, Next Gen is key to revitalizing our airline industry - every year that delay implementation will cost our economy $40 billion - plan more than pays for itself**

Dave Hess 11,http://articles.courant.com/2011-09-27/news/hc-op-hess-nextgen-0927-20110927\_1\_air-traffic-radar-air-routes,Modern Air Control Vital To Economy, Jobs, 9/27/11, editor at the Hartford Courant jeong

As the budget debate rages in Washington, everyone from the president to the most conservative member of Congress should agree we need to cut programs that aren't providing a decent return on our investment and support the ones that bring back more than we put in — those that grow the economy and create jobs. These are decisions that businessmen and women make in companies large and small every day. It's fundamental to long-term success.¶ This basic measure of smart business spending — return on investment — should be the same in government and industry. The challenge often lies in determining where the waste is and what will bring a good return.But with one important program waiting for funding in Congress, there's really no room to disagree — it's plain right now that funding the Next Generation Air Transportation System will bring enormous returns to the U.S. economy for years to come.¶ NextGen will completely replace our World War II-era analog, ground radar-based air traffic control infrastructure with a 21st-century, all digital, satellite-guided system. With an annual federal investment of roughly $1 billion, NextGen is on time and under budget and will produce economic and environmental benefits that will more than pay for the cost of the program less than three years after it's fully implemented.¶ According to independent experts at the Deloitte firm, this small investment will yield nearly $300 billion in U.S. economic benefits over the next 25 years. Furthermore, every year before its completion will cost our economy roughly $40 billion in air traffic delays, wasted fuel and lost productivity.¶ Unfortunately, I don't think most Americans know what NextGen is. We tend to focus on roads, rail and ports when we talk about transportation infrastructure. Yet, in a world increasingly dependent on international commerce and coast-to-coast travel, speedy, reliable air transportation is just as important. And as safe as air travel is right now, the NextGen overhaul will make it even safer, more efficient and more environmentally friendly.¶ It's almost unbelievable, but 50,000 flights a day in the U.S. are controlled much the same as they were in 1960 — by World War II-era ground radar stations. Today's air routes follow radio beacons installed in the very spots where bonfires guided Lindberg-era airmail pilots in the 1930s.¶ NextGen will use precision satellite technology for navigation and surveillance, allowing planes to safely fly closer together. NextGen will enable pilots to choose more direct routes, no longer limiting them to zigzagging between ground-based radar stations. The results? Safer and more efficient flights, fewer weather delays and reduced emissions and noise.¶ The 793 ground transceivers that will replace conventional radar by linking controllers and aircraft to global positioning satellites will be in place by 2013. But NextGen cannot work unless commercial airlines and private aircraft that operate in congested space install avionics systems designed to send and receive NextGen data. That equipment, however, isn't required until 2020. That's a seven-year gap with a half-complete system that will cost our economy $35 billion.¶ Collectively, airlines and private aircraft owners will pay billions of dollars to upgrade to NextGen-enabling equipment. Although the future economic and environmental benefits of NextGen are significant, the current economic state of the civil aviation industry makes capital investments difficult. Airborne NextGen equipment is transportation infrastructure for the 21st century. Using the right public-private partnership financial incentives and investments, industry and government can not only finish building NextGen early, but also deliver significant safety, economic and environmental improvements to our national airspace system.

#### And, aviation is the lynchpin of global economic stability - Next Gen is key to preventing collapse

AIA 12 (Aerospace Industries Association, “NextGen: The Future of Flying”, 2012, AD: 07/14/12, <http://www.aia-aerospace.org/assets/brochure_aia_nextgen.pdf> | Kushal)

ECONOMIC –¶ NextGen Provides Economic Stimulus“Aviation is the glue that keeps the global economy together. Without widely accessible and well-priced air travel, the global economy will quickly become less global.” – Moody’s Economy.com¶ Chief Economist Mark Zandi¶ The FAA estimates that by 2018 NextGen will reduce total flight delays by better than 21 percent while providing $22 billion in cumulative benefits to the traveling public, aircraft operators and¶ What is NextGen?¶ The Benefits of NextGen¶  Air travel and shipping will¶ be safer, more reliable and¶ beneficial to the environment.¶  The airspace will accommodate¶ more than two times today’s¶ traffic.¶  Total flight delays will be¶ reduced by up to 21 percent¶ by 2018.¶  Fuel usage will drop by nearly a billion gallons in that period.  Greenhouse gas emissions will¶ be drastically reduced.¶ the FAA. Businesses related to or dependent on aviation risk losing¶ as many as two million jobs every five years if the nation doesn’t¶ implement NextGen.¶ Depending on the pace of investment, NextGen could pay for itself¶ in three years. It would be difficult to match that return on any other¶ infrastructure investment.¶ Civil aviation is an economic engine directly and indirectly contributing more than $1.2 trillion — or 5.6 percent of gross domestic product — to the U.S. economy. It supplies nearly 11 million jobs with a payroll of $369 billion. Civil aviation contributes positively to the U.S.¶ trade balance, creates high paying jobs, keeps just-in-time business¶ models viable and connects all Americans to friends, family and¶ business opportunities.¶ ENVIRONMENT –¶ NextGen Can Reduce Carbon Emissions¶ In 2008, the U.S. Government Accountability Office advocated¶ deployment of NextGen as soon as practicable to realize¶ environmental benefits. NextGen’s efficiencies will reduce noise, fuel consumption and carbon dioxide emissions, as well as other air pollutants. The FAA estimates that full implementation of NextGen could reduce aircraft greenhouse emissions by as much as 12 percent by 2025 — a carbon dioxide reduction equivalent to removing 2.2 million cars from the roads for one year.

#### And, global economic collapse leads to global war

ROYAL 10 [Jedediah - Director of Cooperative Threat Reduction at the U.S. Department of Defense “Economic Integration, Economic Signaling and the Problem of Economic Crises,” in *Economics of War and Peace: Economic, Legal and Political Perspectives*, ed. Goldsmith and Brauer, p. 213-215] ttate

Less intuitive is how periods of economic decline may increase the likelihood of external conflict. Political science literature has contributed a moderate degree of attention to the impact of economic decline and the security and defence behaviour of interdependent states. Research in this vein has been considered at systemic, dyadic and national levels. Several notable contributions follow. First, on the systemic level, Pollins (2008) advances Modelski and Thompson's (1996) work on leadership cycle theory, finding that rhythms in the global economy are associated with the rise and fall of a pre-eminent power and the often bloody transition from one pre-eminent leader to the next. As such, exogenous shocks such as economic crises could usher in a redistribution of relative power (see also Gilpin. 1981) that leads to uncertainty about power balances, increasing the risk of miscalculation (Feaver, 1995). Alternatively, even a relatively certain redistribution of power could lead to a permissive environment for conflict as a rising power may seek to challenge a declining power (Werner. 1999). Separately, Pollins (1996) also shows that global economic cycles combined with parallel leadership cycles impact the likelihood of conflict among major, medium and small powers, although he suggests that the causes and connections between global economic conditions and security conditions remain unknown. Second, on a dyadic level, Copeland's (1996, 2000) theory of trade expectations suggests that 'future expectation of trade' is a significant variable in understanding economic conditions and security behaviour of states. He argues that interdependent states are likely to gain pacific benefits from trade so long as they have an optimistic view of future trade relations. However, if the expectations of future trade decline, particularly for difficult to replace items such as energy resources, the likelihood for conflict increases, as states will be inclined to use force to gain access to those resources. Crises could potentially be the trigger for decreased trade expectations either on its own or because it triggers protectionist moves by interdependent states.4 Third, others have considered the link between economic decline and external armed conflict at a national level. Blomberg and Hess (2002) find a strong correlation between internal conflict and external conflict, particularly during periods of economic downturn. They write: The linkages between internal and external conflict and prosperity are strong and mutually reinforcing. Economic conflict tends to spawn internal conflict, which in turn returns the favour. Moreover, the presence of a recession tends to amplify the extent to which international and external conflicts self-reinforce each other. (Blomberg & Hess, 2002. p. 89) Economic decline has also been linked with an increase in the likelihood of terrorism (Blomberg, Hess, & Weerapana, 2004), which has the capacity to spill across borders and lead to external tensions. Furthermore, crises generally reduce the popularity of a sitting government. “Diversionary theory" suggests that, when facing unpopularity arising from economic decline, sitting governments have increased incentives to fabricate external military conflicts to create a 'rally around the flag' effect. Wang (1996), DeRouen (1995). and Blomberg, Hess, and Thacker (2006) find supporting evidence showing that economic decline and use of force are at least indirectly correlated. Gelpi (1997), Miller (1999), and Kisangani and Pickering (2009) suggest that the tendency towards diversionary tactics are greater for democratic states than autocratic states, due to the fact that democratic leaders are generally more susceptible to being removed from office due to lack of domestic support. DeRouen (2000) has provided evidence showing that periods of weak economic performance in the United States, and thus weak Presidential popularity, are statistically linked to an increase in the use of force. In summary, recent economic scholarship positively correlates economic integration with an increase in the frequency of economic crises, whereas political science scholarship links economic decline with external conflict at systemic, dyadic and national levels.5 This implied connection between integration, crises and armed conflict has not featured prominently in the economic-security debate and deserves more attention. This observation is not contradictory to other perspectives that link economic interdependence with a decrease in the likelihood of external conflict, such as those mentioned in the first paragraph of this chapter. Those studies tend to focus on dyadic interdependence instead of global interdependence and do not specifically consider the occurrence of and conditions created by economic crises. As such, the view presented here should be considered ancillary to those views.

### 1AC - Environment Advantage

#### Advantage \_\_\_\_ - The Environment

#### First, Aviation in the status quo will continue to increase the amount of emissions they contribute to our global footprint

Fleming 9 (Aviation and Climate Change: Aircraft Emissions Expected to Grow, but Technological and Operational Improvements and Government Policies Can Help Control Emissions June 8, 2009 Statement of Susan Fleming, Director, Physical Infrastructure Issues. June 8, 2009 This is a GAO report. LexisNexis.) FOSTER

Many sources, including manufacturing, residential, and transportation sources, emit greenhouse gases that contribute to the accumulation of these gases in the earth's atmosphere. Greenhouse gases disperse and trap heat in the earth's atmosphere. This heat-trapping effect, known as the greenhouse effect, moderates atmospheric and surface temperatures, keeping the earth warm enough to support life. However, according to the Intergovernmental Panel on Climate Change (IPCC)--a United Nations organization that assesses scientific, technical, and economic information on the effects of climate change--global atmospheric concentrations of these greenhouse gases have increased markedly as a result of human activities over the past 200 years, contributing to a warming of the earth's climate. These trends, if unchecked, could have serious negative effects, such as rising sea levels and coastal flooding worldwide. Aircraft emit a variety of greenhouse and other gases, including carbon dioxide--the most significant greenhouse gas emitted by aircraft--and nitrogen oxides, as well as other substances such as soot and water vapor that are believed to negatively affect the earth's climate. Airlines have a financial incentive to reduce carbon dioxide emissions, as those emissions are a direct result of fuel burn, which represents a large portion of their operating costs--about 30 percent for U.S. airlines in 2008. Some experts expect aviation to grow at a fast rate until 2021, when the Federal Aviation Administration (FAA) forecasts that U.S. domestic commercial aviation will serve over 1 billion passengers a year. While the current economic downturn could delay this growth somewhat, experts believe that growth in the aviation sector means greater productivity and mobility, but is also likely to increase emissions. To counteract expected increases in emissions, many governments and international organizations have set goals for future emissions reductions. For example, a number of developed countries have set a goal to reduce carbon dioxide emissions by 50 percent by 2050. In addition, the Kyoto Protocol, an international agreement to minimize the adverse effects of climate change, set binding targets for the reduction of greenhouse gases for 37 industrialized countries and the European Economic Community (EEC) to achieve during the 2008 through 2012 commitment period.1 Although the United States is a signatory to the Kyoto Protocol, it is not bound by its terms or emissions target because it has not ratified the Protocol. The Protocol also requires industrialized nations and the EEC to pursue "limitations or reduction of emissions of greenhouses gases. . . from aviation. . . working through the International Civil Aviation Organization."2 Finally, some governments have taken actions designed to control aviation emissions. For example, in 2003, the European Union (EU) established a cap-and-trade program known as the EU Emissions Trading Scheme (EU ETS) to control carbon dioxide emissions from various energy and industrial sectors. The EU ETS was first implemented in 2005 and was amended in 2008 to include aviation. Beginning in 2012, the ETS will include all covered flights into or out of an EU airport.

#### And, even though the status quo has taken steps to reduce emissions, increasing air traffic is thumping it - we must find ways to reduce flight paths and delays

GAO 08,Government Accountability Office, http://www.gao.gov/products/GAO-08-706T, "NextGen and Research and Development Are Keys to Reducing Emissions and Their Impact on Health and Climate”, 5/6/8. jeong

Collaboration between the federal government and the aviation industry has led to reductions in aviation emissions, but growing air traffic has partially offset these reductions. The Federal Aviation Administration (FAA), together with the National Aeronautics and Space Administration (NASA), the Environmental Protection Agency (EPA), and others, is working to increase the efficiency, safety, and capacity of the national airspace system and at the same time reduce aviation emissions, in part, by transforming the current air traffic control system to the Next Generation Air Transportation System (NextGen). This effort involves new technologies and air traffic procedures that can reduce aviation emissions and incorporates research and development (R&D) on emissions-reduction technologies. Reducing aviation emissions is important both to minimize their adverse health and environmental effects and to alleviate public concerns about them that could constrain the expansion of airport infrastructure and aviation operations needed to meet demand. This testimony addresses (1) the scope and nature of aviation emissions, (2) the status of selected key federal efforts to reduce aviation emissions, and (3) next steps and challenges in reducing aviation emissions. The testimony updates prior GAO work with FAA data, literature reviews, and interviews with agency officials, industry and environmental stakeholders, and selected experts.¶ Aviation contributes a modest but growing proportion of total U.S. emissions, and these emissions contribute to adverse health and environmental effects. Aircraft and airport operations, including those of service and passenger vehicles, emit ozone and other substances that contribute to local air pollution, as well as carbon dioxide and other greenhouse gases that contribute to climate change. EPA estimates that aviation emissions account for less than 1 percent of local air pollution nationwide and about 2.7 percent of U.S. greenhouse gas emissions, but these emissions are expected to grow as air traffic increases. Two key federal efforts, if implemented effectively, can help to reduce aviation emissions--NextGen initiatives in the near term and research and development over the longer term. For example, NextGen technologies and procedures, such as satellite-based navigation systems, should allow for more direct routing, which could improve fuel efficiency and reduce carbon dioxide emissions. Federal research and development efforts--led by FAA and NASA in collaboration with industry and academia--have achieved significant reductions in aircraft emissions through improved aircraft and engine technologies, and federal officials and aviation experts agree that such efforts are the most effective means of achieving further reductions in the longer term. Federal R&D on aviation emissions also focuses on improving the scientific understanding of aviation emissions and developing lower-emitting aviation fuels. Next steps in reducing aviation emissions include managing NextGen initiatives efficiently; deploying NextGen technologies and procedures as soon as practicable to realize their benefits, including lower emissions levels; and managing a decline in R&D funding, in part, by setting priorities for R&D on NextGen and emissions-reduction technologies. Challenges in reducing aviation emissions include designing aircraft that can simultaneously reduce noise and emissions of air pollutants and greenhouse gases; encouraging financially stressed airlines to purchase more fuel-efficient aircraft and emissions-reduction technologies; addressing the impact on airport expansion of more stringent EPA air quality standards and growing public concerns about the effects of aviation emissions; and responding to proposed domestic and international measures for reducing greenhouse gases that could affect the financial solvency and competitiveness of U.S. airlines.

#### And, the aviation industry is key to our global carbon footprint - this will only continue to rapidly increase if we don't find efficient ways to reduce fuel use

Sebastian and Piltz 07(Thea Sebastian, Research Associate¶ Rick Piltz, Director¶ Climate Science Watch¶ Washington, DC, “NextGen Air Transportation¶ System Progress Reports Ignore¶ Climate Change¶ Evidence”, July 2007, AD: 07/10/12, <http://www.climatesciencewatch.org/file-uploads/NextGen_final_18jul07.pdf> | Kushal)

¶ Aviation Emissions and Atmospheric Warming¶ The impact of aviation on the environment, especially climate change, has been internationally recognized since the Intergovernmental Panel on Climate Change (IPCC)¶ 1999 assessment report, Aviation and the Global Atmosphere.5 Aviation affects¶ atmospheric warming in several ways:¶  First, there is the direct effect of fossil fuel consumption; carbon dioxide is emitted into the atmosphere. However, these emissions (if measured at ground¶ level) are only “a fraction” of an aircraft’s total contribution to climate change.6¶  In addition to carbon dioxide, airplanes also emit water vapor, which adds to¶ atmospheric warming when emitted at high altitude.¶  Finally, they release nitrogen oxide (which causes ozone formation in the upper¶ troposphere), discharge water vapor and soot that lead to the formation of¶ contrails (a variety of cloud that is associated with atmospheric warming) and¶ emit particulates that can lead to an increase in clouds, including high cirrus,¶ which also have a warming impact.¶ Aviation’s Growing Contribution¶ Current estimates of aviation’s contribution to total emissions of greenhouse gases¶ range from 2-3%, but these figures may be conservative. Such data consider only the¶ direct effects of aircraft on fossil fuel emissions. Due to the uncertain state of scientific¶ understanding, they do not include quantification of the “secondary” impact of contrail¶ formation and cirrus cloud cover. In addition, aviation is increasing rapidly. Airbus¶ predicts that global passenger traffic will rise approximately 5.3% per year between 2004¶ and 2023. Boeing, Airbus’ American counterpart, puts that number at 5.2%. Overall, the number of passengers could triple by 2023, and these added flights will greatly enhance¶ the aviation sector’s contribution to climate change.¶ Although the United States has yet to set a concrete goal for carbon dioxide¶ emissions cuts, an emissions cap or carbon tax will likely be a central feature of future¶ U.S. climate change policy. A number of bills that would require major emissions¶ reductions, often on the order of 60-80%, have already been introduced in the current¶ Congress.7 As other sectors decrease their carbon footprint, aviation will take up an increasing percentage of the country’s allotted emissions. In the case of Great Britain, for¶ example, an independent study by the UK Tyndall Center8 found that, if former Prime¶ Minister Blair’s plan for an 80% reduction in carbon dioxide emissions is implemented¶ and, meanwhile, “business-as-usual” growth in aviation continues unconstrained,¶ aviation could consume “close to 100% of (Britain’s) total carbon budget” by 2050.9 This¶ would leave no emissions for any other sector, including cars and trucks, power plants,¶ industry, and residential and commercial buildings.¶ No similar study has been conducted for the United States. Since the IPCC’s¶ Aviation and the Global Atmosphere report,10 the United States has not done any¶ comprehensive analysis of the relationship between aviation and global warming. A¶ NextGen-sponsored June 2006 workshop on the Impacts of Aviation on Climate¶ Change11 took a step in that direction; however, much research remains to be done.

#### NextGen key to solve warming; satellite system saves 24 billion pounds of CO2

Kelly 11(Gary Kelly is the chairman of the board, president and CEO of Southwest Airlines, “We need 21st century air traffic control”, 4/27/11, AD: 07/09/12, <http://money.cnn.com/2011/04/27/news/companies/air-traffic-control-modernization/index.htm> | Kushal/foster)

It's been a tough decade for the U.S. airline industry. Over the past ten years, total financial losses have risen to more than $50 billion. Fuel costs are 4.5 times higher. And, an obsolete air traffic control system exists that contributes to congestion and delays. It's not only been a tough decade -- it's been a lost decade. Once again, escalating fuel prices are having a devastating effect on the airline industry. From the end of 2009 to the end of 2010, the price of jet fuel rose 44 cents per gallon. And, from the end of 2010 to the week ending April 21, the price of jet fuel rose 74 cents per gallon. To put things in perspective, just a penny increase in a gallon of jet fuel costs U.S. airlines $175 million annually. The airline industry, both individually and collectively, has been focused on reducing our dependence on petroleum-derived jet fuel. Our efforts to conserve fuel have focused on three key areas: Modernizing our nation's air traffic control system, including private investments in fuel-efficient technologies; Developing, producing and acquiring the most advanced aircraft engines and airframes; and Developing, certifying, and eventually producing commercially viable alternative jet fuels. Step one must be to develop and deliver a much more direct and efficient satellite-based air traffic control system. The FAA has had a plan called "NextGen" to transform today's antiquated ground-based system to a 21st century satellite-based system. However, the federal government must do more to leverage the technological investments already made by the airline industry so NextGen's benefits -- including greatly improved fuel consumption and reduced emissions -- can be realized much more quickly. It's not an exaggeration to say that today's air traffic control system is using 1950's technology and flight paths to route our aircraft during a time when most drivers on the highway are following direct routes guided by their GPS systems. Today's antiquated, ground-based systems add flight time because they do not route aircraft in a direct, linear fashion. Further, because today's technology does not precisely pinpoint an aircraft's position in space, greater separation must be factored into flight patterns. Utilizing satellite-based systems, the FAA and airlines should be able to route flights more efficiently, precisely, and directly, thereby reducing fuel consumption, as well as flight miles, flight times, congestion, and delays. Additionally, a satellite-based system would: Make a safe system safer and more efficient because everyone shares the same precise view of aircraft in their vicinity; Improve airline and airport operations because of greater scheduling and operating reliability; Increase efficiency and reduce emissions; And, enable the airlines to compete more effectively in the global marketplace. The fuel savings projected from full NextGen implementation are significant and range from 6 to 15 %. Even a 6% fleetwide reduction in fuel burn results in 1.16 billion gallons in fuel savings and nearly 11 million metric tons (24 billion pounds) of carbon dioxide savings. Southwest (LUV, Fortune 500) is the first airline to commit to spending millions of dollars to outfit its entire fleet with a GPS-based, NextGen technology called "Required Navigation Performance" (RNP). To date, we have committed to investing more than $175 million dollars over the next several years to install GPS in our 550 Boeing 737 aircraft and train our 6,000-plus pilots in RNP. But the airlines cannot reach NextGen alone. The FAA, in coordination with the aviation community, must focus its limited resources to design and implement GPS-based flight paths that will result in measurable reductions in fuel consumption and emissions. In other words, it does no good to use new technology to fly the same old routes more precisely. We must have new flight procedures approved by the FAA to leverage the tremendous potential of NextGen technologies. Although it's been discussed since the 1970s, Southwest, along with the entire domestic airline industry, is ready for NextGen now

#### And, warming solves for extinction

Stein 07(David, Science Editor for The Canadian, “Scientists say Humanity ignores Antarctic melting and Greenhouse gas time-bombs with the price of Mass-Extinction”, 2007, AD: 07/10/12, <http://www.agoracosmopolitan.com/home/Frontpage/2007/02/26/01381.html> | Kushal)

Global Warming continues to be approaches by governments as a "luxury" item, rather than a matter of basic human survival. Humanity is being taken to its destruction by a greed-driven elite. These elites, which include 'Big Oil' and other related interests, are intoxicated by "the high" of pursuing ego-driven power, in a comparable manner to drug addicts who pursue an elusive "high", irrespective of the threat of pursuing that "high" poses to their own basic survival, and the security of others. Global Warming and the pre-emptive war against Iraq are part of the same self-destructive prism of a political-military-industrial complex, which is on a path of mass planetary destruction, backed by techniques of mass-deception.¶ ¶ ¶ ¶ "The scientific debate about human induced global warming is over but policy makers - let alone the happily shopping general public - still seem to not understand the scope of the impending tragedy. Global warming isn't just warmer temperatures, heat waves, melting ice and threatened polar bears. Scientific understanding increasingly points to runaway global warming leading to human extinction", reported Bill Henderson in CrossCurrents. If strict global environmental security measures are not immediately put in place to keep further emissions of greenhouse gases out of the atmosphere we are looking at the death of billions, the end of civilization as we know it and in all probability the end of humankind's several million year old existence, along with the extinction of most flora and fauna beloved to man in the world we share.¶ The Stephen Harper minority government backed by Alberta "Big Oil", the U.S. Republican President Bush administration, and a confederacy of other elites associated with a neo-conservative oriented political-military-industrial complex, has only sought to "buy time" against his critics, (and mount a disingenuous public relations campaign under a new Minister of the Environment). It is apparent that The Stephen Harper government has no commitment to providing any leadership on Canadian or global achievement of the minimum standards set on greenhouse gas emissions reductions under the Kyoto Protocol.¶ The immediate threat of runaway global warming and climate change melt-down¶ There are 'carbon bombs': carbon in soils, carbon in warming temperate and boreal forests and in a drought struck Amazon, methane in Arctic peat bogs and in methane hydrates melting in warming ocean waters. "For several decades it has been hypothesized that rising temperatures from increased greenhouse gases in the atmosphere due to burning fossil fuels could be releasing some of and eventually all of these stored carbon stocks to add substantially more potent greenhouse gases to the atmosphere," Bill Henderson further elaborates.¶ Given time lags of 30-50 years, we might have already put enough extra greenhouse gases into the atmosphere to have crossed a threshold to these bombs exploding, their released greenhouse gases leading to ever accelerating global warming with future global temperatures maybe tens of degrees higher than our norms of human habitation and therefore extinction or very near extinction of humanity.¶ "(T)he science is clear. We need not a 20% cut by 2020; not a 60% cut by 2050, but a 90% cut by 2030 (1). Only then do we stand a good chance of keeping carbon concentrations in the atmosphere below 430 parts per million, which means that only then do we stand a good chance of preventing some of the threatened positive feedbacks. If we let it get beyond that point there is nothing we can do. The biosphere takes over as the primary source of carbon. It is out of our hands," George Monbiot says.¶ Ticking Time Bomb by John Atcheson , a geologist writing in the Baltimore Sun, is the best and almost only mainstream media explanation of runaway global warming and how close we are to extinction.¶ "There are enormous quantities of naturally occurring greenhouse gasses trapped in ice-like structures in the cold northern muds and at the bottom of the seas. These ices, called clathrates, contain 3,000 times as much methane as is in the atmosphere. Methane is more than 20 times as strong a greenhouse gas as carbon dioxide."¶ ¶ ¶ ¶ Antarctic further Global Warming alarms¶ Stephen Connor reported in the February 16, edition of The Independent that, "The long-term stability of the massive ice sheets of Antarctica, which have the potential to raise sea levels by hundreds of metres, has been called into question with the discovery of fast-moving rivers of water sliding beneath their base."¶ "Scientists analysing satellite data were astonished to discover the size of the vast lakes and river systems flowing beneath the Antarctic ice sheets, which may lubricate the movement of these glaciers as they flow into the surrounding sea", Mr. Connor further reports.¶ The discovery raises fresh questions about the speed at which sea levels might rise in a warmer world due to the rate at which parts of the ice sheets slide from the land into the ocean, scientists said at the American Association for the Advancement of Science in San Francisco.¶ "We've found that there are substantial subglacial lakes under ice that's moving a couple of metres per day. It's really ripping along. It's the fast-moving ice that determines how the ice sheet responds to climate change on a short timescale," said Robert Bindschadler, a NASA scientist at the Goddard Space Flight Centre in Maryland, one of the study's co-authors.¶ "We aren't yet able to predict what these ice streams are going to do. We're still learning about the controlling processes. Water is critical, because it's essentially the grease on the wheel. But we don't know the details yet," Dr. Bindschadler said. "Until now, we've had just a few glimpses into what's going on down there. This is the most complete picture to date about what's going on," he said.¶ The findings, to be published in the journal Science, came from satellite surveillance of the surface elevation of the ice sheets, which found that they rise or lower depending on the amount of water flowing between the base of the ice sheet and the rock beneath.¶ The scientists identified many regions of the ice sheet either rose or deflated between 2003 and 2006 as a result of water movements below. Water would be capable of this because it is highly pressurised under the weight of the overlying ice, they said.¶ Glaciologists have known for some time that water exists under the Antarctic ice sheets - which can be hundreds of metres thick - but they were surprised to find how much water is involved and the speed at which it moves from one subglacial reservoir to another, said Helen Fricker at the Scripps Institution of Oceanography in San Diego.¶ "We didn't realise that the water under these ice streams was moving in such large quantities, and on such short time scales. We thought these changes took place over years and decades, but we are seeing large changes over months. The detected motions are astonishing in magnitude, dynamic nature and spatial extent," Dr Fricker said.¶ The West Antarctic ice sheet is the second biggest on the continent, and the rate at which ice flows from it to the Ross ice shelf, and then ultimately into the sea, is critical in assessing the likely impact of climate change on global sea levels.¶ The study provides evidence that subglacial water is stored in a linked system of reservoirs underneath the ice and can move quickly into and out of those reservoirs. This activity may play a major role in controlling the rate at which ice moves off the continent, Dr Fricker said.¶ "The links between ice stream activity and the climate are not well understood. To predict how the ice sheets might respond to global warming, this new information is vital as it gives us a more complete picture of what is happening under the ice," she said.¶ The study was conducted using the Icesat satellite. It carries a laser altimeter instrument to detect changes as small as 1.5 centimetres in the elevation of the ice sheet's surface, from an orbit of 400 miles above the earth. "From 600 kilometres up in space, we were able to see small portions of the ice sheet rise and sink," Dr Bindschadler said.¶

### 1AC - Hegemony Advantage

#### First, drones will inevitably be inhabiting our national airspace by 2015 - they will be flying side by side civilian aircraft

**Boyle 12** (Rebecca, staff writer for Popular Science, “Drones Will Be Admitted to Standard US Airspace By 2015”, 02/07/12, AD: 07/11/12, <http://www.popsci.com/technology/article/2012-02/under-newly-authorized-airspace-rules-drones-will-fly-alongside-piloted-planes-2015> | Kushal)

The skies are going to look very different pretty soon, and it’s been a long time coming. Congress finally passed a spending bill for the Federal Aviation Administration, allocating $63.4 billion for modernizing the country’s air traffic control systems and expanding airspace for unmanned planes within three and a half years.¶ By Sept. 30, 2015, drones will have to have access to U.S. airspace that is currently reserved for piloted aircraft. This applies to military, commercial and privately owned drones — so it could mean a major increase in unmanned aircraft winging through our airspace. That’s airspace to be shared with airliners, cargo planes and small private aircraft.¶ Technology, Rebecca Boyle, air traffic system, airplanes, airspace, aviation, FAA, federal aviation administration, nextgen aeronauticsAs it is now, drones can only use some pieces of military airspace and they can patrol the nation’s borders. Some 300 public agencies can also use drones, according to the AP, but they must be at low altitudes and away from airports.¶ The FAA has spent years planning its NextGen upgrade, a new system designed to streamline traffic at airports, save fuel and reduce air travel headaches. NextGen is a behemoth program that consists of several complementary systems, notably the Automatic Dependent Surveillance-Broadcast, or ADS-B in airspace lingo. This system uses GPS to determine aircraft location, and it will enable planes to land in a more efficient, steep glide, rather than the fuel-wasting stair-step descents of the past and present. This is already being rolled out in some places, but the new bill requires the FAA to set up new arrival procedures at the country’s 35 busiest airports.¶ Eventually, planes will all have GPS that can update a plane’s location every second, instead of the six to 12 seconds it takes with current radar systems, AP points out. This will allow pilots to know where their planes are relative to each other, and this could help ease congestion and make for smoother taxi procedures.¶ NextGen has been planned and debated for years, and the modernization plan has been stymied by Congressional wrangling since 2007. This new bill, which now goes to President Obama for his signature, will finally get things moving again.

#### And, integrating our airspace with staffed and unstaffed systems is key to our power projection and securing the skies - Next Gen is key to those aligning capabilities

**Palmer 11** (Al, University of North Dakota, “The Importance of Furthering UAV-ATC Discussions”, UAS: The Global Perspective - 9th Edition - June 2011, AD: 07/11/12, <http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=6&ved=0CF8QFjAF&url=http%3A%2F%2Fwww.uvs-info.com%2Findex.php%3Foption%3Dcom_docman%26task%3Ddoc_download%26gid%3D7270%26Itemid%3D20&ei=g4_9T_2vF6be2AWkmYnPBg&usg=AFQjCNH2wt0-JdhQoo614V9Evyd4IXvhXg> | Kushal)

North Dakota is heavily involved in UAS-related activities including airspace integration, pilot training, research and development and, last but not least, maintenance.¶ North Dakota is poised to play a signifi cant role in the Unmanned¶ Aircraft (UA) industry for the following reasons: unencumbered¶ airspace, low population density, State and Federal governmental¶ support, universities with strong aviation and research programs¶ and military bases with Unmanned Aircraft Systems (UAS)¶ missions. Access to the National Airspace System (NAS) is the key to commercialization of UAS civil operations. Consequently, the integration of UAS into the NAS has been referred to as the “Holy Grail” of UAS civil operations. There is a national imperative to move forward with formulating the criteria and rules by which manned and unmanned aircraft will operate safely together in the nation’s airspace. Currently, the only¶ access to the NAS is either Restricted Special Use airspace, which¶ is very limited, or Certifi cates of Authorization or Waiver (COA).¶ Of course, COA’s are an authorization issued by the Air Traffi c¶ Organization to a public operator for a specific UA activity.¶ After a complete application is submitted, the Federal Aviation¶ Administration (FAA) conducts a comprehensive operational and¶ technical review. If necessary, provisions or limitations may be¶ imposed as part of the approval to ensure the UA can operate¶ safely with other airspace users. In most cases, the FAA provides¶ a formal response within 60 days from the time a completed¶ application is submitted. Consequently, North Dakota proposes¶ to implement a Test Center to refi ne and validate UAS operations¶ in an evolving NAS. This Test Center is referred to as Limited¶ Deployment - Cooperative Airspace Project (LD-CAP).¶ The purpose of LD-CAP is to establish airspace in central North¶ Dakota wherein the use of Automatic Dependent Surveillance-¶ Broadcast (ADS-B) in UA in a Next Generation Air Transportation System (NextGen) - like airspace can be tested. With such a¶ test bed obstacles that are preventing the integration of UA into¶ civil airspace can be overcome. LD-CAP is a community effort¶ that requires input from numerous stakeholders. The primary¶ partners in the LD-CAP effort are University of North Dakota¶ (UND), North Dakota state University (NDSU), Mitre, NASA,¶ the North Dakota National Guard (NDNG) and the North Dakota¶ Aeronautics Commission (NDAC).¶ The North Dakota State legislature appropriated substantial¶ funds to support development, education and operational¶ initiatives through the University of North Dakota (UND) UAS¶ Center of Excellence with an objective of realizing substantial¶ returns in job creation, industrial immigration and economic¶ growth. Specifi cally, the State legislature signifi cant appropriated¶ funds for the following projects:¶ • Purchase a Predator Mission Aircrew Training System¶ (PMATS)¶ • Establish a PMATS Training Center at Grand Forks AFB¶ • Develop a UAS software and curriculum for the PMATS¶ • UAS airspace access initiative - a strategic roadmap¶ • Develop a intelligence-related training center¶ • UAS maintenance and support services operation¶ • sUAS introduction course for Law Enforcement and Public¶ Safety Agencies¶ • LD-CAP¶ North Dakota federal, state and local governments have made¶ a priority of engaging UAS-related industries to establish the¶ State as a preferred location in support of UAS operations,¶ maintenance, modifi cation, overhaul, data acquisition and¶ processing, sensor and payload research and development¶ and other UAS applications. The John D. Odegard School of¶ Aerospace Sciences (JDOSAS) is playing a leadership role in¶ UAS-related activities in North Dakota.

#### And, NextGen provides interoperability between military and U.S. airspace

**Babbitt 09** (J. Randolph Babbitt, administrator of the FAA, “Air Traffic Control Association Convention - "Cooperation, Collaboration and Interoperability", 10/05/09, AD: 07/12/12, <http://www.atc-network.com/News/31385/Air-Traffic-Control-Association-Convention-Cooperation-Collaboration-and-Interoperability-> | Kushal)

As always, kudos to ATCA on a good show. But before we get rolling, Id like to issue a special welcome to our international visitors, the civil aviation authority representatives, the vendors, the air navigation service providers, CANSO. It is important to the success of global aviation that youre with us at this conference. As you can see from the agenda and as you walk through the exhibits, were here to talk about a number of things, but the big ticket in this hall is NextGen. Lets be candid with ourselves for a moment: if our equation for NextGen doesnt have an international component, were dead in the water. Look at any forecast by any group, and its going to tell you that the international market is on the way up. Its got to be factored in, no questions asked. NextGen is not limited to red, white and blue. If were sure of anything about aviation, its that times are changing. Long-range flights are routine. Detroit to Narita is just one more run. When youre talking about puddle jumpers these days, that puddle is an ocean. Recognizing this, we do indeed need cooperation and collaboration between and among ourselves here in the States. But cooperation and collaboration cant stop at the shoreline. We must make sure that interoperability is the order of the day, and I think we are. If your product or service doesnt work beyond your borders, its time to get back to the drawing board. The Obama Administration and Secretary LaHood are enthusiastic about the potential for international linkage, such as the links between NextGen/SESAR. Ive flown enough to know that this is a success story waiting to happen. As I told RTCA, we need to advance well beyond the preliminaries of NextGen. We as a group need to commit together to giving modernization the momentum it needs. Without equivocation, Im making that commitment for the FAA right here, right now. I didnt want there to be any doubt with my comments to RTCA, and I want to drive home that same message this morning. We have the support of the Secretary and the President. They want this modernization program up and running as quickly as possible, and they are fully supportive. We have the green light. And it should be equally clear to the people in this room that international linkage is only the half of it. Under the philosophy of NextGen, everyone is interlinked. NextGen is not an air traffic control modernization program in its silo, and it was never intended to be. The goal is to have everyone become part of the infrastructure. Aircraft, air traffic control, airline operations centers, airports, defense and homeland security systems and the people who operate, inspect and maintain all of these. Further, NextGen isnt created in the airlines own image. NextGen is also designed for general aviation, military aircraft, helicopters, unmanned aerial systems, commercial spaceflight the entire aviation community. With that as an over-arching principle, everyones got to be on the same page strategically, tactically, operationally. We want everyone talking together. That is the end-state, if you will, of NextGen. But in order for that to happen, everyones got to start talking together now. Cooperation is needed at unprecedented levels if were going to pull this one off. If youre going into this with a territorial mind-set, dont do it. There is no one major player in the system as contemplated by NextGen. If you have a burning need to put someone at the top of the list, its the passenger. Hes not concerned with multi-lateration or situational awareness. The passenger is focused on the basics. Did I leave enough time to make it through security? Did I take off when I was supposed to? Did I land when I was supposed to? And did my bags have the happy coincidence of being on the plane with me? The RTCA gave us an excellent head start on the acceleration plans with its recommendations. There wasnt a whole lot of ambiguity in there. We asked the question, What do you want? And industry answered. The Task Force has forged a consensus across a wide spectrum of users. The recommendations are clear, actionable, and achievable. And even if it does require us to modify our plans and processes, we are ready to commit appropriate resources and get to work on implementation of Task Force recommendations. Concerning equipage, we will place NextGen capabilities where they matter. The critics who pointed out that we had some RNP and RNAV approaches in ineffective spots are right. Were going to push for these approaches where they deliver greatest efficiencies. And concerning acceleration itself, were not going to sacrifice long-term deliverables at the altar of near-term expediencies. Industry wants maximum benefit from todays tools. NextGens long-term capabilities arent a mutually exclusive endeavor. For example, the lessons learned from implementing the recommendations of this task force will help us derive maximum benefit from ADS-B once the supporting infrastructure and standards are in place. In closing, each of these programs that make up NextGen is designed with the broadest possible application in mind. We’re stressing cooperation, collaboration and interoperability. We have the White House behind us, and the industry giving us clear direction about what it needs. The rest is up to us all of us.

#### Interoperability enhances domestic military capabilities

**ICAO 11** (International Civil Aviation Organization, “Civil/Military Cooperation in Air Traffic Management”, 2011, AD: 07/13/12, <http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=8&ved=0CGIQFjAH&url=http%3A%2F%2Fwww.paris.icao.int%2Fdocuments_open_meetings%2Fdownload.php%3Fmaincategory%3D200%26subcategory%3D203%26file%3DCirc%2520330_en.pdf&ei=1zIAUJGmOuXg2wWE44yWBA&usg=AFQjCNHw_Ec1jE3aHt0DdL0hta9q-T_ZZg&sig2=JDVknbEwPcEZdq-UJqeORg> | Kushal)

Interoperability at the operational level occurs when strategic, political and technical interoperability come together, not only to help all aviation partners to shape the environment and manage crisis, but also to support any anticipated aviation growth and its associated impact on aviation safety, environment, efficiency and capacity. 2.3.2 The benefits of interoperability at the operational and technical level generally derive from the interchangeability of system elements or operational procedures. An example is the system-wide information management (SWIM) concept which is or will be used in a civil (SESAR/NextGen) as well as in a military (Network Centric Warfare) environment. These concepts enable users to randomly use that portion of information viable for their respective operation and can be achieved only through the interoperable technical feeders of the network. For this reason States and military organizations should endeavour to define mutually interoperable systems early in their design phase. 2.3.3 Another benefit of interoperability is modularity, which allows for the possibility of collecting only those technical facilitators that are necessary to conduct one’s operation. An example of this is the all-purpose structured Eurocontrol surveillance information, known as the ASTERIX protocol, used for radar data exchange. This exchange protocol, in combination with a multi-radar tracker, can enable a civil air navigation service provider (ANSP) to use externally provided radar data, without necessarily procuring its own radar system, by using radar data provided by military sensors. States and military organizations should ensure a level of modularity in their respective systems to allow those systems access to a free exchange of information as required.

#### Securitizing our national airspace is key to our forward-deployed power projection, which is key to hegemony and de-escalation of conflict

**Thayer 6 –** (professor of security studies @ Missouri State Bradley, The National Interest, “In Defense of Primacy”, November/December, p. 32-37, Kushal)

A grand strategy based on American primacy means ensuring the United States stays the world's number one power‑the diplomatic, economic and military leader. Those arguing against primacy claim that the United States should retrench, ei­ther because the United States lacks the power to maintain its primacy and should withdraw from its global commitments, or because the maintenance of primacy will lead the United States into the trap of "imperial overstretch." In the previous issue of The National Interest, Christopher Layne warned of these dangers of pri­macy and called for retrenchment.1 Those arguing for a grand strategy of retrenchment are a diverse lot. They include isolationists, who want no foreign military commitments; selective engagers, who want U.S. military commitments to centers of economic might; and offshore balancers, who want a modified form of selective engagement that would have the United States abandon its landpower presence abroad in favor of relying on airpower and seapower to defend its in­terests. But retrenchment, in any of its guis­es, must be avoided. If the United States adopted such a strategy, it would be a profound strategic mistake that would lead to far greater instability and war in the world, imperil American security and deny the United States and its allies the benefits of primacy. There are two critical issues in any discussion of America's grand strategy: Can America remain the dominant state? Should it strive to do this? America can remain dominant due to its prodigious military, economic and soft power capa­bilities. The totality of that equation of power answers the first issue. The United States has overwhelming military capa­bilities and wealth in comparison to other states or likely potential alliances. Barring some disaster or tremendous folly, that will remain the case for the foreseeable future. With few exceptions, even those who advocate retrenchment acknowledge this. So the debate revolves around the desirability of maintaining American pri­macy. Proponents of retrenchment focus a great deal on the costs of U.S. action­ but they fall to realize what is good about American primacy. The price and risks of primacy are reported in newspapers every day; the benefits that stem from it are not. A GRAND strategy of ensur­ing American primacy takes as its starting point the protec­tion of the U.S. homeland and American global interests. These interests include ensuring that critical resources like oil flow around the world, that the global trade and monetary regimes flourish and that Washington's worldwide network of allies is reassured and protected. Allies are a great asset to the United States, in part because they shoulder some of its burdens. Thus, it is no surprise to see NATO in Afghanistan or the Australians in East Timor. In contrast, a strategy based on re­trenchment will not be able to achieve these fundamental objectives of the United States. Indeed, retrenchment will make the United States less secure than the present grand strategy of primacy. This is because threats will exist no mat­ter what role America chooses to play in international politics. Washington can­not call a "time out", and it cannot hide from threats. Whether they are terror­ists, rogue states or rising powers, his­tory shows that threats must be confront­ed. Simply by declaring that the United States is "going home", thus abandoning its commitments or making unconvinc­ing half‑pledges to defend its interests and allies, does not mean that others will respect American wishes to retreat. To make such a declaration implies weak­ness and emboldens aggression. In the anarchic world of the animal kingdom, **predators prefer to eat the weak rather than confront the strong**. The same is true of the anarchic world of interna­tional politics. If there is no diplomatic solution to the threats that confront the United States, then the conventional and strategic military power of the United States is what protects the country from such threats. And when enemies must be confront­ed, a strategy based on primacy focuses on engaging enemies overseas, away from .American soil. Indeed, a key tenet of the Bush Doctrine is to attack terrorists far from America's shores and not to wait while they use bases in other countries to plan and train for attacks against the United States itself. This requires a phys­ical, on‑the‑ground presence that cannot be achieved by offshore balancing. Indeed, as Barry Posen has noted, U.S. primacy is secured because America, at present, commands the "global com­mon"‑‑the oceans, the world's airspace and outer space‑allowing the United States to project its power far from its borders, while denying those common avenues to its enemies. As a consequence, the costs of power projection for the United States and its allies are reduced, and the robustness of the United States' conventional and strategic deterrent ca­pabilities is increased.' This is not an advantage that should be relinquished lightly. A remarkable fact about international politics today‑-in a world where Ameri­can primacy is clearly and unambiguous­ly on display--is that countries want to align themselves with the United States. Of course, this is not out of any sense of altruism, in most cases, but because doing so allows them to use the power of the United States for their own purposes, ­their own protection, or to gain greater influence. Of 192 countries, 84 are allied with America‑-their security is tied to the United States through treaties and other informal arrangements‑and they include almost all of the major economic and military powers. That is a ratio of almost 17 to one (85 to five), and a big change from the Cold War when the ratio was about 1.8 to one of states aligned with the United States versus the Soviet Union. Never before in its history has this coun­try, or any country, had so many allies. U.S. primacy‑-and the bandwagon­ing effect‑has also given us extensive in­fluence in international politics, allowing the United States to shape the behavior of states and international institutions. Such influence comes in many forms, one of which is America's ability to cre­ate coalitions of like‑minded states to free Kosovo, stabilize Afghanistan, invade Iraq or to stop proliferation through the Pro­liferation Security Initiative (PSI). Doing so allows the United States to operate with allies outside of the where it can be stymied by opponents. American‑led wars in Kosovo, Afghanistan and Iraq stand in contrast to the UN's inability to save the people of Darfur or even to conduct any military campaign to realize the goals of its charter. The quiet effec­tiveness of the PSI in dismantling Libya's WMD programs and unraveling the A. Q. Khan proliferation network are in sharp relief to the typically toothless attempts by the UN to halt proliferation. You can count with one hand coun­tries opposed to the United States. They are the "Gang of Five": China, Cuba, Iran, North Korea and Venezeula. Of course, countries like India, for example, do not agree with all policy choices made by the United States, such as toward Iran, but New Delhi is friendly to Washington. Only the "Gang of Five" may be expected to consistently resist the agenda and ac­tions of the United States. China is clearly the most important of these states because it is a rising great power. But even Beijing is intimidated by the United States and refrains from openly challenging U.S. power. China proclaims that it will, if necessary, re­sort to other mechanisms of challenging the United States, including asymmetric strategies such as targeting communica­tion and intelligence satellites upon which the United States depends. But China may not be confident those strategies would work, and so it is likely to refrain from testing the United States directly for the foreseeable future because China's power benefits, as we shall see, from the international order U.S. primacy creates. The other states are far weaker than China. For three of the "Gang of Five" cases‑‑Venezuela, Iran, Cuba‑it is an anti‑U.S. regime that is the source of the problem; the country itself is not intrin­sically anti‑American. Indeed, a change of regime in Caracas, Tehran or Havana could very well reorient relations. THROUGHOUT HISTORY, peace and stability have been great benefits of an era where there was a dominant power‑‑Rome, Britain or the United States today. Schol­ars and statesmen have long recognized the irenic effect of power on the anarchic world of international politics. Everything we think of when we con­sider the current international order‑free trade, a robust monetary regime, increas­ing respect for human rights, growing de­mocratization‑‑is directly linked to U.S. power. Retrenchment proponents seem to think that the current system can be maintained without the current amount of U.S. power behind it. In that they are dead wrong and need to be reminded of one of history's most significant lessons: Appalling things happen when international orders collapse. The Dark Ages fol­lowed Rome's collapse. Hitler succeeded the order established at Versailles. With­out U.S. power, the liberal order cre­ated by the United States will end just as assuredly. As country and western great Rai Donner sang: "You don't know what you've got (until you lose it)." Consequently, it is important to note what those good things are. In addition to ensuring the security of the United States and its allies, American primacy within the international system causes many positive outcomes for Washing­ton and the world. The first has been a more peaceful world. During the Cold War, U.S. leadership reduced friction among many states that were historical antagonists, most notably France and West Germany. Today, American primacy helps keep a number of complicated rela­tionships aligned‑-between Greece and Turkey, Israel and Egypt, South Korea and Japan, India and Pakistan, Indonesia and Australia. This is not to say it fulfills Woodrow Wilson's vision of ending all war. Wars still occur where Washington's interests are not seriously threatened, such as in Darfur, but a Pax Americana does reduce war's likelihood, particularly war's worst form: **great power wars**. Second, American power gives the United States the ability to spread de­mocracy and other elements of its ideol­ogy of liberalism. Doing so is a source of much good for the countries concerned as well as the United States because, as John Owen noted on these pages in the Spring 2006 issue, liberal democracies are more likely to align with the United States and be sympathetic to the American worldview.3 So, spreading democracy helps maintain U.S. primacy. In addition, once states are governed democratically, the likelihood of any type of conflict is significantly reduced. This is not because democracies do not have clashing inter­ests. Indeed they do. Rather, it is because they are more open, more transparent and more likely to want to resolve things amicably in concurrence with U.S. lead­ership. And so, in general, democratic states are good for their citizens as well as for advancing the interests of the United States. Critics have faulted the Bush Admin­istration for attempting to spread democ­racy in the Middle East, labeling such an effort a modern form of tilting at windmills. It is the obligation of Bush's crit­ics to explain why democracy is good enough for Western states but not for the rest, and, one gathers from the argument, should not even be attempted. Of course, whether democracy in the Middle East will have a peaceful or sta­bilizing influence on America's interests in the short run is open to question. Per­haps democratic Arab states would be more opposed to Israel, but nonetheless, their people would be better off. The United States has brought democracy to Afghanistan, where 8.5 million Af­ghans, 40 percent of them women, voted in a critical October 2004 election, even though remnant Taliban forces threat­ened them. The first free elections were held in Iraq in January 2005. It was the military power of the United States that put Iraq on the path to democracy. Wash­ington fostered democratic governments in Europe, Latin America, Asia and the Caucasus. Now even the Middle East is increasingly democratic. They may not yet look like Western‑style democracies, but democratic progress has been made in Algeria, Morocco, Lebanon, Iraq, Ku­wait, the Palestinian Authority and Egypt. By all accounts, the march of democracy has been impressive. Third, along with the growth in the number of democratic states around the world has been the growth of the glob­al economy. With its allies, the United States has labored to create an economically liberal worldwide network character­ized by free trade and commerce, respect for international property rights, and mo­bility of capital and labor markets. The economic stability and prosperity that stems from this economic order is a glob­al public good from which all states ben­efit, particularly the poorest states in the Third World. The United States created this network not out of altruism but for the benefit and the economic well‑being of America. This economic order forces American industries to be competitive, maximizes efficiencies and growth, and benefits defense as well because the size of the economy makes the defense burden manageable. Economic spin‑offs foster the development of military technology, helping to ensure military prowess. Perhaps the greatest testament to the benefits of the economic network comes from Deepak Lal, a former Indian foreign service diplomat and researcher at the World Bank, who started his ca­reer confident in the socialist ideology of post‑independence India. Abandoning the positions of his youth, Lal now recog­nizes that the only way to bring relief to desperately poor countries of the Third World is through the adoption of free market economic policies and globaliza­tion, which are facilitated through Amer­ican primacy.4 As a witness to the failed alternative economic systems, Lal is one of the strongest academic proponents of American primacy due to the economic prosperity it provides.

#### US hegemony prevents multiple scenarios for conflict and nuclear war- prefer it to any other power structure; all of their impacts are more likely in a world without American predominance

Kagan 7 (Robert, Senior Associate at the Carnegie Endowment of International Peace, “End of Dreams, Return of History”, 2007, AD: 07/11/12, <http://www.hoover.org/publications/policyreview/8552512.html#n10> | Kushal)

Even as it maintains its position as the predominant global power, it is also engaged in hegemonic competitions in these regions with China in East and Central Asia, with Iran in the Middle East and Central Asia, and with Russia in Eastern Europe, Central Asia, and the Caucasus. The United States, too, is more of a traditional than a postmodern power, and though Americans are loath to acknowledge it, they generally prefer their global place as “No. 1” and are equally loath to relinquish it. Once having entered a region, whether for practical or idealistic reasons, they are remarkably slow to withdraw from it until they believe they have substantially transformed it in their own image. They profess indifference to the world and claim they just want to be left alone even as they seek daily to shape the behavior of billions of people around the globe. The jostling for status and influence among these ambitious nations and would-be nations is a second defining feature of the new post-Cold War international system. Nationalism in all its forms is back, if it ever went away, and so is international competition for power, influence, honor, and status. American predominance prevents these rivalries from intensifying — its regional as well as its global predominance. Were the United States to diminish its influence in the regions where it is currently the strongest power, the other nations would settle disputes as great and lesser powers have done in the past: sometimes through diplomacy and accommodation but often through confrontation and wars of varying scope, intensity, and destructiveness. One novel aspect of such a multipolar world is that most of these powers would possess nuclear weapons. That could make wars between them less likely, or it could simply make them more catastrophic. It is easy but also dangerous to underestimate the role the United States plays in providing a measure of stability in the world even as it also disrupts stability. For instance, the United States is the dominant naval power everywhere, such that other nations cannot compete with it even in their home waters. They either happily or grudgingly allow the United States Navy to be the guarantor of international waterways and trade routes, of international access to markets and raw materials such as oil. Even when the United States engages in a war, it is able to play its role as guardian of the waterways. In a more genuinely multipolar world, however, it would not. Nations would compete for naval dominance at least in their own regions and possibly beyond. Conflict between nations would involve struggles on the oceans as well as on land. Armed embargos, of the kind used in World War i and other major conflicts, would disrupt trade flows in a way that is now impossible. Such order as exists in the world rests not only on the goodwill of peoples but also on American power. Such order as exists in the world rests not merely on the goodwill of peoples but on a foundation provided by American power. Even the European Union, that great geopolitical miracle, owes its founding to American power, for without it the European nations after World War ii would never have felt secure enough to reintegrate Germany. Most Europeans recoil at the thought, but even today Europe ’s stability depends on the guarantee, however distant and one hopes unnecessary, that the United States could step in to check any dangerous development on the continent. In a genuinely multipolar world, that would not be possible without renewing the danger of world war. People who believe greater equality among nations would be preferable to the present American predominance often succumb to a basic logical fallacy. They believe the order the world enjoys today exists independently of American power. They imagine that in a world where American power was diminished, the aspects of international order that they like would remain in place. But that ’s not the way it works. International order does not rest on ideas and institutions. It is shaped by configurations of power. The international order we know today reflects the distribution of power in the world since World War ii, and especially since the end of the Cold War. A different configuration of power, a multipolar world in which the poles were Russia, China, the United States, India, and Europe, would produce its own kind of order, with different rules and norms reflecting the interests of the powerful states that would have a hand in shaping it. Would that international order be an improvement? Perhaps for Beijing and Moscow it would. But it is doubtful that it would suit the tastes of enlightenment liberals in the United States and Europe. The current order, of course, is not only far from perfect but also offers no guarantee against major conflict among the world ’s great powers. Even under the umbrella of unipolarity, regional conflicts involving the large powers may erupt. War could erupt between China and Taiwan and draw in both the United States and Japan. War could erupt between Russia and Georgia, forcing the United States and its European allies to decide whether to intervene or suffer the consequences of a Russian victory. Conflict between India and Pakistan remains possible, as does conflict between Iran and Israel or other Middle Eastern states. These, too, could draw in other great powers, including the United States. Such conflicts may be unavoidable no matter what policies the United States pursues. But they are more likely to erupt if the United States weakens or withdraws from its positions of regional dominance. This is especially true in East Asia, where most nations agree that a reliable American power has a stabilizing and pacific effect on the region. That is certainly the view of most of China ’s neighbors. But even China, which seeks gradually to supplant the United States as the dominant power in the region, faces the dilemma that an American withdrawal could unleash an ambitious, independent, nationalist Japan. Conflicts are more likely to erupt if the United States withdraws from its positions of regional dominance. In Europe, too, the departure of the United States from the scene — even if it remained the world’s most powerful nation — could be destabilizing. It could tempt Russia to an even more overbearing and potentially forceful approach to unruly nations on its periphery. Although some realist theorists seem to imagine that the disappearance of the Soviet Union put an end to the possibility of confrontation between Russia and the West, and therefore to the need for a permanent American role in Europe, history suggests that conflicts in Europe involving Russia are possible even without Soviet communism. If the United States withdrew from Europe — if it adopted what some call a strategy of “offshore balancing” — this could in time increase the likelihood of conflict involving Russia and its near neighbors, which could in turn draw the United States back in under unfavorable circumstances. It is also optimistic to imagine that a retrenchment of the American position in the Middle East and the assumption of a more passive, “offshore” role would lead to greater stability there. The vital interest the United States has in access to oil and the role it plays in keeping access open to other nations in Europe and Asia make it unlikely that American leaders could or would stand back and hope for the best while the powers in the region battle it out. Nor would a more “even-handed” policy toward Israel, which some see as the magic key to unlocking peace, stability, and comity in the Middle East, obviate the need to come to Israel ’s aid if its security became threatened. That commitment, paired with the American commitment to protect strategic oil supplies for most of the world, practically ensures a heavy American military presence in the region, both on the seas and on the ground. The subtraction of American power from any region would not end conflict but would simply change the equation. In the Middle East, competition for influence among powers both inside and outside the region has raged for at least two centuries. The rise of Islamic fundamentalism doesn ’t change this. It only adds a new and more threatening dimension to the competition, which neither a sudden end to the conflict between Israel and the Palestinians nor an immediate American withdrawal from Iraq would change. The alternative to American predominance in the region is not balance and peace. It is further competition. The region and the states within it remain relatively weak. A diminution of American influence would not be followed by a diminution of other external influences. One could expect deeper involvement by both China and Russia, if only to secure their interests. 18 And one could also expect the more powerful states of the region, particularly Iran, to expand and fill the vacuum. It is doubtful that any American administration would voluntarily take actions that could shift the balance of power in the Middle East further toward Russia, China, or Iran. The world hasn ’t changed that much. An American withdrawal from Iraq will not return things to “normal” or to a new kind of stability in the region. It will produce a new instability, one likely to draw the United States back in again. The alternative to American regional predominance in the Middle East and elsewhere is not a new regional stability. In an era of burgeoning nationalism, the future is likely to be one of intensified competition among nations and nationalist movements. Difficult as it may be to extend American predominance into the future, no one should imagine that a reduction of American power or a retraction of American influence and global

### 1AC

Contention II. Solvency

#### NextGen solves using GPS and flight procedures - results in billions of dollars in profit and flight delay reduction

GBTA 12**,** (Global Business Travel Association, “NextGen – Air Traffic Control Modernization”, 2012, AD: 07/09/12, <https://www.gbta.org/usa/governmentrelations/Pages/NextGenAirTrafficControlModernization.aspx> | Kushal)

The Issue: The nation’s air traffic control (ATC) system, based on 1940’s era radar, is inefficient and inadequate to meet growing demand. In the next few years, more passengers and aircraft will tax further an already overloaded system. With approximately 720 million passengers in 2011, FAA projects a billion passengers-per-year will be flying by 2021, increasing chokepoints and flight delays in already heavily congested airspace. Without continuing modernization, the increasingly inefficient ATC system will suffer gridlock in severe weather and business travelers will pay a steep price. NextGen is comprehensive ATC modernization using a Global Positioning System (GPS) built on reliable satellite-based navigation. GPS and other sophisticated technologies/flight procedures will reduce flight delays, flight times and aircraft fuel burn/emissions. NextGen will help business travelers get to their destinations on time and avoid lost opportunities. FAA projects that by 2018, NextGen will reduce flight delays by 35% and provide $23 billion in delay reduction benefits. In a 2011 business case study, Deloitte estimates $29 billion in net benefits in the U.S. each year of full system deployment, beginning in 2026. GBTA Position: GBTA supports initiatives to accelerate ATC modernization as a modern, safe air infrastructure is essential to the business travel industry. Accelerating NextGen means business travelers will see fewer flight delays in the next few years, rather than ten years from now. Congress must approve the Administration’s proposed 11 percent increase in NextGen funding in the Fiscal Year 2013 Budget Request and the FAA must remain focused on achieving measureable benefits. In addition, strong agency leadership is essential to strengthen the management, oversight and implementation programs.

### Inherency - Next Gen Funding Stalled

#### Lack of funding delaying implementation of NextGen

NPR 2011 [Brian Naylor, "'NextGen' Air Traffic System Has Yet to Take Off", October 15, <http://www.npr.org/2011/10/15/141378127/nextgen-air-traffic-system-has-yet-to-take-off>] ttate

The government is trying to modernize the nation's air traffic control system, but cost overruns, software problems and management concerns are making some wonder whether the so-called "Next Generation" system may take another generation to complete.

The radar screens in the nation's aircraft control towers are based on technology dating to World War II. Many of the routes airliners fly were laid out at a time pilots followed bonfires for navigation at night.

The promise of NextGen, as explained in a video on the Federal Aviation Administration's website, is to bring all that into the 21st century.

"You will appreciate the increased safety, environmental benefits and reduced delays as the Next Generation Air Transportation System is adopted," the video says.

What sounds so whizzbang in the video isn't really all that different from the satellite-based GPS navigation systems many Americans have in their cars, but adopting that technology to the airline industry has been a challenge.

The Transportation Department's inspector general reported that one of the key software components of the system is running more than $300 million over budget and might not be fully phased in for another five years.

Airlines, too, have been investing in elements of the new system. One, in particular, would enable aircraft to land in a more efficient, fuel-saving manner — better than the way planes land now.

"You can actually feel it, where a plane will lose altitude and it will drop, say 5,000 feet, and then it will stay steady for a while at the same altitude and then it will drop again," says Steve Lott with the Air Transport Association, the airline industry lobbying group. "It's this stepped landing approach that is not particularly efficient, and using satellite technology, we can have a smoother landing."

Lott says the airline industry wants the FAA to allow more use of the advanced navigation procedure, for which many aircraft are now equipped. The deputy administrator of the FAA, Michael Huerta, told a congressional panel recently the agency is working on making that happen.

"In the year ahead, what we really want to do is focus on how can we improve the quality of these procedures, and how can we see the very real benefits associated with reduced fuel consumption, reduced time and corresponding environmental benefits as well," he says.

But Transportation Secretary Ray LaHood says until Congress approves a long-term bill for the FAA, the NextGen program will remain in a holding pattern.

"We're stuck in mid-air because of the fact that Congress won't pass an FAA bill. As soon as they pass a bill, we've got a big, bold vision for Next Generation technology," he says.

The government's share of the NextGen program is estimated to be more than $20 billion. That's another big concern of its supporters — coming up with that cash at the same time the government is desperately looking for ways to cut spending.

#### Next Gen won't be fully funded in the status quo - lack of federal commitment means project won't be completed

Holeywill and Lippman 12 [Ryan - staff writer @ *Governing* and Daniel - *Governing* contributor, "The 5 biggest US Infrastructure projects, plus 5 at risk", *Governing*, http://www.governing.com/topics/transportation-infrastructure/gov-5-biggest-us-infrastructure-projects-plus-5-at-risk.html] ttate

The project, which aviation administrators began planning in 2003, is dubbed NextGen, and proponents say it would revolutionize air travel in this country by switching from radar-based to satellite-based flight-tracking technology. That, along with other technological advances like improved weather forecasting and communication systems, would allow planes to fly more direct routes instead of following the existing, inefficient flight paths that are arranged like highways in the sky. The result: More flights in the air at any given time, fewer delays and less wasted fuel. But the cost is enormous. FAA officials say they’ll need between $20 billion and $27 billion for the project through 2025. The Government Accountability Office says the cost could actually be as high as $160 billion. Meanwhile, there’s an ongoing debate about what proportion of the cost should be picked up by the airline industry, which has historically been skeptical of the benefits of government-mandated technologies. A recent report from the Department of Transportation’s inspector general said the system will likely face delays because the “FAA has not made critical, longer-term design decisions on NextGen ground and aircraft systems.” To complicate matters, the FAA has spent more than four years without a long-term funding bill, thanks to congressional inaction. That’s made it difficult to pursue larger projects like this one. A long-term bill signed earlier this year should help on that front, but the funding for the effort is still in question. The president’s 2013 budget calls for just over $1 billion for NextGen, which is a drop in the bucket. In a Congress focused on spending cuts, launching something like NextGen could be tough. “I’m guessing we’ll muddle along,” says David Plavin, an aviation consultant. “They won’t provide the big, incremental investment … that’s ultimately necessary.”

#### Cuts to NextGen budget now – stable funding key to reliability and efficiency

GAO 11 [The U.S. Government Accountability Office (GAO) is an independent, nonpartisan agency that works for Congress and investigates how the federal government spends taxpayer dollars. This paper was written by Gerald L. Dillingham, Ph.D., who is the Director of Physical Infrastructure Issues “NEXT GENERATION AIR TRANSPORTATION SYSTEM FAA Has Made Some Progress in Implementation, but Delays Threaten to Impact Costs and Benefits”http://www.gao.gov/assets/590/585588.pdf, 10-5-11]Lin

Delays in program implementation, as described above, and budget constraints have also affected FAA’s capital budget planning. The Page 5 GAO-12-141T Administration has proposed reducing FAA’s capital budget by a total of $2.8 billion, or 20 percent, for fiscal years 2012 through 2015 largely due to governmentwide budget constraints. Most of this proposed reduction is on NextGen and NextGen-related spending, as reflected in FAA’s revised 5-year Capital Investment Plan for fiscal years 2012 through 2016. Congress has not completed FAA’s appropriation for fiscal year 2012, but current House and Senate appropriation bills propose to fund the agency near or above 2011 levels. FAA will have to balance its priorities to ensure that NextGen implementation stays on course while also sustaining the current infrastructure—which is needed to prevent failures and maintain the reliability and efficiency of current operations.

#### Congress bickering is blocking the roll-out of NextGen

Karp 12 [Aaron - senior editor at Air Transport World,”US chamber says NexGen ATC should be ‘top priority’”, http://atwonline.com/operations-maintenance/news/us-chamber-says-nextgen-atc-should-be-top-priority-0112, 1/13/12] Jeong

US Chamber of Commerce president and CEO Thomas Donohue called on Congress to make transitioning to a satellite-based, NextGen air traffic control (ATC) system "a top priority." Delivering his annual "State of American Business" address in Washington Thursday, the influential business lobbyist said upgrading ATC should be part of a "broader effort to modernize the nation's entire physical platform." Financing for the NextGen system is tied up in long-stalled talks in Congress over FAA reauthorization; FAA's latest temporary funding extension expires Jan. 31 (ATW Daily News, Sept. 19, 2011). Donohue said that a "new NextGen air traffic control system ... will ease delays, conserve fuel, create jobs and save lives." Government creating certainty on ATC and other infrastructure funding would be helpful to a US business community dealing with a slow recovery from the 2008-09 financial downturn, he said. "Unfortunately, we think the economy will actually slow down in the early months of the year," he warned. "We expect [US GDP] growth to average about 2.5% in the first half and then work its way back to about 3% by the end of the year." He noted areas of apprehension for US business: "We are deeply concerned that our largest export market and commercial partner, the European Union, faces an unresolved financial crisis and a looming recession. There will be leadership transitions and elections in Taiwan, China, North Korea, Russia, France, Venezuela and Mexico—just to name a few. And in case you haven't noticed, there's an election coming up in the United States as well."

### Inherency Exts - FAA funding being cut

#### **Congress cutting FAA investment at a time where FAA is predicting a doubling of passengers and cargo**

PRINCIPATO 12 [ Greg - President, Airports Council International-North America and International Trade and Transportation specialist, “Why we should invest today in 'Airports Inc.'”, March, <http://thehill.com/blogs/congress-blog/labor/218525-faa-why-we-should-invest-today-in-airports-inc>] ttate

With the latest Federal Aviation Administration (FAA) forecast predicting a doubling of passengers and cargo by 2030, the current funding system is not up to the job of ensuring airports will have the infrastructure they need to handle such dramatic increases in traffic.

This will have far-reaching consequences. Commercial airports are powerful economic engines, generating 10.5 million jobs and $1.2 trillion for the U.S. economy, according to a new Airports Council International-North America study. Across the country, workers and businesses count on local airports to attract investment and move people and goods around the world. Since 2001, the total number of jobs associated with airports has increased by more than 50 percent.

Despite unprecedented growth and clear evidence of the economic benefits of infrastructure investments, airports expect to have $80 billion in unmet needs through 2015 because of the flawed system used to pay for infrastructure projects.

That has not always been the case. Airports generated millions of jobs and trillions of dollars for local communities between 2001 and 2010 because President Bill Clinton and Congress made two decisions to improve airport infrastructure planning and investment in 2000.

The first decision allowed local communities to raise more money to finance airport improvements by giving them the authority to increase the passenger facility charge from $3 to $4.50. This helped meet local needs by expanding airport capacity to serve more passengers, handle more cargo, attract more air service and most important: promote business and commerce.

The second decision increased investments in the federal Airport Improvement Program (AIP) so that the money users pay into the nation’s Airport and Airway Trust Fund could be reinvested into the system, including the airports where all of this economic activity begins and ends. The money for this comes from the aviation trust fund which is funded by users.

Growth in jobs and business activity took place because we made a national decision to invest in the future – the airports that serve as the economic hubs of our national aviation system.

The result is that in 2010, airports were responsible for about 8 percent of U.S. gross domestic product and 7 percent of all U.S. jobs. By any standard, that is a significant return on investment. Dollar for dollar, commercial airports rate as a remarkably worthwhile infrastructure investment.

This is not news to other countries. Our international competitors recognize the benefits of modern airport infrastructure. That’s why they are building and expanding airports at a rapid pace (China alone is now building 12 to 15 new airports per year) to prepare for predicted growth in global travel and business.

Unfortunately, we are retreating from these policy and investment decisions at just the wrong time. After five years, 23 extensions and a 14-day shutdown, Congress passed an FAA Reauthorization bill early this year that did not provide for any new funding for airports – the passenger facility charge ceiling was not raised and Airport Improvement Program funding was cut.

Yet as the FAA data show, commercial airports need to begin investing now in order to meet the long-term needs of the traveling public over the next two decades. Commercial airports must have new runways and terminals, and aging facilities must be upgraded. This requires long lead times – as much as eight years – to move through the planning and permitting process. And don’t forget that successful implementation of the future air traffic control system known as NextGen depends on airport infrastructure investment as well.

### Economy Adv Exts - Brinks - US economy

#### And, US sluggish job growth needs revitalization - key to American recovery and global economic stability - the economy is heading towards the cliff's edge

Heather,Stewart 12,the Observer's economics editor,”US jobs slowdown is bad news for the world economy”, http://www.guardian.co.uk/business/2012/jul/06/us-jobs-slowdown-bad-news-for-world?newsfeed=true,7/6/12 jeong

America's recovery from the deepest economic crisis in living memory is grinding to a halt. That is the message from today's payrolls report, and it's bad news for the world's biggest economy, and bad news for the world.¶ Yesterday's rash of rate cuts, from central banks in Britain, the eurozone and China, underlined the fact that policymakers everywhere fear the global economy is sliding into a synchronised downturn.¶ Barack Obama's more aggressive approach to keeping the public spending taps turned on, combined with the Federal Reserve's everything-but-the-kitchen sink monetary policy, has helped the US to escape the worst of the chill afflicting Europe and many developing countries over the past twelve months, and the Fed could yet take yet more action – perhaps launching a third round of quantitative easing.¶ But with just 80,000 new jobs created in June – fewer than the 90,000 expected by experts, and far too few to bring down the unemployment rate, which is stuck at 8.2%, it's become increasingly clear that the economy is slowing, even before it plunges over the "fiscal cliff" in 2013, when spending cuts and tax rises will put the squeeze on US growth.¶ Few observers think the coming global slump is likely to be as deep or long-lasting as the recession that followed the collapse of Lehman Brothers in September 2008, as confidence collapsed just about everywhere.¶ But that grim episode showed policymakers that in the age of globalisation, there is no such thing as "decoupling": today's economies and financial systems are so closely intertwined that if the crisis is deep enough, everyone gets dragged in. With the US also, it seems, succumbing to the collective cold, there is little hope of anything but a grim year for the world economy in 2012.¶ China is expected to reveal next week that its growth rate has slipped; much of Europe (including the UK) is already in recession; and with Spanish and Italian bond yields back at danger-levels, the deal painstakingly assembled at last week's latest "make-or-break" euro summit appears to be falling apart. So it's hardly surprising US firms are not in the mood to hire thousands of new staff.¶ Like politicians everywhere in the past twelve months, Obama will no doubt do his best to argue – with some justification – that America's slowdown was made overseas. But for the 8.2% of the US workforce who remain stuck on the scrap heap, that will be scant comfort — and this latest news certainly won't help smooth his path back to the White House.¶

### Economy Adv Exts - Brinks - Global Economy

#### Global economy is marching towards a collapse - we are facing an unprecedented crisis

Snyder 12 (Michael Snyder, the editor of the economiccollapseblog.com; “19 sources warning about a coming global financial collapse”, <http://etfdailynews.com/2012/07/10/19-major-sources-warning-about-a-coming-global-financial-collapse-tza-sds-faz-spy-indexsp-inx/>, July 10th 2012) mcclellan

Global leaders have tried just about everything that they can think of, but the coming global financial catastrophe continues to march steadily toward us.  We have seen “stimulus packages”, quantitative easing, bond buying, interest rate cuts, emergency economic summits, bailout packages for banks, bailout packages for entire nations, “Operation Twist”, unprecedented government intervention in business and massive amounts of new government debt and yet nothing seems to revive the global economy.  In fact, it looks like we are rapidly heading into the second dip of a “double dip recession”.  Unfortunately, many believe that this next dip will be more like a full-blown depression.  All over the world, top economic experts are warning that we are facing an unprecedented crisis of debt and insolvency that will result in a global financial catastrophe.  The eurozone is drowning in debt, the U.S. government is drowning in debt and major banks all over the globe are drowning in debt.  Global authorities have been trying to patch the system together and keep it going, but the incredible damage that all of this debt has done is now becoming apparent to everyone.  The global debt bubble that has fueled prosperity in the western world for the last several decades is getting ready to burst, and when that happens the chaos that will result will be absolutely horrifying.

### Economy Adv Exts - Brinks - Airline Industry

#### Airline industry is on the brink - suffering from profit losses

Matthew, Phillips,11, <http://www.freakonomics.com/2011/06/24/why-do-airlines-always-lose-money-hint-its-not-due-to-taxes-or-fuel-costs/>, “Why Do Airlines Always Lose Money? Hint: It’s Not Due to Taxes or Fuel Costs”,6/24/11.

It’s been more than 30 years since the airline industry was deregulated in 1978. Since then it’s lost nearly $60 billion on U.S. operations, though most of the losses have come since 9/11. The airlines were already in trouble before the attacks happened. The plunge in demand and resulting liquidity crisis led to billions in government cash and loan guarantees– the first true bailout of the 21st century, and certainly a sign of things to come in the next decade.¶ In a paper published last month, (Abstract [here](http://www.nber.org/papers/w16744); full version [here](http://faculty.haas.berkeley.edu/borenste/NBERw16744.pdf)) Berkeley economist and overall airline guru [Severin Borenstein](http://faculty.haas.berkeley.edu/borenste/) examines some of the most common explanations for the airline industry’s dismal performance, and why experts and deregulation advocates failed so badly to predict what would happen after deregulation 30 years ago. A few key stats:¶ Domestic passenger airline operations lost $10 billion from 1979 to 1989, made profits of $5 billion in the 1990s and lost $54 billion from 2000 to 2009. To put these numbers in context, at the end of 2009, the entire book value of U.S. passenger carriers’ assets was about $163 billion and the book value of shareholder equity was $10 billion. Even at the end of 2000, after six consecutive profitable years, their assets were $159 billion and shareholder equity was $40 billion.¶ From 1979 to 2001, the U.S. airline passenger fleet grew in every year, by an average of 4.9% per year measured by aircraft and 3.6% per year measured by aircraft-seats. From the end of 2001 to the end of 2008 (latest available date), aircraft and aircraft-seats declined by 1.7% and 1.4% per year respectively.¶ The domestic airline industry has reported negative net income in 23 of 31 years since deregulation and a strongly negative aggregate net present value of earnings.¶ The knee jerk explanation among many airline analysts has been to blame the industry’s poor performance on overly burdensome taxes and high fuel costs. But Borenstein argues they’ve had little to do with it:¶ Descriptive statistics suggest that high taxes have been at most a minor factor and fuel costs shocks played a role only in the last few years. Major drivers seem to be the severe demand downturn after 9/11 — demand remained much weaker in 2009 than it was in 2000 — and the large cost differential between legacy airlines and the low-cost carriers, which has persisted even as their price differentials have greatly declined.¶ Here’s his case against fuel costs as the main culprit:¶ Fuel costs increases have certainly been a significant component of losses in some years, most obviously in 2008. Over the deregulation era, however, oil costs were highest in the first 7 years and the most recent 5 years, over $40 per barrel in 2009 dollars, and much lower during the 19 intervening years. [F]rom 1986 to 2004 the average jet fuel price was below $1.40 per gallon — relatively stable and much lower than in the early period of deregulation. Yet, the industry still lost money in 13 of those 19 years and on net lost $31 billion in 2009 dollars.¶ While there have been several taxes added to the cost of flying (passenger facility charges in the early 1990s, the segment tax in 1997, and the September 11 security fee in early 2002), Borenstein argues that the problem seems not to be that taxes have risen, but that base fares have fallen and stayed so low. He attributes this to the rise of low-cost carriers (LCCs), and the inability of the legacy players to adjust:¶ Adjusted for the average flight distance, legacy carrier costs have remained 30%-60% higher than the LCCs for nearly all of the deregulation era, averaging about 40% higher in the last decade. While the cost differential between LCCs and non-LCCs has remained large, the average price differential has been shrinking. LCC fares have declined much less than those of legacy carriers in the 2000s, reflecting in part their lower burden of excess aircraft capacity. This is no doubt a large part of the reason that LCCs have suffered much milder losses in the 2000s.¶ Airline bottom lines improved in 2010 as the industry consolidated routes and took profits, but Borenstein sees no reason why the future will be any less dismal.¶ [T]here is little reason to think those disruptions will be less frequent in the future. Furthermore, after more than 30 years, it seems unlikely that airline losses are due entirely to a series of unfortunate exogenous events relative to what management and investors should have expected.¶ [T]he experience of the last decade suggests that until legacy carriers can either close the cost gap with LCCs or increase the price premium they maintain, they will likely have difficulty earning consistent profits through the typical cycles in the airline business environment.

#### Airline industry is near collapse - loss of profits and personnel - multiple airlines filing for Chapter 11

Philip Greenspun,11,http://articles.businessinsider.com/2011-07-04/home/29986242\_1\_airline-industry-passenger-traffic-pilots,http://articles.businessinsider.com/2011-07-04/home/29986242\_1\_airline-industry-passenger-traffic-pilots,7/4/11,editor of Business Insider.

The June/July 2011 issue of Air Line Pilot, the official journal of ALPA, the largest U.S. airline pilot’s union, arrived in the mail. It contains a review of the preceding decade. Here are some interesting numbers:¶ the peak of U.S. airline employment was in 2000, with more than 650,000 Americans working for an airline. “U.S. airlines have cut nearly 150,000 employees since the peak,” based on government statistics, leaving just over 500,000 employed¶ the peak of U.S. airline pilot employment was in 2005, with 76,078 pilots. The numbers are down slightly since then, with 74,552 pilots working in 2010. There has been a gradual shift from major airlines to regional.¶ passenger traffic in the U.S. peaked in 2007 and the current traffic levels are about 6 percent below the peak¶ ticket prices during the decade, adjusted for inflation, went down 21 percent (they were flat in nominal terms; compared to a 117 percent rise in college tuition, an 82 percent rise in the cost of eggs, and a 46 percent rise in the cost of a movie ticket)¶ jet fuel prices rose an average of 10 percent per year during the decade¶ revenues for U.S. cargo-only airlines, such as UPS and Fedex, grew from $20 billion in 2001 to more than $30 billion in 2010 (down from a 2008 peak of more than $35 billion); these numbers are not adjusted for inflation and the 2001 number would be about $24.6 billion in 2010 dollars¶ the last supersonic passenger flight, an Air France Concorde from Paris to New York, took place in 2003¶ more than 30 percent of U.S. airlines filed for Chapter 11 bankruptcy protection during the decade (i.e., 30 percent of airline shareholders were wiped out)¶ a lot of new jobs for pilots will be with “state-owned airlines”; under the headline “Rise of the Middle Eastern Airlines”, it is forecast that “By 2029, 68 percent of air traffic volume will be from the emerging economies in such countries and regions as Asia, Brazil, India, and the Middle East.”¶ Read more: http://articles.businessinsider.com/2011-07

### Economy Adv Exts - Demand will increase

#### Air Traffic demand will double over the next decade

Sheridan 06 (Thomas B., American professor of mechanical engineering and Applied Psychology Emeritus at MIT. <http://www.resilience-engineering.org/REPapers/Sheridan_R.pdf>) cass

Air traffic demand is predicted to double by 2020-2025 in the U.S., Europe, China and elsewhere. The larger airports in the U.S. and Europe are currently operating at full capacity. Economic and construction delay and cost factors suggest that mostly the same airports and runways will have to be used, and especially smaller airports used more efficiently to supplement the larger airports. Radar surveillance technology has been shown to err by up to 1/2 mile, depending on aircraft distance from a radar site. (This constraint is largely responsible for regulations that restrict aircraft separation to 5 miles horizontal and 1000 feet vertical in enroute airspace, and 3 miles, 1000 feet in airspace near airports.) Behavioral analysis indicates that human air traffic controllers cannot observe and vector many more aircraft than they now handle in a sector. And it is far from clear that just adding more controllers would be affordable, or would even work in any case. Since personnel constitute the greatest cost factor, the hope would be to keep the number of personnel the same or actually decrease the number. For all these reasons it has been decided that a radical departure from the current, mostly manual, air traffic control system must be put in place. Figure 1 shows the trends that underlie this decision. In the U.S. an inter-agency Joint Planning and Development Office (JPDO) for the Next Generation Air Transportation System (NGATS) was set up in 2004. In addition to its own planning staff are eight Integrated Project Teams (IPTs) responsible respectively for: agile air traffic management; airport infrastructure; proactive safety management; user-specific situation awareness (including a new broadband information network); weather observation, prediction and impacts; security (presumably without limiting mobility or civil liberties); harmonization of equipage and operations globally; and environmental protection (with sustained economic growth). Each IPT has representatives from various government agencies, principally the Federal Aviation Administration (FAA), the agency responsible for aircraft certification, air traffic control as well as training of control personnel, and the National Aeronautics and Space Administration (NASA), the agency that has been primarily responsible for aviation research and development. Because global positioning satellite (GPS) technology will play a key role in the new system the US Department of Defense (that is responsible for those systems) is also a player, as are the Environmental Protection Agency (EPA), the Department of Commerce, and the Department of Homeland Security (DHS), all included for obvious reasons. In addition an organization called the NGATS Institute has been set up to include industry participants and perspectives. The organizational complexity of the project is evident.

### Economy Adv Exts - Delay Costs

#### Delays extremely costly - costs exponentially grow each minute a flight is delayed - increasing demand will only continue to compound the delay problem

The Eno Center 12 [The Eno Center for Transportation is a neutral, non-partisan think-tank that promotes policy innovation and leads professional development in the transportation industry “NextGen: Aligning Costs, Benefits and Political Leadership” <http://www.enotrans.org/wp-content/uploads/wpsc/downloadables/NextGen-paper.pdf>, April 2012] Lin

The burden of increased fuel expenses is further exacerbated by airport congestion and existing inefficiencies in an aviation system that uses outdated technologies and protocols. Congestion is a problem, particularly at certain busy airports where the congestion is caused by capacity constraints, and will likely get worse as the economy recovers from the recession and travel demand rises. In 2010 major airlines reported that about 40 percent of arrivals and departures are delayed. Every additional minute spent by operators sitting on the tarmac or circling an airport awaiting clearance means additional fuel, equipment depreciation and maintenance, increased labor costs, employee fatigue, and a possible loss of customers. According to the latest FAA estimate, NextGen could save about 1.4 billion gallons of fuel through 2018. This estimate assumes continued benefits of some of the NextGen capabilities already in place at some airports and timely implementation of the FAA’s mid-term goals. This amounts to, on average, about 200 million gallons annually assuming full implementation of NextGen. Using the current jet fuel price of about $2.86/gallon in 2011, total fuel savings to operators would be about $600 million annually. However, the FAA has not made public the details of their estimation, simulation models, or methodology. Some industry experts may remain skeptical of the FAA’s estimates without a clear indication of the methodology or basis behind these figures. The following is a simple yet plausible independent measure of NextGen’s fuel savings. In 2010 the total fuel consumption by all US commercial airlines in domestic flights was 10.205 billion gallons of fuel worth $22.84 billion at an average fuel price of $2.24/gallon. Assuming a one percent improvement in fuel efficiency following NextGen implementation, which is a very conservative assumption, the resulting fuel savings amount to about 102 million gallons of fuel annually worth $229 million using the average 2010 fuel price. The savings from fuel also have environmental benefits. The 102 million gallons of fuel saved translates into reduced carbon dioxide emissions by approximately 1.076 million tons. This helps mitigate the airline’s industry impact on the environment and has real economic savings in a carbon offset market worth $7.9 million. Table 1 simply expands the figures for higher levels of fuel reduction. The results show that the benefits could be significant when only considering modest estimates of NextGen’ fuel efficiency. A more ambitious five percent fuel consumption reduction leads to about $1.145 billion dollars of fuel saved and 5.380 million tons of reduced carbon emissions annually.

####  Decreasing air traffic congestion would yield hundreds of millions in costs savings annually for aviation industry and passengers

Robert Poole 12,Director of Transportation Policy, http://reason.org/experts/show/robert-poole,”Air Traffic Control Reform News #92”, 4/19/12./jeong

A new policy paper, "NextGen: Aligning Costs, Benefits, and Political Leadership" was released by the Eno Transportation Foundation at an event April 4th, co-sponsored by the Bipartisan Policy Center. The presentation of the paper, by Eno CEO Joshua Shank and the paper's author, 2011 Eno Fellow Sakib bin Salam, was followed by a panel discussion by a number of long-time aviation policy people, all supportive of NextGen. I'm glad to see more attention being paid to ATC modernization, but I'm disappointed in this paper, for several reasons. It begins promisingly, by seeking to show that even modest improvements in air traffic flow should result in meaningful savings in fuel costs, reduced CO2 emissions, and traveler time savings, while improved surveillance should also produce significant safety benefits for general aviation (GA). The author assembled data from DOT and MIT to estimate current annual airline-specific delays, as well as airline-specific operating costs. Using that information, he produced spreadsheets quantifying the benefits from delay reductions of various percentages, from 1% to 35%, accruing to airlines and to passengers. Similar parametric calculations were applied to estimate GA fuel savings, time savings, and safety benefits (reduced deaths and aircraft damages due to fewer crashes). Selecting some sample figures from the author's tables, I used his annual dollar benefit figures for the case of 10% delay reduction for airlines and 5% for GA (as well as 5% safety improvements for GA), and added them up. The annual benefits to these beneficiaries were as follows: Airlines $1,078 million 54.8% Passengers $537 million 27.3% GA $352 million 17.9% Remember those numbers, because we will come back to them in a moment. The author next provides some estimates of NextGen costs, both FAA infrastructure costs and aircraft equipage costs. He does not attempt to relate costs to benefits, which is one of the major concerns of the ATC customer community, but let's leave that aside. The next (and longest) chapter delves into funding NextGen, first setting forth criteria for assessing various alternatives (since many, including me, are concerned that current aviation user taxes are unlikely to be sufficient). These criteria are equity, transparency, efficiency, and political feasibility. Five alternatives are considered: a tax on airline baggage fees, a higher tax on commercial jet fuel, a higher passenger ticket tax, a higher general fund contribution, and a separate airport-specific NextGen passenger fee that would be higher at the large hub airports where NextGen's impact is likely to be larger. His preferred approach is the airport-specific passenger fee. If you step back from this approach, it appears that equity has been given short shrift. Airlines get more than half of the benefits, and GA gets another 18%, but the poor passengers get stuck with paying the whole NextGen bill. How on earth is that equitable? I got a lot of positive feedback from last month's article in which I criticized a recent online screed claiming that it is passengers who should pay for ATC, not aircraft operators (for whom this is an ordinary operating cost), yet this report from a respected think tank essentially makes the same misguided recommendation. An even larger failing is that the report seems to consider the main problem with NextGen to be lack of funding. The author's PowerPoint from the April 4th event rightly notes GAO and Inspector General reports citing a long and continuing history of FAA cost overruns and program delays. A growing number of aviation stakeholders express concern that simply providing more funding, without more-fundamental reforms, would amount to "feeding the beast." They have concluded that the underlying problem is that the governance of the ATC system is poorly matched to the task. The FAA's Air Traffic Organization ought to be focused directly on meeting the needs of its aviation customers. Instead, its real customer is Congress, which provides its funding and to which it must be responsive. No other developed country so inherently politicizes the governance of its ATC system. In recent decades, nearly all developed countries have de-politicized their air navigation service providers (ANSPs), allowing them to operate as businesses, paid directly by their aviation customers, and in several cases (Canada, the UK), with aviation stakeholders on their governing boards. These (mostly governmental) ATC corporations have ready access to the bond market to raise the capital for modernization projects vetted as cost-effective by their customers. This approach is misleadingly labeled "privatization" in the report and therefore dismissed after three paragraphs as politically infeasible. In fact, what nearly all these countries have done is to reform in place the existing ANSP, changing its governance and funding, not turning it over to some outside private provider. Reforming the ATC system's governance and funding in this manner will resolve the questions regarding which technologies and procedures are worthwhile to aircraft operators and which are not. And thanks to access to the bond market and a bondable revenue stream, those capital improvements judged worthwhile can readily be financed.

#### Delays lead to cost overruns and hurts dependent systems - empirics prove

GAO 11 [The U.S. Government Accountability Office (GAO) is an independent, nonpartisan agency that works for Congress and investigates how the federal government spends taxpayer dollars. This paper was written by Gerald L. Dillingham, Ph.D., who is the Director of Physical Infrastructure Issues “NEXT GENERATION AIR TRANSPORTATION SYSTEM FAA Has Made Some Progress in Implementation, but Delays Threaten to Impact Costs and Benefits”http://www.gao.gov/assets/590/585588.pdf, 10-5-11]Lin

Some key acquisitions may soon encounter delays, which can increase overall acquisition costs, as well as costs to maintain current systems. For example, delays in implementing the ERAM program is projected to increase costs by $330 million, as well as an estimated $7 to $10 million per month in additional costs to continue maintaining the system that ERAM was meant to replace. Moreover, due to the integrated nature of NextGen, many of its component systems are mutually dependent on one or more other systems. For example, ERAM is critical to the delivery of ADS-B because ADS-B requires the use of some ERAM functions. ERAM is also pivotal to the on-time implementation of two other key NextGen acquisitions—Data Communications and SWIM. In part due to ERAM’s delay, FAA pushed the Data Communications program’s start date from September 2011 to February 2012, plans to revise the original SWIMsegment 1 cost and schedule plan, and delayed the SWIM-segment 2 start date from 2010 to December 2012. The long-term result of this decision is not yet known but it could delay certain SWIM capabilities and hinder the progress of other capabilities that depend, in turn, on the system integration that SWIM is intended to provide. Thus, looking more broadly, the implementation of NextGen—both in the midterm (through 2018) and in the long term (beyond 2018)—will be affected by how well FAA manages program interdependencies.

#### Delays in air traffic costs our economy $3 billion a year - NextGen key to increase traffic flow and to meet the future capacity increases

Tumer et al 07 (Kagan, and Adrian Agogino. Professor, Robotics and Control [Oregon State University](http://oregonstate.edu/),  PhD in [Electrical and Computer Engineering,](http://www.ece.utexas.edu/) from [The University of Texas](http://www.utexas.edu/), 97-06 was a senior research scientist in the [Intelligent Systems Division,](http://ic.arc.nasa.gov/) NASA Ames Research Center. *Proceedings of the Sixth International Joint Conference on Autonomous Agents and Multiagent Systems 2007, AAMAS '07: Honolulu, Hawaii, May 14 - 18, 2007*. Red Hook, NY: Curran, 2007. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.90.7793&rep=rep1&type=pdf)

The efficient, safe and reliable management of our ever increasing air traffic is one of the fundamental challenges facing the aerospace industry today. On a typical day, more than 40,000 commercial flights operate within the US airspace [14]. In order to efficiently and safely route this air traffic, current traffic flow control relies on a centralized, hierarchical routing strategy that performs flow projections ranging from one to six hours. As a consequence, the system is slow to respond to developing weather or airport conditions leading potentially minor local delays to cascade into large regional congestions. In 2005, weather, routing decisions and airport conditions caused 437,667 delays, accounting for 322,272 hours of delays. The total cost of these delays was estimated to exceed three billion dollars by industry [7]. Furthermore, as the traffic flow increases, the current procedures increase the load on the system, the airports, and the air traffic controllers (more aircraft per region) without providing any of them with means to shape the traffic patterns beyond minor reroutes. The Next Generation Air Transportation Systems (NGATS) initiative aims to address this issues and, not only account for a threefold increase in traffic, but also for the increasing heterogeneity of aircraft and decreasing restrictions on flight paths. Unlike many other flow problems where the increasing traffic is to some extent absorbed by improved hardware (e.g., more servers with larger memories and faster CPUs for internet routing) the air traffic domain needs to find mainly algorithmic solutions, as the infrastructure (e.g., number of the airports) will not change significantly to impact the flow problem. There is therefore a strong need to explore new, distributed and adaptive solutions to the air flow control problem.

#### And, reduced costs - transforming our Air Traffic Control system will save the airlines, government, and manufacturing industry hundreds of millions of dollars

Jansen 12,(Bart - http://travel.usatoday.com/flights/post/2012/04/nextgen/664954/1,”Report: Air traffic control improvements would save money”,4/4/12,editor at USA today news agency)

Improvements to the air-traffic control system could save hundreds of millions of dollars each year by consuming less fuel and reducing flight delays, according to an industry analyst's report released Wednesday. But airlines remain leery that the Federal Aviation Administration will follow through on improvements that justify buying more expensive equipment for planes, according to the report by Sakib bin Salam, a fellow at the Eno Center for Transportation, a nonpartisan Washington think tank. FAA has estimated that its program for improving air-traffic control, which is nicknamed NextGen, will make flight routes more precise by tracking planes with a satellite global-positioning system. Routes that are more precise could be shorter, reduce congestion and burn less fuel, saving airlines and passengers money. But according to bin Salam, FAA hasn't released how it estimated that the program would cost $15 billion to $20 billion to build through 2025, or how it estimated potential savings that eclipse those figures. To nail down estimates, bin Salam calculated that burning 1% less fuel would have saved U.S. airlines $229 million in 2010, when fuel was much less expensive than today. Reducing flight delays by 1% would save $39 million per year, based on the cost of flights and the length of delays, bin Salam said. The FAA projects much larger savings in fuel and delays. "Even at a minimum, the savings could be significant," bin Salam told industry experts at the Bipartisan Policy Center. Congress recently approved four-year legislation for FAA, but airlines remain skeptical that lawmakers will continue funding the equipment and training for NextGen as budgets tighten. Options for specifying money for the project, such as raising a passenger tax or a fuel tax, would meet fierce opposition on Capitol Hill. "There is a lot of uncertainty in the industry about how much NextGen might cost," bin Salam said. His report was released on the same day that FAA officials unveiled NextGen improvements in Houston. Acting FAA Administrator Michael Huerta said Houston flights are projected to fly 648,000 miles less per year and reduce carbon emissions 31,000 metric tons. For example, he compared landing now to walking down a flight of steps of descents and accelerations, while under the new system planes will glide almost at idle like sliding down a banister. "Through NextGen, the FAA and members of the aviation industry are teaming up to make some of the most complex airspace in the country some of the most efficient," Huerta said.

### Economy Adv Exts - Fuel Costs

#### High oil prices for jet fuel threatens airline industry

Sonya Bryskine 12, staff writer at the Epoch Times,http://www.theepochtimes.com/n2/business/oil-price-rise-to-squeeze-airline-industry-210674.html,”Oil Price Rise to Squeeze Airline Industry “, 3/27/12 /jeong

Airline profits are expected to plunge 14 percent in 2012 to $3 billion, as oil prices continue to soar, the International Air Transport Association (IATA) said this week. IATA has downgraded its profit prediction from the December forecast by $500 million. The ongoing eurozone debt crisis and rising oil prices have been the major risks for the airline industry, said Tony Tyler, IATA’s director general in a press release. The cost of Brent crude oil is forecast to reach $115 per barrel in 2012. This will push fuel to 34 percent of average operating costs and see the overall industry fuel bill rise to $213 billion. Political tensions in the Gulf region increase the risk of significantly higher oil prices, the implications of which could put the industry into losses, says IATA. Airline performance is closely tied to global GDP growth. Historically, when GDP growth drops below 2 percent, the global airline industry returns a collective loss.¶ “With GDP growth projections now at 2.0 percent and an anemic margin of 0.5 percent, it will not take much of a shock to push the industry into the red for 2012,” said Tyler.¶ Reflecting the decline in the industry, Emirates—the biggest airline by international traffic—announced that it expects more carriers to go bankrupt this year. “We can reel off a whole load of airlines that are teetering on the brink or are really gone,” Tim Clark, the Dubai-based carrier’s president, said according to Bloomberg. “Roll this forward to Christmas, another eight or nine months, and we’re going to see this industry in serious trouble.”¶ American Airlines is restructuring after filing for Chapter 11 bankruptcy and India’s Kingfisher Airlines Ltd. may lose its license as it struggles with cash shortages and losses. In Spain, Spanair SA collapsed on Jan. 27, while a Hungarian carrier Malev Zrt. also went bust this year.Clark said some private airlines will need to be bailed out by governments in the countries where they’re based, though that will raise aid issues with the European Union and other parties.¶ In the United States, more filings for Chapter 11 protection are likely, while smaller carriers operating in the Indian Ocean region and in Africa face “difficulties,” the executive said.

### Economy Adv Exts - Jobs

#### NextGen critical to uphold civil aviation; lack of air traffic control risks millions of jobs

Aerospace Industries Association of America 11(National Aerospace Week, “Aerospace and Defense: Second to None”, 9/17/11, AD: 07/09/12, <http://www.nationalaerospaceweek.org/wp-content/uploads/2010/04/whitepaper.pdf> | Kushal)

Civil aviation is an economic engine directly and indirectly contributing more than $1.3 trillion — or 5.6 percent of gross domestic product — to the U.S. economy. It supports nearly 11 million jobs with a payroll of $369 billion. 9 Civil aviation contributes positively to the U.S. trade balance, creates high paying jobs, keeps just-intime business models viable and connects all Americans to friends, family and business opportunities. All of that economic activity passes through the nation’s air traffic system. As long as the system can accommodate the rising demand for air travel and just-in-time express delivery, the growth of jobs and economic activity associated with civil aviation will continue. Our current system is safe, but antiquated and highly inefficient. We need to replace our 1960s-era air traffic control technology with a much more accurate and efficient 21st century satellite-based Next Generation Air Transportation System (NextGen). NextGen is essential to helping airlines return to profitability. It is critical for reducing fuel consumption and airplane emissions. Without NextGen, our national airspace will remain cluttered and inefficient and undermine the economic benefits of America’s commercial aviation industry. Excluding the costs of delays due to system inefficiency, failure to institute NextGen could cost the U.S. about $35 billion in annual economic loss by 2014 and as much as $52 billion in annual economic loss by 2024 — and that’s only in unmet demand and lost productivity. Businesses related to or dependent on aviation risk losing as many as two million jobs every five years if the nation doesn’t implement NextGen. 9 The Economic Impact of Civil Aviation on the U.S. Economy, FAA, Dec. 2009. 2011 Aerospace Industies Association of America, Inc. 6 The entire U.S. fleet of civil aircraft can be NextGen equipped in less than three years for less funding than has been committed to surface transportation infrastructure projects. Experts say with an equipped fleet and a commitment to accelerate supporting ground infrastructure, NextGen could be in place in five to eight years instead of 10 to 15. Full NextGen deployment requires the production and installation of hundreds of thousands of high-tech avionic products assembled by skilled workers in U.S. factories and maintenance stations in every state. Without these products, our National Airspace System cannot upgrade to satellite-based navigation and will lag behind systems in other countries. Building and deploying NextGen equipment, procedures and infrastructure could create approximately 153,600 jobs. 10 A viable aviation sector enhances economic activity in a wide number of industries outside aviation, including travel, tourism and industries that rely on just-in-time global inventories and shipping capability.

#### Next Gen could be a key job stimulator - would make the US a leader in the global aviation industry

Air Capital Insider News 09, Air Capital Insider News, http://blogs.kansas.com/aviation/2009/11/24/aviation-associations-tell-congress-nextgen-funding-will-spur-jobs/,”Aviation groups tell Congress NextGen funding will spur jobs". jeong

President Barack Obama and Congress are looking for ways to accelerate job growth and civil and travel associations have a suggestion: Fund the Next Generation Air Traffic Systems, commonly called NextGen.¶ The funding would finance switching the U.S. air traffic control system from ground-based radar to a satellite-based infrastructure. The change would create thousands of jobs for engineers, software developers and other high-tech workers, the groups say. Pilots, maintenance facilities and travel and tourism companies also would benefit from the change, they say.¶ The organizations sent a letter to House Transportation and Infrastructure Committee Chairman James Oberstar (D-Minn.) and Ranking Member John Mica (R-Fla.). It was signed by 19 associations, according to the Aircraft Owners and Pilots Association.¶ Besides job creation and boosting general aviation, the change would improve aviation safety, reduce delays and cut carbon emissions. It also would help keep the U.S. as a world leader in aviation, they say.¶ The European Union, Australia and Canada are surpassing the U.S. in implementing NextGen.¶ “Other countries like China and India will look to either the U.S. or Europe for leadership as they develop their air traffic control systems,” the letter said. “If the U.S does not demonstrate leadership in deploying these technologies, opportunities for U.S. manufacturers and workers will be lost.”

#### Next Gen is key to stimulating job growth and US competitivness - improving airline infrastructure will lead to job creation

US Senate Committee on Finance 2011

http://www.finance.senate.gov/newsroom/chairman/release/?id=2ed23bba-7453-4a0a-b8f5-972e62c561f6,Baucus Touts NextGen Job-Creation Benefits, Consumer Protections,2/3/11, United States Senate Committee on Finance. jeong

Washington, DC – Senate Finance Committee Chairman Max Baucus (D-Mont.) explored the potential for job creation, improved safety and reduced travel delays that could be realized from investments in NextGen, the new, satellite-based air traffic system, at a hearing today. Baucus has long worked to pass a long-term extension of the fund to provide the resources the Federal Aviation Administration (FAA) needs to improve air travel and modernize America’s airports, while supporting jobs throughout the air travel industry. ¶ “We cannot afford to neglect our aviation infrastructure,” Baucus said. “Modernizing our runways and air-traffic control will improve safety, protect consumers and create jobs. Modern and efficient aviation will reduce travel delays, lower costs and improve access to rural communities, including those in my home state of Montana.”¶ An FAA-commissioned report issued last year found flight delays cost the U.S. economy $32.9 billion in 2007. By 2030, the U.S. air-traffic system will handle an estimated 191,000 flights every day – an increase of 49,000 flights daily – and 1 billion passengers a year.¶ The Airport and Airway Trust Fund supports the FAA’s programs and activities, including the implementation of the NextGen satellite air traffic network, which will replace outdated radar systems. Baucus touted NextGen, the new GPS-based air traffic system, as a way to improve air safety and efficiency while advancing U.S. competitiveness and creating jobs. Reauthorizing the FAA legislation, with investments in NextGen, is estimated to create 280,000 jobs in airports throughout the country.¶ “NextGen’s precision will allow us to significantly upgrade our aviation infrastructure and better use our airspace. Implementation of the NextGen system is critical for millions of air passengers’ safety, for jobs and for advancing U.S. competitiveness,” Baucus said.¶ The Senate passed an FAA reauthorization bill last year by a 93-0 vote, but the bill expired when the 111th Congress adjourned. Congress will have to pass a new bill in the 112th Congress before the trust fund can be reauthorized.

#### Investing in the aerospace industry key to job creation

Blakely 12 [Marion C - president of the Aerospace Industries Association and former FAA Administrator, "350,000 Aerospace and Defense Workers' Jobs at Stake", February 13, http://traveltips.ulitzer.com/node/2164551] ttate

The budget released by the administration today is not a shot over the bow of the American aerospace and defense worker – it's a direct hit. As a result of the approximately $487 billion, ten-year cut to the defense budget alone, buying power to procure technologies that fuel U.S. military strength will be reduced in 2013 by approximately $20 billion. The American warfighter and our national security are not the only victims of this first, drastic result of the 2011 Budget Control Act. The budget released today takes direct aim at the first wave of 350,000 aerospace and defense workers who will be out of work if Congress does not find a solution to the sequestration trigger being pulled in 321 days. In the mean time, hundreds of companies that together form the "defense industrial base" have already begun to downsize in response to the cuts already enacted. And lest we forget, sequestration-driven budget cuts will most certainly hit the FAA and NASA as well. More aerospace companies and workers in all 50 states will share the pain of those 350,000 employees projected to be jobless following a $1 trillion cut to the defense budget. The solution to our country's budget crisis does not lie in further indiscriminate cuts to defense that put our country at risk and will throw hundreds of thousands of skilled workers out of their jobs. The solution does not lie in reversing progress toward safer, more efficient air travel made through investments to date in the FAA's NextGen air traffic management system. And renting Russian rockets to take American astronauts into space sends American space jobs offshore and poses an immediate threat to our country's goal of maintaining a space program that is second to none in the world. There is no rocket science to finding the only solution to America's budget crisis. Reform of entitlement programs and current tax policies are the only answers to a multi-trillion dollar budget deficit. The notion that adequate spending on our country's defense, infrastructure and future in space is in any way "discretionary" is, simply put, dangerous. The one-million aerospace and defense workers in America are proud, patriotic, well-educated and highly skilled. As the election season heats up, current and aspiring members of Congress will face these one-million voters who demand an answer to the central question of today's budget crisis – are those we elect to office prepared to make the tough decisions on realistic, long-term budget reform? The thousands of aerospace and defense workers who find themselves out of work this year as a result of the budget crisis will undoubtedly be the first to demand an answer.

### Economy Adv Exts - Unemployment high now

#### US job growth sluggish

Kevin, Carmichael 7-4-12, economics editor at The Globe and Mail, http://m.theglobeandmail.com/report-on-business/economy/economy-lab/less-firing-but-not-enough-hiring-in-us-jobs-market/article4099008/?service=mobile,”Less firing, but not enough hiring in U.S. jobs market “,7/4/12. jeong

The U.S. Labour Department’s monthly report Job Openings and Labour Turnover Survey generally attracts little notice. But anyone serious about studying the recovery should be paying closer attention. Federal Reserve chairman Ben Bernanke is.¶ Mr. Bernanke raised the profile of the JOLTS report considerably last month when he used the data to help explain why he’s skeptical the unemployment rate will continue to fall at a rapid pace.¶ Regina outpaces the rest of the country¶ U.S. jobless claims fall to lowest since 2008¶ Do we really know what's going on in the jobs market?¶ The survey measures employment, job openings, hires, quits, layoffs and other types of separations. The Labour Department is scheduled to release February data Tuesday morning at 10 a.m.¶ The lateness of the JOLTS figures explains the report’s lower profile. The Labour Department’s March estimate of non-farm payroll employment and the unemployment rate were released last week, as anyone who watches equity markets well knows.¶ Yet the delay allows for a clearer reading of labour market conditions. The monthly payroll numbers that attract so much attention are net figures: a tally of all the hiring and firing taking place each month.¶ As Mr. Bernanke pointed out to an audience in Washington last month, one side of that equation has improved dramatically. Layoffs have slowed considerably, allowing the unemployment rate to drop. However, for that momentum to continue, employers must boost their hiring. And that’s not happening.¶ There were 4.3 million job openings when the U.S. economy dropped into recession in December, 2007. That number bottomed at 2.2 million in July, 2009, and climbed back to 3.2 million in April, 2010. Job openings then slid a bit before getting back to three million in October, 2010. The figure climbed to 3.5 million in September of last year, and hasn’t moved much since.¶ That suggests employers are holding back from taking on new workers. The hiring rate was 3.3 per cent in March, 2011, and has oscillated between 3.1 per cent and 3.2 per cent ever since. In 2006, the hiring rate was never lower than 3.8 per cent.¶ “The declines in aggregate payrolls during the recession stemmed from both a reduction in hiring and a large increase in layoffs,” Mr. Bernanke said in a speech in late March. “In contrast, the increase in employment since the end of 2009 has been due to a significant decline in layoffs but only a moderate improvement in hiring. To achieve a more rapid recovery in the job market, hiring rates will need to return to more normal levels.”¶ Mr. Bernanke didn’t define a “normal” hiring rate. As the Labour Department’s chart of hiring rates over the past 10 years, the normal rate is probably considerably higher than then current 3.1 per cent. Between January, 2002, and the start of the recession in December, 2007, the hiring rate was never lower than 3.6 per cent.

#### US economy heading towards the cliff - unemployment is too high - creating jobs key to securing economic stability

Featherman, 12 (Bernard Featherman, economics writer for Journal Tribune, “Job creation will jumpstart the economy”, <http://www.journaltribune.com/articles/2012/07/12/columnist/doc4ffee21b22763301387879.txt>, July 12, 2012)

America is sitting on the edge of a fiscal cliff and unless changes are made, our economy may fall off it once more. Like Greece, Spain and Italy, our debt is great, our unemployment is high and our political will is wimpy. To prevent an economic collapse, we need to work on deficit reduction, job development and reducing regulations. No one has all the answers about what should be done, but we do know that job growth brings in tax revenues, while giving people the means to buy consumer goods. Creating more jobs, and getting more Americans employed, is our number one, most critical issue. Job declines remain at 8.2 percent and it is uncertain when they will drop lower. Without higher employment numbers, it will be difficult for the economy to get out of its doldrums. The government response is in a stall mode, with no quick fix in sight. Our economic engine needs retooling in education, manufacturing innovations and energy use in order to prevent a deep second recession. Education needs drastic improvement. Our schools are not doing a good job in math, science and high-tech innovations. Organization for Economic Cooperation & Development, an international organization of 34 countries, compares test scores in subjects such as math, for its 34-member nations. In 2010, the United States student scores ranked 24th. There are still plenty of well-paying jobs available in this country, but many of them require math, science, engineering or technology skills. A lot of businesses have to hire foreign workers, and bring them here, to fill their empty positions, because not enough of our young people have adequate training in technical areas. Part of the reason is that not enough teachers are strong in those subjects, and the other is that too few students are willing to take the necessary math and science classes. New teachers in those specialties will need to be hired and students need to be required, by state education departments, to take more classes in math and science, because the future, higher-paying jobs will be for those who have skills in those subjects. Many poor and middle-class families don’t have the money or lack incentives to encourage their children to go to college. For those who don’t go on for higher education, there are still many skilled vocational jobs that pay good wages in plumbing, electrical, carpentry, truck driving and skilled mechanics trades. Government service positions like police, fire department and commercial licensed skilled workers pay good wages for high school graduates, but the best paying jobs in the future will be given to college graduates with strong skills in math, engineering, health sciences and computer-related work. Manufacturing efficiencies, along with technological innovations, also are needed to revitalize our economy’s growth. Automation in manufacturing has resulted in fewer jobs. To prevent skilled job shortages resulting from layoffs, we need to develop incentives to help move unemployed workers and capital to new, growing sectors of the economy. We need to stimulate small business startups, neighborhood micro-businesses, and small business subcontractors, with manufacturer set-asides that will increase future job growth. Our government must also reassess the lowering of tax rates on American manufacturers, to match foreign countries’ rates that are much lower than ours. It can affect competitive exporting of more American- made goods to overseas buyers. We are still the most competitive manufacturing country in the world. Although our labor rates are high, foreign labor rates will continue to rise. And with reduced tax rates on American manufacturing companies, jobs will grow, even if our wages are higher than competition overseas. Energy savings advances in the future can result in using less energy in our daily lives and in our businesses. We are starting to drill more oil and gas wells in America, which will lessen dependence on foreign supply sources. Wind mills and solar energy are growing in our communities. We are supplying more natural gas for heating, which is cheaper than oil. Increased global demand will limit energy supplies in the next decade. Americans will face industry and home use shortages, unless restrictions on electricity consumption are put in place. One solution would be for more manufacturing, commercial and home users to buy electricity in off-peak hours, at lower rates, and store that electricity in special brick-lined tanks. What we need is less politics and more retraining and retooling for future jobs.

#### US labor market weak now - key variable in US economy

**Kurtzleben, 12** (Danielle Kurtzleben, business and economic reporter for the US News and World Report, “When an unemployment rate decline is bad news”, <http://www.usnews.com/news/articles/2012/05/04/when-an-unemployment-rate-decline-is-bad-news>, May 4th, 2012)

The U.S. economy added 115,000 jobs in April, with the jobless rate shifting down slightly to 8.1 percent, marking a slowdown from February's 259,000 jobs added and March's 154,000. The latest jobs number comes as a disappointment—many analysts had predicted growth of 160,000 jobs or more, and 115,000 is not quite enough to keep up with population growth. The incongruous unemployment rate decline accompanying such anemic job growth is a sign of a troubling trend: a shrinking labor force. The unemployment rate is calculated as a percentage of people either with jobs or looking for jobs. When that number shrinks, the unemployment rate can also fall, even without substantial job growth. In April, the labor force participation rate fell to 63.6 percent, the lowest it has been since 1981. "The drop [in labor force participation] has stayed there. It hasn't disappeared as the labor market has started to improve," says Matt Slaughter, associate dean of the Tuck School of Business at Dartmouth and a former member of President George W. Bush's Council of Economic Advisors. With such a prolonged dip in the participation rate, he says, there is now the question of whether this is the new normal. "How much of this big drop in the labor force participation rate will end up being permanent?" Slaughter says. One fear is that some workers who have dropped out of the workforce will be permanently off of payrolls, meaning that the U.S. economy loses their productive capacity for good. "If you look at how the employment numbers have gone over the last couple of years, many people have left the job market and have left the civilian labor pool. I think the big question is, will they come back?" says Scot Melland, president and CEO of Dice Holdings, which sponsors recruitment websites. "The fear is if those [who have dropped out] are people who need the income and have those skills ... that damages the U.S. economy overall if those people choose not to try to find a job again," Slaughter says. The April numbers continued recent industry trends, with certain industries showing continued growth and others remaining stubbornly weak. Healthcare and social assistance, which has grown steadily during the recovery, added 18,400 jobs, while professional and business services grew by 62,000 jobs. Meanwhile, construction lost 2,000 jobs and government shed 15,000, continuing their trends of shaky job numbers. "This has not been a broad-based labor recovery," Melland says. "There have been winning sectors and losers." Some unevenness between industries' growth rates is normal, but for a strong, stable recovery, there will need to be improvement even in the weaker sectors, says Slaughter. "Certain industries are growing faster than others," he adds. "But right now the challenge for the U.S. economy is that you need lots of industries expanding employment." That consistent weakness in particular industries could be one factor keeping some workers out of the labor force. A broader measure of the unemployment rate that includes people who have given up the job search, the U-6 rate, stopped its steady slide last month. That rate fell from 16.4 percent in September to 14.5 percent in March, where it remained in April.

### Economy Adv Exts - Business Confidence

#### Plan fuels business confidence - plan creates government certainty on a high-profile infrastructure project that eases business fears about US economy

Karp, senior editor @ AirTransport World, 2012 [Aaron, "US Chamber says NextGen ATC should be 'top priority'", AIR TRANSPORT WORLD, January 13, <http://atwonline.com/operations-maintenance/news/us-chamber-says-nextgen-atc-should-be-top-priority-0112>] ttate

US Chamber of Commerce president and CEO Thomas Donohue called on Congress to make transitioning to a satellite-based, NextGen air traffic control (ATC) system "a top priority."

Delivering his annual "State of American Business" address in Washington Thursday, the influential business lobbyist said upgrading ATC should be part of a "broader effort to modernize the nation's entire physical platform."

Financing for the NextGen system is tied up in long-stalled talks in Congress over FAA reauthorization; FAA's latest temporary funding extension expires Jan. 31 (ATW Daily News, Sept. 19, 2011). Donohue said that a "new NextGen air traffic control system ... will ease delays, conserve fuel, create jobs and save lives."

Government creating certainty on ATC and other infrastructure funding would be helpful to a US business community dealing with a slow recovery from the 2008-09 financial downturn, he said. "Unfortunately, we think the economy will actually slow down in the early months of the year," he warned. "We expect [US GDP] growth to average about 2.5% in the first half and then work its way back to about 3% by the end of the year."

He noted areas of apprehension for US business: "We are deeply concerned that our largest export market and commercial partner, the European Union, faces an unresolved financial crisis and a looming recession. There will be leadership transitions and elections in Taiwan, China, North Korea, Russia, France, Venezuela and Mexico—just to name a few. And in case you haven't noticed, there's an election coming up in the United States as well."

#### Stable funding key to private investors and capital

The Eno Center 12 [The Eno Center for Transportation is a neutral, non-partisan think-tank that promotes policy innovation and leads professional development in the transportation industry “NextGen: Aligning Costs, Benefits and Political Leadership” <http://www.enotrans.org/wp-content/uploads/wpsc/downloadables/NextGen-paper.pdf>, April 2012] Lin

In order for NextGen to succeed, there must be greater certainty about potential benefits and costs. In the highly competitive low profit-margin airline industry, few want to take on the burden of paying for something that spreads speculative benefits so widely. It will also be essential to have a mechanism that raises sufficient capital for NextGen infrastructure in a transparent and equitable manner, while imposing minimal burdens on those who pay for it. Without a sustainable, stable, and reliable strategy for both continued infrastructural improvements and incentives for equipage, there is no guarantee that NextGen can be implemented in a timely and cost-effective manner. Without strong political leadership, a clear and unbiased delineation of costs and benefits, a transparent source of funds, and incentives for operators to equip, it is unlikely that NextGen benefits can be delivered in a timely manner if at all.

#### **PPP’s key to success – investment spurs operator confidence**

GAO 11 [The U.S. Government Accountability Office (GAO) is an independent, nonpartisan agency that works for Congress and investigates how the federal government spends taxpayer dollars. This paper was written by Gerald L. Dillingham, Ph.D., who is the Director of Physical Infrastructure Issues “NEXT GENERATION AIR TRANSPORTATION SYSTEM FAA Has Made Some Progress in Implementation, but Delays Threaten to Impact Costs and Benefits”http://www.gao.gov/assets/590/585588.pdf, 10-5-11]Lin

To maintain credibility with aircraft operators that NextGen will be implemented, FAA must deliver systems and capabilities on time so that operators have incentives to invest in the avionics that will enable NextGen to operate as planned. As we have previously reported, a past FAA program’s cancellation contributed to skepticism about FAA’s commitment to follow through with its plans. That industry skepticism, which we have found lingers today, could delay the time when significant NextGen benefits—such as increased capacity and more direct, fuelsaving routing—are realized. A number of NextGen benefits depend upon having a critical mass of properly equipped aircraft. Reaching that critical mass is a significant challenge because the first aircraft operators to equip will not obtain a return on their investment until many other operators also equip. FAA Faces Several Ongoing Issues That Will Affect NextGen Implementation Stakeholders have proposed various equipage incentives. For example, one such proposal is for a private equity fund, backed by federal guarantees, to provide loans or other financial assistance to operators to help them equip, with payback of the loans dependent on FAA meeting its schedule commitments to implement capabilities that will produce benefits for operators. In addition, the NextGen Advisory Committee has begun to identify the specific avionics requirements for particular NextGen capabilities through the midterm, as well as identifying who—in terms of which parts of the fleet operating in which regions—should be targeted for additional incentives to equip.

### Economy Adv Exts - Government Investment

#### Government investment in transportation infrastructure stimulates the economy

**Cohen et al 12** [Isabelle - Thomas Jefferson Program in Public Policy @ The College of William & Mary, Thomas Freiling and Eric Robinson - same quals as main author, “THE ECONOMIC IMPACT AND FINANCING OF INFRASTRUCTURE SPENDING”, *Associated Equipment Distributors,* <http://www.aednet.org/government/pdf-2012/infrastructure_report.pdf>, January] mcclellan

In the long-run, our estimates suggest that investment in infrastructure continues to generate beneficial returns to the economy as a whole. To calculate the long-run effects of government investment in public infrastructure, we begin by taking into account the long-term relationship between types of infrastructure spending and overall economic output (GDP), as well as fluctuations in the value and depreciation of the current stock of infrastructure. This long-term relationship is based on the sensitivity of GDP to different types of public investment. After an exhaustive review of the relevant academic and professional literature which has previously sought to estimate this structural relationship between economic activity and public infrastructure investment, we use the vector autoregression (VAR) method explicated in Alfredo Pereira’s (2000) paper, Is All Public Capital Created Equal?, published in the Review of Economics and Statistics. This method produces an econometric determination of the long-run sensitivity of GDP to investment, a numerical value which captures the dynamic effects that GDP and investment spending each have on the other. We then adjust this natural sensitivity (or “elasticity”) for recent changes in the stock of different types of infrastructure. These processes allow us to calculate the long-run permanent effect of investment on GDP. Primarily, the econometric approach used by Pereira (2000) offers the most sophisticated and consistent means through which these long-run effects can be calculated. This method also allows for analysis of five different types of public infrastructure which are of interest to this study – highways and streets; transportation and power; sewer and water; health, educational, office, and public safety buildings; and conservation, development and nonmilitary equipment.

### Economy Adv Exts - Airline Industry key

#### **Aviation industry is the lynchpin to the US economy**

Aerospace Industries Association of America 11 (National Aerospace Week, “Aerospace and Defense: Second to None”, 9/17/11, AD: 07/09/12, http://www.nationalaerospaceweek.org/wp-content/uploads/2010/04/whitepaper.pdf | Kushal)

Aerospace and defense is a powerful economic engine. It is Second to None. As the U.S. economy continues to move through uncertain times and the nation grapples with a growing debt, America’s aerospace industry remains a powerful, reliable engine of employment, innovation and export income. Aerospace contributed $77.5 billion in export sales to America’s economy last year. 1 Conservatively, U.S. aerospace sales alone account for three to five percent of our country’s gross domestic product, and every aerospace dollar yields an extra $1.50 to $3 in further economic activity. 2 Aerospace products and services are the bedrock of our nation’s security and competitiveness. We strongly believe that keeping this economic workhorse on track is in America’s best interest. To accomplish this, government policies must support robust funding of defense priorities, research and development, a 21 st century air traffic control system, a level playing field abroad and a robust industrial base. Additionally policies that promote science, technology engineering and mathematics (STEM) will help reenergize an aging aerospace workforce with an infusion of younger employees. This paper explains what’s at stake and how to ensure that the economic and national security benefits of our industry are bolstered and broadened. It’s particularly important this year. With sixty percent of aerospace sales dependent on federal contracts, ill-considered budget cuts could jeopardize our national security, civil and space transportation infrastructure and economy. A High-Skilled People Business The aerospace and defense industry directly employs approximately 800,000 Americans, located in every state of the union — and supports more than two million jobs in related fields.

3 Our people bring a diverse set of skills and capabilities to their jobs: engineers on the cutting edge of advanced materials, structures and information 1 U.S. Department of Commerce. Aerospace Industries Association estimate. 3 U.S. Bureau of Labor Statistics, Quarterly Census of Employees and Wages, 2009 annual edition.

#### U.S. civil aviation industry key to the global economy

**DRI-WEFA 02** (DRI·WEFA, Inc., A Global Insight Company, “THE NATIIONAL ECONOMIIC IMPACT OF CIIVIIL AVIIATIION”, July 2002, AD: 07/13/12, <http://www.aia-aerospace.org/stats/resources/DRI-WEFA_EconomicImpactStudy.pdf> | Kushal)

Civil aviation has become an integral part of the U.S. economy. It is a key catalyst for economic growth and has a profound influence on the quality of life of populations around the globe. It integrates the world economy and promotes the international exchange of people, products, investment, and ideas. Indeed, to a very large extent, civil aviation has enabled small community and rural populations to enter the mainstream of global commerce by linking such communities with worldwide population, manufacturing, and cultural centers. Civil aviation products and services generate a significant surplus for the U.S. trade accounts and are in the forefront in the development and use of advanced technologies. Fundamentally, civil aviation touches nearly every aspect of our lives, and its success will, to a great degree, shape American society and the U.S. economy in the coming decades.

#### Aviation industry key component of US GDP

Richard, Anderson 11, Ceo of Delta Airlines,http://www.starstuddedsuperstep.com/2011/09/big-government-is-caging-u-s-airline-industrys-potential/,”Big Government is Caging U.S. Airline Industry’s Potential”, 4/13/11. jeong

At the world’s busiest airport, Hartsfield-Jackson Atlanta International Airport, an airplane takes off or lands about every 33 seconds. Airport activity contributes about $45 billion to the local economy. It’s a source of pride for Atlanta and just one example of the value that airlines provide to our nation’s economy. The industry’s continued success hangs in the balance, in great need of policy changes that will allow us to strengthen our business for our customers and our employees.¶ The U.S. airline industry contributes $750 billion to the Gross Domestic Product – surpassing contributions from the motor vehicle manufacturing, motion picture and paper-product industries. Net exports create more than 7 million jobs, and GDP created by the U.S. airline industry is topped only by oil and gas and farming as creators of economic value. And with more than 400 million leisure travelers and nearly 300 million business travelers int eh United States in 2010, it’s obvious that flying enables global commerce and makes nearly every major U.S. industry more effective. The destinations available to air travelers have expanded significantly, while the real price of an airplane ticket, including bag fees, has dropped 37% since 1993.¶ U.S. airlines use aircraft 17% more effectively than we did 20 years ago. Our nonfuel costs are 33 percent lower than they were 30 years ago. Yet despite having the lowest unit costs of any region’s carriers, U.S. airlines have lost $50 billion since 2000, while airline industries in every other region of the world have been profitable.¶ The industry’s great advantages are hindered by national policy. Labor, antitrust and merger laws stunt the industry’s ability to thrive. In stark contrast, foreign competitors enjoy great support from their own governments, along with below-market financing from the U.S. Export-Import Bank. This enables them to have newer, more efficient aircraft at rock-bottom costs. Foreign airlines have 1,157 wide-body aircraft slated for delivery over the next five years, compared to 55 for U.S. airlines.¶ China views aviation as a key economic development tool fueling its rise to international prominence. Japan has supported its struggling carriers, and pro-growth policies in Middle Eastern countries have their airlines buying as many new state-of-the-art aircraft as manufacturers can push off assembly lines.¶ The U.S. airline industry is at an inflection point and needs the support of the U.S. government to enable the benefits that airlines provide economies throughout the world. U.S. carriers have lost 30% of our international tourist traffic to foreign carriers since 1999. With Open Skies achieved in markets worldwide, U.S. carriers now need the opportunity to be sufficiently profitable so that we can buy the wide-body aircraft necessary to compete. And we need our government to act as an advocate by continuing to fight against markets still closed to us through slot controls. Finally, below-market financing of global carriers should end.¶ Delta and its peers have forged and re-forged business models through the intense fires of competition. We need a level playing field to keep us sharp for years to come. Policies that allow U.S. airlines to act as strong economic engines for our nation offer a better product for our customers, and they provide solid long-term careers for our employees. ¶

#### U.S. civil aviation industry key to the global economy

**DRI-WEFA 02** (DRI·WEFA, Inc., A Global Insight Company, “THE NATIIONAL ECONOMIIC IMPACT OF CIIVIIL AVIIATIION”, July 2002, AD: 07/13/12, <http://www.aia-aerospace.org/stats/resources/DRI-WEFA_EconomicImpactStudy.pdf> | Kushal)

Civil aviation has become an integral part of the U.S. economy. It is a key catalyst for economic growth and has a profound influence on the quality of life of populations around the globe. It integrates the world economy and promotes the international exchange of people, products, investment, and ideas. Indeed, to a very large extent, civil aviation has enabled small community and rural populations to enter the mainstream of global commerce by linking such communities with worldwide population, manufacturing, and cultural centers. Civil aviation products and services generate a significant surplus for the U.S. trade accounts and are in the forefront in the development and use of advanced technologies. Fundamentally, civil aviation touches nearly every aspect of our lives, and its success will, to a great degree, shape American society and the U.S. economy in the coming decades.

#### Civil aviation cornerstone of U.S. economy - key to national security

DRI-WEFA 02 (DRI·WEFA, Inc., A Global Insight Company, “THE NATIIONAL ECONOMIIC IMPACT OF CIIVIIL AVIIATIION”, July 2002, AD: 07/13/12, <http://www.aia-aerospace.org/stats/resources/DRI-WEFA_EconomicImpactStudy.pdf> | Kushal)

The importance of civil aviation to the economy, to the nation, and to the quality of life of Americans was made readily apparent by the terrible events of September 11, 2001. Layoffs and financial losses in civil aviation, its supplier industries, the tourism industry, and the broader economy rose sharply. As air traffic returns to pre-September 11 rates of growth—as projected in the Federal Aviation Administration’s (FAA) most current forecast1—air traffic delays will resume and increase dramatically.2 Congestion and delay, a function of capacity-constrained airport and airway infrastructure, not only will inconvenience passengers and shippers; it also will impose considerable costs on the United States as a whole. Conversely, investment in this infrastructure will foster economic growth and enhance safety and security. On November 27, 2001, just 11 weeks after the terrorist attacks, John Marburger, Director of the White House Office of Science and Technology Policy, reiterated the continued need for investment in the nation’s airports and airways in remarks to the Commission on the Future of the U.S. Aerospace Industry: “We need to develop a 21st Century global air transportation system that provides safe, secure, efficient and affordable transportation of people, goods, and information in peacetime and wartime—enabling people and goods to move freely anywhere, anytime, on time. **We need a system that: - Enhances national security by strengthening homeland defense while enabling the military to project power anywhere in the world at any time;** - Increases U.S. economic competitiveness by building a more efficient, higher capacity air transportation system; and - Improves the quality of life of all Americans by enabling them to do what they want to do when and where they want to do it.?3 This study addresses the economic competitiveness and quality of life benefits that Dr. Marburger describes. 1

#### **US aerospace industry key to US economy**

International Trade Administration(ITA) 11 [http://www.trade.gov/press/press-releases/2011/aerospace-industry-critical-contributor-to-us-economy-062111.asp,6/21/11.”Aerospace Industry is Critical Contributor to U.S. Economy According to Obama Trade Official at Paris Air Show”.] jeong

PARIS – Francisco Sánchez, Under Secretary of Commerce for International Trade, addressed national and international groups at the 2011 Paris Air Show to reinforce the President’s National Export Initiative (NEI) and support the U.S. aerospace industry. “The U.S. aerospace industry is a strategic contributor to the economy, national security, and technological innovation of the United States,” Sánchez said. “The industry is key to achieving the President’s goals of doubling exports by the end of 2014 and contributed $78 billion in export sales to the U.S. economy in 2010.” During the U.S. Pavilion opening remarks, Sánchez noted that the aerospace sector in the United States supports more jobs through exports than any other industry. Sánchez witnessed a signing ceremony between Boeing and Aeroflot, Russia’s state-owned airline. Aeroflot has ordered eight 777s valued at $2.1 billion, and the sales will support approximately 14,000 jobs. “The 218 American companies represented in the U.S. International Pavilion demonstrate the innovation and hard work that make us leaders in this sector,” said Sánchez. “I am particularly pleased to see the incredible accomplishments of U.S. companies participating in the Alternative Aviation Fuels Showcase, which demonstrates our leadership in this important sector and shows that we are on the right path to achieving the clean energy future envisioned by President Obama.” The 2011 Paris Air Show is the world’s largest aerospace trade exhibition, and features 2,000 exhibitors, 340,000 visitors, and 200 international delegations. The U.S. aerospace industry ranks among the most competitive in the world, boasting a positive trade balance of $44.1 billion – the largest trade surplus of any U.S. manufacturing industry. It directly sustains about 430,000 jobs, and indirectly supports more than 700,000 additional jobs. Ninety-one percent of U.S. exporters of aerospace products are small and medium-sized firms.

#### **Airline industry key to US economy - increasing demand without reforms means inevitable collapse in the status quo**

Poole 7. (Bill, member of the Alabama House of Representatives, “Executive Summary: The Urgent Need to Reform the FAA's Air Traffic Control System”, The Heritage Foundation Leadership for America, 02/20/07, <http://www.heritage.org/research/reports/2007/02/executive-summary-the-urgent-need-to-reform-the-faas-air-traffic-control-system>, 07/10/12, Chin/McClellan)

The U.S. economy depends on safe, reliable, and affordable air transportation. Beginning in 1978, airline deregulation transformed commercial avia­tion from a luxury for the few to a service available to essentially all Americans. U.S. companies depend on the airlines to transport their employees, and a growing number of all sizes make use of business aviation: corporate jets and turboprops, air taxi ser­vices, and fractional-ownership programs.¶ The FAA and other aviation experts predict seri­ous trouble over the next two decades, driven by continued aviation growth. First, a growing number of air travelers are flying in planes of smaller average size as narrow-body planes replace wide-body planes, regional jets replace narrow-body planes, and business jets replace regional jets. This is increasing the number of planes that the ATC system needs to control significantly faster than the number of air travelers is growing, exacerbating the FAA's funding problem. Second, this increased volume of air traffic will soon bump up against the inherent limits of the current air traffic control system.¶ The Joint Planning and Development Office (JPDO) has estimated that not expanding the sys­tem's capacity by 2020 will cost the U.S. economy $40 billion per year because the overburdened ATC system will force significant rationing of airline and business aviation flights. This will significantly increase the average price of the restricted flights, and some valuable trips will be eliminated entirely. The leaders of the U.S. Chamber of Commerce have said that, unless the United States acts soon to address this fundamental problem with aviation infrastructure capacity, the consequences could be "devastating." To avoid this crisis, they have called for designing and setting up an ATC system that can safely and efficiently handle this heavier demand.¶

#### Aerospace industry uniquely key to the economy - massive industry

Blakely 12 [Marion C. - president of the Aerospace Industries Association and former FAA administrator, "Sequestration: A countdown to disaster", April, http://www.bizjournals.com/washington/blog/fedbiz\_daily/2012/04/sequestration-a-countdown-to-disaster.html?page=all] ttate

The following came from Robert Stevens, chairman and CEO of Lockheed Martin during a keynote last month: “The aerospace and defense industry cannot wait until a lame duck session to deal with the consequences of sequestration. We are already taking action by not hiring and training new workers, not investing in new plants and equipment, and not investing in new R&D. An additional $53 billion a year in defense cuts starting in January 2013 would be catastrophic for our industry and our nation.” That is the reality this industry faces, even before the January 2013 cuts kick in. It comes after coverage of two staggering numbers tied to Maryland and Virginia: 63,321 and 159,000. The first number is the number of aerospace and defense jobs in these states, according to a report by Deloitte commissioned by the Aerospace Industries Association. The second figure – almost three times the first – is the number of total jobs at risk in these states if Congress doesn’t put a stop to the $1 trillion in defense cuts enacted in the budget deal last summer, according to a study led by local economist Dr. Stephen Fuller. Indeed, the damage from these cuts will reach far beyond the defense community – almost three American jobs lost for every aerospace and defense job eliminated. These are Main Street American jobs that grow from the $16 billion dollars in revenues aerospace and defense generates in Maryland and Virginia. They include small businesses, services, and spending that cut across the entire economy as Americans spend their paychecks on things like housing, food and healthcare. These are local businesses – “mom and pops” – not mega corporations. This is the danger confronting our states from the Budget Control Act of 2011, which cuts $1.2 trillion from the budget over 10 years starting Jan. 2, 2013. Nearly half of that will come from automatic defense “sequestration,” which is on top of $487 billion already being cut from defense through the appropriations currently underway. The rest will come from other discretionary – but critical – spending at such agencies as the Federal Aviation Administration and NASA. Scary figures. Even scarier is that our area is particularly vulnerable to this poison pill given the who’s-who of aerospace and defense businesses large and small that make metropolitan Washington, D.C. their home and give such a boost to the local economy. The findings in Deloitte’s study, The Aerospace and Defense Industry in the U.S.: A financial and economic impact study, are impressive: $324 billion in sales; a $42.2 billion positive trade balance – the largest of any industry. Between Virginia and Maryland, exports exceed $1.6 billion, cash income tax payments are nearly $119 billion and the average wage is $83,000 per year, almost twice the national average. All of this puts what’s at stake in a really glaring spotlight – like a surreal movie to say the least. There are many voices on both sides of the aisle in and out of government speaking out against sequestration. The ramifications go far beyond defense. AIA estimates the Next Generation Air Transportation System – replacing 1950s radar technology with a satellite-based system to guide air traffic – will be cut 30 to 50 percent. NASA’s programs to develop a new vehicle to get our astronauts to the space station, or out beyond earth orbit, are already under severe budget strain. Sequestration will mean additional years paying millions to the Russians to launch our astronauts to the International Space Station.

### Economy Adv Exts - Aerospace key to hegemony

#### Aerospace industry key to hegemony and global leadership

Kinne 11(Christopher, USAF Lieutenant Colonel, “Preserving the Industrial Base: Is the United States Air Force Responsible?” 2011, AD: 07/10/12, <http://www.aflma.hq.af.mil/shared/media/document/AFD-101122-031.pdf> | Kushal)

 Early in his first term, President George W. Bush established a bipartisan presidential commission to examine the future of the US aerospace industry.9 To ensure a broad, bipartisan effort, the President only appointed 6 of the 12-member commission. The other six were appointed by the leadership of the US House of Representatives and the US Senate. The commission was chartered on July 19, 2001, to “study the issues associated withthe future of the United States aerospace industry in the global economy, particularly in relationship to United States national security. [They were also chartered to] assess the future importance of the domestic aerospace industry for the economic and national security of the United States (emphasis added).” The commission was asked to study a broad spectrum of topics. The budget process of the US government. The acquisition process of the government¶ • The financing and payment of government contracts¶ • International trade and the export of technology¶ • Taxation¶ • The national space launch infrastructure¶ • Science and engineering education11¶ The commission had a great deal to say about these topics.¶ After months of meetings and discussions covering the broad¶ spectrum of topics, the commission published its final 300-plus¶ page report in November 2002. The commission report begin with a positive statement about the US aerospace industry and claims in its opening sentences that “the role of aerospace in establishing America’s global leadership was incontrovertibly proved in the last century…[and] aerospace will be at the core of America’s leadership and strength in the twenty-first century.”12¶ However, the report also includes nine recommendations that¶ address many concerns of the aerospace industry and the panel¶ members themselves. The commission identified several trends¶ it believed must be corrected to both preserve the US aerospace¶ industry and to improve US national security. Most importantly,¶ the commission observed: “The contributions of aerospace to our global leadership have been so successful that it is assumed US preeminence in aerospace remains assured. Yet the evidence would indicate this to be far from the case.”13 In highlighting its concern about the future preeminence of the US aerospace industry, the commission observed: “The US aerospace industry has consolidated to a handful of players— what was once more than 70 suppliers in 1980 is down to 5 prime¶ contractors today. Only one US commercial prime aircraft¶ manufacturer remains. Not all of these surviving companies are¶ in strong business health.”14 The commission also noted: “New¶ entrants to the industry have dropped precipitously to historical¶ lows…[and] the industry is confronted with a graying workforce¶ in science, engineering, and manufacturing…[and] the US K-12¶ education system [is failing] to properly equip US students with¶ the math, science, and technological skills needed to advance¶ the US aerospace industry.”15¶ Addressing part of the national security issue, the commission¶ noted:¶ Other countries [specifically in Europe and Asia] that aspire for a¶ great global role are directing intense attention and resources to foster¶ an indigenous aerospace industry. This is in contrast to the attitude¶ present here in the United States. We stand dangerously close to squandering the advantage bequeathed to us by prior generations¶ of aerospace leaders…. A healthy aerospace industry is a national imperative. The administration and the Congress must heed our¶ warning call and act promptly to implement the recommendations¶ in this report (emphasis added).16

### Economy Exts - Next Gen modernizes aviation infrastructure

#### NextGen revolutionizes air traffic control infrastructure - would stimulate economic recovery

McGee 11(Bill McGee, a contributing editor to Consumer Reports and the former editor of Consumer Reports Travel Letter, is an FAA-licensed aircraft dispatcher who worked in airline operations and management for several years, “”Five ways to improve air travel (that government won't act on)”, 10/26/11, AD: 07/14/12, <http://travel.usatoday.com/experts/mcgee/story/2011-10-26/Five-ways-to-improve-air-travel-that-government-wont-act-on/50925900/1> | Kushal)

Regardless of which airline you choose, you're likely to be confronted by a flight delay or cancellation that saps your time, money and patience. According to the U.S. Department of Transportation, more than 20% of domestic flights were delayed in 2010, and each month thousands of regularly scheduled flights are either canceled or chronically delayed 70% of the time or more.¶ Now consider that the United States, for all its power and wealth, is dependent upon an outdated air traffic control network that relies on radar rather than satellite-based technology. And further consider that the solution has been a political football, and the punting has continued for years now, ever since a new methodology was proposed in 2003.¶ Benefits abound ¶ It's called the Next Generation Air Transportation System - better known as NextGen -- and by employing satellite and data technologies it's designed to reduce flight delays 35% by 2018. The Federal Aviation Administration site provides more background information—in both text and video formats—than most air travelers would ever need.¶ For consumers, the simple fact is the FAA promises that modernizing the nation's antiquated air traffic control system would bring immediate and lasting advantages. Here are the top five benefits for air travelers:¶ 1. A more efficient airline network with fewer flight delays, both in the air and on the ground¶ 2. Fewer flight cancellations, providing passengers with savings in both money and time¶ 3. Less time en route from Point A to Point B, aided by more direct flight paths, thus reversing the "padded flight times" trend I wrote about here in 2009¶ 4. An enhanced level of safety "to better predict risks and then identify and resolve hazards"¶ 5. Fuel savings and a reduction in aviation's carbon footprint, not just by lowering fuel emissions but also by curbing noise¶ What's more, these efficiencies and economic benefits would also flow to airlines, corporate customers and communities as well, thereby strengthening the nation's economy.¶ So the only pressing question concerning NextGen would seem to be: What's holding it up? The answer, of course, is funding, and neither the U.S. Government nor the airline industry has quite resolved this issue. In the meantime, the traveling public keeps waiting for NextGen.¶ Footing the bills ¶ Support for NextGen crosses party lines and transcends political ideologies. As far back as 1997, Vice President Al Gore was calling for air traffic control modernization that would "make the notion of 'highway lanes in the sky' as obsolete as the bonfires that used to guide early fliers." The Reason Foundation points out that "the technology the (FAA) uses to navigate $200 million jets is less advanced than the GPS technology drivers use to navigate $20,000 cars."¶ A key roadblock has been Congress. Critics on both sides of the aisle complain that the lack of long-term and sustained funding for the FAA is crippling big-picture capital improvement projects such as NextGen. Last summer, Congressional bickering prevented an extension of funding for an FAA Reauthorization bill and led to a temporary "shutdown" of non-essential FAA funding. That incident underscored that the FAA has been working without a long-term reauthorization since 2007, and has been temporarily funded more than 20 times in five years.¶ Such dysfunction only serves to keep all of us flying through a technological time warp while other nations modernize their own air traffic systems. Little wonder the National Air Traffic Controllers Association has called for "clarity and accountability" and states: "Right now, NextGen is little more than a very ambitious research and development project."¶ But the airlines bear responsibility as well. The industry's largest trade group, the Air Transport Association, has repeatedly called for more NextGen funding from Congress. Of course, the stickier issue is the investment the airlines themselves need to make by equipping their own aircraft. This dance between government and industry has been playing out for years now; in 2010, for example, US Airways CEO Doug Parker was quoted in news reports as saying, "Our position is so long as we have to pay for [new equipment], we prefer not to have it."¶ Yet in February, the U.S. Department of Transportation found $4.2 million to help JetBlue equip 35 of its aircraft with NextGen capabilities. JetBlue CEO David Barger happens to be the Chair of the NextGen Advisory Committee, serving alongside FAA representatives. But clearly not all domestic airlines will see Uncle Sam pick up the tab for their NextGen equipage investments.¶ Of course, there is strong support from the DOT itself. Last year when I served on the DOT's Future of Aviation Advisory Committee, NextGen was the only issue addressed by all five subcommittees—Competition, Environment, Financing, Labor and Safety. In fact, among our final 23 recommendations, five were devoted to NextGen, asserting that NextGen will provide tangible benefits to travelers.¶ MCGEE: What I learned serving on the government's Future of Aviation panel¶ However, earlier this month, the Government Accountability Office told Congress that the FAA needed to improve its efforts to manage and govern NextGen, and to ensure the environmental benefits are certain. So challenges remain.¶ What about passengers? ¶ For years now it has struck me how little interest NextGen has developed with consumer media and the public. I suspect it is because NextGen is a rather monolithic beast, involving thousands of upgrades to equipment on the ground, on board airplanes and even in space. It's long and tedious work, not conducive to ribbon-cutting or champagne-popping. Unlike President Kennedy's clarion call for a moon landing, the goals of NextGen are diffuse and varied, and spread out over time and distance.¶ But the irony is that improving America's air traffic control system will provide direct benefits for so many of those who have never even heard of NextGen. For now, airline passengers will continue to wait. And much of that waiting will take place onboard commercial flights.

### Economy Exts - Next Gen key to solving congestion

#### Next Gen is vital to the survival of the aviation industry - it will be able to solve congestion from increased capacity - vital to economic growth

Kramer 05-22-2012 [Hillary - stock broker and financial contributor to *Forbes*, "Building the runway to the skies of tomorrow", http://www.forbes.com/sites/hilarykramer/2012/05/22/building-the-runway-to-the-skies-of-tomorrow/] ttate

It seems that these days, the general public is a bit weary of commercial air travel – and who can blame them? We hear countless stories of TSA screeners taking their jobs perhaps too seriously, to say nothing of the general unpleasantness and inconvenience of arriving 90 minutes early to your flight, removing your shoes and getting full-body scanned. Despite these admitted irritations, I think it’s important to take a step back and realize just how complex and technologically sophisticated an achievement it is – even a miracle, you might say – that we, the traveling public, make it safely from departure gate to arrival gate day-in and day-out. It’s really quite impressive, especially considering that today’s air traffic network is based on systems developed more than 60 years ago. This is both good news (that the network is resilient) and bad (the network is old). Demand for air travel – and the resulting pressure this demand places on the existing aviation network – is imminently on the verge of exceeding our system’s limits. Consider that in 1995, our air-traffic management system accommodated 580 million passengers per year on 30,000 flights per day. Just 15 years later, in 2010, those numbers jumped to 712 million passengers per year on 43,000 flights per day. The Federal Aviation Administration (FAA) estimates that, if left unaddressed, increased air congestion could cost the American economy $22 billion annually in lost market activity by 2022. The reason for this is simple: Aviation is now the premier enabler of global commerce. $562.1 billion in goods were transported in 2008 alone; $249.2 billion was spent on direct expenditures by air travelers in 2009, the same year in which aviation made up 5.2 percent of total U.S. GDP. This is a staggering reality. If technology cannot keep up, the entire industry will face massive economic and logistical difficulties that will affect millions of travelers and businesses annually. The entire fabric of global connectivity is at risk. Thankfully, though, innovation and technology are advancing at a rate faster than any previous generation thought possible. We now live in a world whose aviation technology needs are light-years ahead of those in which our current systems were first implemented. The landscape has changed, and our aviation technology must change with it if we are to address the aviation challenges of tomorrow – not only for the airlines and the air travel market, but for the traveling consumer as well. The technology is there, in the form of what the FAA calls the Next Generation Air Transportation System, or NextGen. NextGen is unique in that it represents an incremental but innovative and integrated system that will vastly improve efficiencies for both the traveling public and the aviation industry. It moves air-traffic management systems away from ground-based radar, instead relying on more advanced satellite-based technology to accommodate continued growth and increased safety. By switching to GPS-based systems, airlines can get more planes in the air; these planes can fly, safely, in closer proximity to each other; and the airlines can run more routes, getting more people to more places more quickly. According to the FAA, “This evolution is vital to meeting future demand, and to avoiding gridlock in the sky and at our nation’s airports.” If fully implemented, FAA analysts indicate that NextGen is expected to save $123 billion in costs by 2030. And, as a bonus, NextGen is expected to significantly reduce aviation’s impact on the environment by allowing for more direct routes. In fact, according to the International Air Transport Association, cutting flight times by just one minute per flight on a global basis – something that NextGen technology would easily make a reality – would save 4.8 tons of carbon dioxide emissions every year. The private sector has a role to play here as well, particularly companies like Boeing, Booz Allen Hamilton, Exelis and Raytheon. Ultimately, NextGen’s success will depend on the leadership and contribution of these and a handful of other companies that are playing a central role in its development and the overall evolution of air-traffic management. But while technology is the inanimate core of NextGen, the benefits of these new systems and technologies will never be realized without air traffic controllers and other aviation industry professionals who undergo efficient and successful training, which is arguably the most critical element to NextGen. (After all, the new technology is rather useless if no one knows how to properly operate it.) At first, training does seem to be a huge challenge as we look forward to the implementation of this next generation of global air traffic technology. But, it actually won’t be so ominous and will ultimately be a very beneficial process integrally woven into NextGen. In fact, Raytheon (RTN), in particular, comes to mind for its role in providing training. Active in air-traffic management for over 60 years, Raytheon is a major player in providing both systems and training for all dimensions of air-traffic control. Currently, Raytheon trains allU.S.air-traffic controllers, in addition to providing 60 percent of all air-traffic control training worldwide. Raytheon has delivered more than 350 air-traffic management systems to more than 60 countries, and companies like Raytheon will be critical partners for the FAA as the agency continues to implement (and require training for) NextGen technologies. Of course, while all of this sounds great in theory, NextGen has had its bumps in the road along the way. Cost has been one of the more contentious issues, with the FAA and the airlines currently embroiled in a tug-of-war when it comes to picking up the $29 – 42 billion check. Despite challenges in its development and execution, it is vital that NextGen be implemented as rapidly as possible in order to ensure the ability of U.S. aviation systems to meet traveler and cargo demand, achieve efficiencies and minimize the impact of aviation on the environment. Simply put, NextGen will succeed if it can equip the talented individuals who manage and oversee America’s airspace to meet the growing demands of tomorrow’s aviation challenges – all while ensuring you and I make it safely, happily and more efficiently to our arrival gate.

### Economy Exts - Next Gen decreases costs

#### Aviation key to the economy - Next Gen key to reducing congestion and costs

ENO 12 (Eno Center for Transportation, “NextGen: Aliging Costs, Beneftis, and Political Leadership”, 04/05/12, AD: 07/14/12, <http://www.infrastructureusa.org/nextgen-aliging-costs-beneftis-and-political-leadership/> | Kushal)

The aviation system that is part of the life-blood of our economy is poised to face rising demand with limited additional capacity and outdated technology. This could put considerable stress on the system in terms of congestion and efficiency. The Next Generation Air Transportation System (NextGen) represents a series of incremental policies, procedures, and technological changes to modernize the air traffic control (ATC) system into a more efficient, state-of-the-art satellite-based system. On the technology side, NextGen is composed of two main components: aircraft based equipment that records and transmits the exact location of the aircraft using Global Positioning System (GPS), and ground based infrastructure that can receive and analyze the GPS data. Infrastructural improvements also entail devising more direct and fuel-efficient routes, and upgrading the computer and backup system used at 20 Federal Aviation Administration (FAA) air traffic control centers nationwide. The infrastructure implementation is currently in the hands of the FAA and funded by the Airport and Airway Trust Fund (AATF), while aircraft equipage is expected to be paid for by the operators.¶ On-board equipage could allow improved decision-making capabilities and accessibility during adverse weather, as well as better data communications between cockpit and ATC. This more precise system has the potential to reduce the minimum aircraft separation standard and allow more direct flight patterns, thus decreasing fuel consumption, carbon emissions, and congestion.¶

#### NextGen implementation guarantees efficiency and savings

Jansen 12(Bart, staff writer for USA Today, “ Report: Air traffic control improvements would save money”, 4/4/12, AD: 07/14/12, <http://travel.usatoday.com/flights/post/2012/04/nextgen/664954/1> | Kushal)

Improvements to the air-traffic control system could save hundreds of millions of dollars each year by consuming less fuel and reducing flight delays, according to an industry analyst's report released Wednesday.¶ But airlines remain leery that the Federal Aviation Administration will follow through on improvements that justify buying more expensive equipment for planes, according to the report by Sakib bin Salam, a fellow at the Eno Center for Transportation, a nonpartisan Washington think tank.¶ FAA has estimated that its program for improving air-traffic control, which is nicknamed NextGen, will make flight routes more precise by tracking planes with a satellite global-positioning system. Routes that are more precise could be shorter, reduce congestion and burn less fuel, saving airlines and passengers money.¶ But according to bin Salam, FAA hasn't released how it estimated that the program would cost $15 billion to $20 billion to build through 2025, or how it estimated potential savings that eclipse those figures.¶ To nail down estimates, bin Salam calculated that burning 1% less fuel would have saved U.S. airlines $229 million in 2010, when fuel was much less expensive than today. Reducing flight delays by 1% would save $39 million per year, based on the cost of flights and the length of delays, bin Salam said. The FAA projects much larger savings in fuel and delays.¶ "Even at a minimum, the savings could be significant," bin Salam told industry experts at the Bipartisan Policy Center.¶ Congress recently approved four-year legislation for FAA, but airlines remain skeptical that lawmakers will continue funding the equipment and training for NextGen as budgets tighten. Options for specifying money for the project, such as raising a passenger tax or a fuel tax, would meet fierce opposition on Capitol Hill.¶ "There is a lot of uncertainty in the industry about how much NextGen might cost," bin Salam said.¶ His report was released on the same day that FAA officials unveiled NextGen improvements in Houston.¶ Acting FAA Administrator Michael Huerta said Houston flights are projected to fly 648,000 miles less per year and reduce carbon emissions 31,000 metric tons. For example, he compared landing now to walking down a flight of steps of descents and accelerations, while under the new system planes will glide almost at idle like sliding down a banister.¶ "Through NextGen, the FAA and members of the aviation industry are teaming up to make some of the most complex airspace in the country some of the most efficient," Huerta said.

#### Next Gen provides an economic stimulus for the airline industry - decreases delay costs and fuel costs

Dan Lipinski 12,http://www.lipinski.house.gov/press-releases/lipinski-urges-passage-of-aviation-reauthorization-that-will-create-jobs-and-reduce-delays-locally-and-nationally/,”Lipinski Urges Passage of Aviation Reauthorization that Will Create Jobs and Reduce Delays Locally and Nationally “,2/1/12,US congressman/ jeong

Today, Congressman Dan Lipinski (IL-3) urged his colleagues to pass the long-term Federal Aviation Administration reauthorization that he helped write to create jobs, save money, and reduce air traffic delays. The bill includes language authored by Rep. Lipinski to expedite the rollout of the NextGen satellite navigation system, which will reduce delays by an estimated 35 percent, save $23 billion, and prevent pollution and noise, both locally and across the nation. It also includes legislation Rep. Lipinski wrote to develop alternative forms of fuel for aircraft to help reduce our dependence on foreign oil, and to promote recycling at airports, which are huge generators of waste. "After a five-year delay, a long-term reauthorization of the FAA is now within reach," Rep. Lipinski said. "Passage of this measure is of critical importance to the Chicago region, which depends on Midway and O’Hare airports for $45 billion in economic activity and 540,000 jobs. It will also provide grants for which smaller airports can compete, such as Lewis University Airport, which is upgrading its runways and planning for increased utilization to attract new companies, jobs, and economic growth. Aviation delays already cost an estimated $9.4 billion annually, and with the number of passengers expected to increase to 1 billion in less than a decade, they will only get worse unless action is taken. Everyone in northeastern Illinois knows we need to cut down on the delays that plague our airports. This bill is absolutely essential to achieving that goal." The FAA oversees the planning of the national airport system and provides funding for airport improvements, employs 35,000 air traffic controllers and technicians to guide America’s 50,000 daily flights, and is responsible for regulating the aviation system and certifying America’s pilots, mechanics, and aircraft. The last long-term reauthorization of the Federal Aviation Administration expired in 2007. Since then, Congressman Lipinski has been pushing to reauthorize the FAA, and voted Tuesday to go to conference to reconcile the differences between the reauthorizations passed by the House and Senate. An agreement was reached last night. The benefits of NextGen for northeastern Illinois and the country as a whole are many. By replacing the current outdated radar-based navigation system with GPS and other advanced technology, NextGen will help aircraft to fly shorter routes and reduce descent times. This will save about 1.4 billion gallons of fuel through 2018 along with 14 million tons of carbon dioxide emissions, and result in less noise for those living near airports. At the same time, more precise routes and descents, along with improved communications through NextGen, will reduce frustrating delays for passengers and businesses and expand the capacity of our airports in the Chicago area and around the country. Total savings by 2018 for airlines, the public, and the FAA are estimated at $23 billion. Rep. Lipinski’s NextGen amendment requires the FAA to develop a plan for a public-private partnership to expedite the equipping of aircraft with NextGen technology. While federal investments have led to advances, much more work is needed to develop commercially viable forms of aviation fuel that are environmentally friendly and move us away from dependence on foreign oil. Rep. Lipinski’s amendment requires the FAA to continue working with NASA to develop an unleaded fuel for piston-engine aircraft. Almost four decades after unleaded gasoline for automobiles was first introduced, it is time to get rid of lead in aviation fuel. Language he wrote also requires the FAA to work with the private sector, academia, and other government agencies to develop jet fuels from clean alternative sources such as biomass and hydrogen. U.S. airports generate an estimated 7.5 million pounds of trash every day – as much or more than a mid-size city – yet recent estimates indicate only a fraction is recycled. To increase recycling at airports, Rep. Lipinski authored an amendment that requires airports to study the feasibility and potential cost savings of increasing their recycling whenever they update their master plans. "For the sake of our economy and jobs, both locally and nationally, we need to pass the FAA reauthorization," Rep. Lipinski said. "And for the sake of our environment, health, and national security, it should include efforts to decrease harmful emissions, waste, and dependence on foreign oil."

### Economy Exts - Next Gen key to jobs

#### Next Gen will spur job creation

Mica 2012 [John L. - Chairman, House Transportation and Infrastructure Committee, "Air Traffic Control Modernization (NextGen)", House Transportation and Infrastructure Committee, http:// <http://republicans.transportation.house.gov/singlepages.aspx/1558>] jeong

On February 14, 2012, a major Committee initiative to improve the nation’s airport and aviation infrastructure, create jobs, modernize our antiquated pre-World War II air traffic control system, improve aviation safety, and save taxpayers money through significant reforms of the Federal Aviation Administration (FAA) was signed into law.¶ The FAA Modernization and Reform Act of 2012 (H.R. 658) sets the long-term federal policy for a vital segment of the nation's economy. This measure was introduced in the House by Transportation and Infrastructure Committee Chairman John L. Mica and Aviation Subcommittee Chairman Tom Petri (R-WI).¶ The nation’s air traffic control system is still dependent on radar technology, first developed prior to World War II. NextGen is the long-term modernization project that includes replacing ground-based radar with GPS and satellite-based surveillance. Ensuring that NextGen is successfully developed will reduce air traffic delays, cut down on emissions and pollution, and lower costs for consumers.¶ In addition, without adequate oversight and guidance, the potential for wasting taxpayers’ money through a poorly managed NextGen program is substantial.¶ Important provisions in the FAA Modernization and Reform Act provide a blueprint for Next Gen, setting milestones and metrics, and helping improve management and accountability for this ongoing project:¶ Prioritizes programs for developing the nation’s Next Generation Air Traffic Control System (NextGen), which will modernize our antiquated technology and improve aviation efficiency; Reforms NextGen governance to assure accountability for progress in this important modernization project –¶ Establishes a Chief NextGen Officer as the single point of accountability for NextGen Implementation at FAA.¶ Raises the position authority of the interagency FAA planning officer to an Associate Administrator level.¶ Requires biannual meetings of the Cabinet Secretaries in charge of delivering NextGen, raising senior level accountability for NextGen progress.¶ Lack of FAA standards on NextGen avionics have hindered job growth in avionics manufacturing. The bill sets deadlines for FAA action to develop standards for GPS-based avionics that will replace radar;¶ Sets deadlines for FAA action on publishing more efficient GPS-based flight paths, and streamlining environmental reviews;¶ Establishes objective performance metrics for the national airspace system that will be used to measure FAA’s progress in delivering NextGen benefits;¶ Provides for the inclusion of aviation stakeholders in the development of NextGen;¶ Authorizes public private partnerships providing financial instruments to incentivize NextGen avionics equipage;¶ Directs the FAA Administrator to develop operational incentives for NextGen equipage.

#### Next Gen key to US economic growth - spurs job creation and decreases costs for the industry and passengers

United States Department of Transportation USDOT 10, http://fastlane.dot.gov/2010/03/aviation-expansion-forecast-adds-to-case-for-nextgen.html#.UAGNdPV41h4, "Aviation expansion forecast adds to case for NextGen", 3/10/10. jeong

At yesterday's announcement of FAA's Aerospace Forecast, FAA Administrator Randy Babbitt made an important common-sense point: "It is unwise to make long-term decisions with short-term information."¶ For us at DOT, that means we don't stand still when times are tough; we take advantage of the opportunity to position our nation's transportation systems for the future.¶ NextGen-blog¶ Administrator Babbitt's point underscores the need to continue planning for significant air traffic expansion. Indeed, while our forecasters see a small net contraction this year in total airspace operations--continuing the contraction from 2008 to 2009--over the next 20 years they predict annual growth (2.5%) in the number of domestic passengers and the number of takeoffs and landings (1.5%). Federal\_Aviation\_Administration\_logo By 2023, our air traffic control system will be expected to manage flights carrying over one billion passengers each year. And the key tool to manage that expansion is NextGen.¶ I don't want to go too deeply here into the various components of our NextGen modernization of air-traffic control (you can read more about it here). But I will say that our transition to this satellite-based system is a winner for safety, efficiency, and the environment. NextGen offers data communication improvements that reduce reliance on voice communications and significantly reduce the risk of misunderstanding between pilots and controllers. That means greater safety. By 2018, we expect NextGen to reduce total flight delays by 21% and save over 1.4 billion gallons of fuel--a saving that cuts CO2 emissions by 14 million tons.¶ Sm-aviation So, while the economy was on 'pause,' this DOT has been leaning on the 'fast-forward' button, aggressively modernizing your air-traffic control system for the long-term expansion ahead.¶ Yesterday's forecast is both encouraging and challenging. Of course, we look forward to renewed economic growth and the jobs it brings. But as the economy returns to growth, so does aviation--in leaps and bounds.¶ The FAA is prepared to manage that growth. With our budget request for additional positions to develop safety standards and provide increased aircraft certification services. With our landmark labor agreement negotiated last summer with air traffic controllers. With our future of aviation forum. And with NextGen.¶ Look, there can be turbulence on any flight. But we think we've mapped a route that takes us smoothly into the future.

#### Implementation of NextGen will stimulate job growth - construction industry

Greg Sleter 12 - editor at smithtownpatch, http://smithtown.patch.com/articles/officials-say-new-atc-facility-would-save-create-jobs,”Officials Say New ATC Facility Would Save, Create Jobs “. jeong

With the Federal Aviation Administration looking to consolidate its air traffic control facilities in the region, officials from across Suffolk gathered at Long Island MacArthur Airport (LIMA) on Thursday to encourage the FAA to house its new center at the airport in Ronkonkoma.¶ The FAA is looking to bring its air traffic control operations, currently located in Ronkonoma and Westbury, under one roof.¶ In addition to Long Island, published reports have indicated the FAA is also looking at locations in Poughkeepsie and Albany.¶ During a press conference at the airport, Islip Town Supervisor Tom Croci said locating the NextGen air traffic control facility at MacArthur would keep current high-paying air traffic control jobs in the County, and also create new construction jobs in the region.¶ “The FAA is already a member of our community,” Croci said. “Their employees live and shop in our Town; their children go to our schools. The airport is a natural fit for the future of the FAA.”¶ Although no economic impact study has been done to calculate the effect of losing the 524 positions at the current Ronkonkoma air traffic control facility, Croci said those jobs leaving Long Island would be devastating.¶ “It would have a tremendous impact on the local economy,” he said. “But on the opposite side having the new facility here would add another 500 high-paying jobs, and that would be a real spark locally.”¶ In addition to bringing more air traffic control jobs to Suffolk, officials also noted construction of the new facility would create more than 1,000 construction jobs, and also present a new opportunity for Long Island’s aerospace and technology firms to expand and grow.¶ While job preservation and creation was a main theme touched on by nearly all of the town, county and state officials who spoke during the press conference, Islip’s supervisor further noted MacArthur Airport currently surpasses FAA site requirements for a new air traffic control facility.¶ Islip Town officials said the airport’s location is within the 150-mile radius FAA requirement for the new facility, and MacArthur also meets the need to have access to power and fiber optic lines.¶ Furthermore, the location of the new structure must also meet FAA acreage requirements, which the airport surpasses since more than 80 acres are available.¶ Croci said the FAA is expected to make a decision on where to place the consolidated air traffic control facility within the year.

### Economy Exts - US econ key to world econ

#### US economic crisis collapses global economy

Rahman 2011 [Ashfaqur - former Ambassador and Chairman of the Center for Foreign Affairs Studies, "Another global recession?", August 21,

http://www.thedailystar.net/newDesign/news-details.php?nid=199461] ttate

Several developments, especially in Europe and the US, fan this fear. First, the US recovery from the last recession has been fragile. Its economy is much more susceptible to geopolitical shocks. Second there is a rise in fuel prices. The political instability in the Middle East is far from over. This is causing risks for the country and the international economy. Third, the global food prices in July this year is markedly higher than a year ago, almost 35% more. Commodities such as maize (up 84%), sugar (up 62%), wheat (up 55%), soybean oil (up 47%) have seen spike in their prices. Crude oil prices have also risen by 45%, affecting production costs. In the US, even though its debt ceiling has been raised and the country can now continue to borrow, credit agencies have downgraded its credit rating and therefore its stock markets have started to flounder. World Bank President Zoellick recently said: "There was a convergence of some events in Europe and the US that has led many market participants to lose confidence in economic leadership of the key countries." He added: "Those events, combined with other fragilities in the nature of recovery, have pushed US into a new danger zone." Employment in the US has, therefore, come near to a grinding halt. Prices of homes there continue to slide. Consumer and business spending is slowing remarkably. So, when the giant consumer economy slows down, there would be less demand for goods she buys from abroad, even from countries like Bangladesh. This would lead to decline in exports from such countries to the US. Then these economies would start to slide too, leading to factory closures and unemployment on a large scale. There would be less money available for economic development activities. Adding to the woes of the US economy are the travails of European economies. There, countries like Greece and Portugal, which are heavily indebted, have already received a first round of bailout. But this is not working. A second bailout has been given to Greece. But these countries remain in deep economic trouble. Bigger economies like Spain and Italy are also on the verge of bankruptcy. More sound economies like France and Germany are unwilling to provide money through the European Central Bank to bail them out. A proposal to issue Euro bonds to be funded by all the countries of the Euro Zone has also not met with approval. A creeping fear of the leaders of such big economies is that their electorate is not likely to agree to fund bankruptcies in other countries through the taxes they pay. Inevitably, they are saying that these weaker economies must restrain expenditures and thereby check indebtedness and live within their means. Thus, with fresh international bailouts not in the horizon and with possibilities of a debt default by countries like Greece, there is a likelihood of a ripple going through the world's financial system. Now what is recession and especially one with a global dimension ? There is no commonly accepted definition of a recession or for that matter of a global recession. The International Monetary Fund (IMF) regards periods when global growth is less than 3% to be a global recession. During this period, global per capita output growth is zero or negative and unemployment and bankruptcies are on the rise. Recession within a country implies that there is a business cycle contraction. It occurs when "there is a widespread drop in spending following an adverse supply shock or the bursting of an economic bubble." The most common indicator is "two down quarters of GDP." That is, when GDP of a country does not increase for six months. When recession occurs there is a slowdown in economic activity. Overall consumption, investment, government spending and net exports fall. Economic drivers such as employment, household savings, corporate investments, interest rates are on the wane. Interestingly, recession can be of several types. Each type may be literally of distinctive shapes. Thus V-shaped, or a short and sharp contraction, is common. It is usually followed by a rapid and sustained recovery. A U-shaped slump is a prolonged recession. The W-shaped slowdown of the economy is a double dip recession. There is also an L-shaped recession when, in 8 out of 9 three-monthly quarters, the economy is spiraling downward. So what type of recession can the world expect in the next quarter? Experts say that it could be a W-shaped one, known as a double dip type. But let us try to understand why the world is likely to face another recession, when it has just emerged from the last one, the Great Recession in 2010. Do not forget that this recession had begun in 2007 with the "mortgage and the derivative" scandal when the real estate and property bubble burst. Today, many say that the last recession had never ended. Despite official data that shows recovery, it was only a modest recovery. So, when the recession hit the US in 2007 it was the Great Recession I. The US government fought it by stimulating their economy with large bailouts. But this time, for the Great Recession II, which we may be entering, there is a completely different response. Politicians are squabbling over how much to cut spending. Therefore, we may be in a new double dip or W-shaped recession.

### Economy Adv Exts - Impacts

#### Collapse of the U.S. economy breeds multi-polarity; causes great power wars

Khalilzad 11(Zalmay, the United States ambassador to Afghanistan, Iraq, and the United Nations during the presidency of George W. Bush and the director of policy planning at the Defense Department from 1990 to 1992, “The Economy and National Security”, 02/11/11, 07/12/12, <http://www.nationalreview.com/blogs/print/259024> | Kushal)

Today, economic and fiscal trends pose the most severe long-term threat to the United States’ position as global leader. While the United States suffers from fiscal imbalances and low economic growth, the economies of rival powers are developing rapidly. The continuation of these two trends could lead to a shift from American primacy toward a multi-polar global system, leading in turn to increased geopolitical rivalry and even war among the great powers. The current recession is the result of a deep financial crisis, not a mere fluctuation in the business cycle. Recovery is likely to be protracted. The crisis was preceded by the buildup over two decades of enormous amounts of debt throughout the U.S. economy — ultimately totaling almost 350 percent of GDP — and the development of credit-fueled asset bubbles, particularly in the housing sector. When the bubbles burst, huge amounts of wealth were destroyed, and unemployment rose to over 10 percent. The decline of tax revenues and massive countercyclical spending put the U.S. government on an unsustainable fiscal path. Publicly held national debt rose from 38 to over 60 percent of GDP in three years. Without faster economic growth and actions to reduce deficits, publicly held national debt is projected to reach dangerous proportions. If interest rates were to rise significantly, annual interest payments — which already are larger than the defense budget — would crowd out other spending or require substantial tax increases that would undercut economic growth. Even worse, if unanticipated events trigger what economists call a “sudden stop” in credit markets for U.S. debt, the United States would be unable to roll over its outstanding obligations, precipitating a sovereign-debt crisis that would almost certainly compel a radical retrenchment of the United States internationally. Such scenarios would reshape the international order. It was the economic devastation of Britain and France during World War II, as well as the rise of other powers, that led both countries to relinquish their empires. In the late 1960s, British leaders concluded that they lacked the economic capacity to maintain a presence “east of Suez.” Soviet economic weakness, which crystallized under Gorbachev, contributed to their decisions to withdraw from Afghanistan, abandon Communist regimes in Eastern Europe, and allow the Soviet Union to fragment. If the U.S. debt problem goes critical, the United States would be compelled to retrench, reducing its military spending and shedding international commitments. We face this domestic challenge while other major powers are experiencing rapid economic growth. Even though countries such as China, India, and Brazil have profound political, social, demographic, and economic problems, their economies are growing faster than ours, and this could alter the global distribution of power. These trends could in the long term produce a multi-polar world. If U.S. policymakers fail to act and other powers continue to grow, it is not a question of whether but when a new international order will emerge. The closing of the gap between the United States and its rivals could intensify geopolitical competition among major powers, increase incentives for local powers to play major powers against one another, and undercut our will to preclude or respond to international crises because of the higher risk of escalation. The stakes are high. In modern history, the longest period of peace among the great powers has been the era of U.S. leadership. By contrast, multi-polar systems have been unstable, with their competitive dynamics resulting in frequent crises and major wars among the great powers. Failures of multi-polar international systems produced both world wars. American retrenchment could have devastating consequences. Without an American security blanket, regional powers could rearm in an attempt to balance against emerging threats. Under this scenario, there would be a heightened possibility of arms races, miscalculation, or other crises spiraling into all-out conflict. Alternatively, in seeking to accommodate the stronger powers, weaker powers may shift their geopolitical posture away from the United States. Either way, hostile states would be emboldened to make aggressive moves in their regions.

#### Economic decline leads to nuclear war

Mead 2009 [Walter - CFR senior fellow, "Only makes you stronger", February 04, http://www.tnr.com/article/only-makes-you-stronger-0] ttate

If financial crises have been a normal part of life during the 300-year rise of the liberal capitalist system under the Anglophone powers, so has war. The wars of the League of Augsburg and the Spanish Succession; the Seven Years War; the American Revolution; the Napoleonic Wars; the two World Wars; the cold war: The list of wars is almost as long as the list of financial crises. Bad economic times can breed wars. Europe was a pretty peaceful place in 1928, but the Depression poisoned German public opinion and helped bring Adolf Hitler to power. If the current crisis turns into a depression, what rough beasts might start slouching toward Moscow, Karachi, Beijing, or New Delhi to be born? The United States may not, yet, decline, but, if we can't get the world economy back on track, we may still have to fight.

#### Economic growth key to US primacy - solves global war

Khalilzad 2011 [Zalmay - former US ambassador to Iraq, "The economy and national security", February 08, *National Review,* http://www.nationalreview.com/articles/259024/economy-and-national-security-zalmay-khalilzad] ttate

Today, economic and fiscal trends pose the most severe long-term threat to the United States’ position as global leader. While the United States suffers from fiscal imbalances and low economic growth, the economies of rival powers are developing rapidly. The continuation of these two trends could lead to a shift from American primacy toward a multi-polar global system, leading in turn to increased geopolitical rivalry and even war among the great powers. The current recession is the result of a deep financial crisis, not a mere fluctuation in the business cycle. Recovery is likely to be protracted. The crisis was preceded by the buildup over two decades of enormous amounts of debt throughout the U.S. economy — ultimately totaling almost 350 percent of GDP — and the development of credit-fueled asset bubbles, particularly in the housing sector. When the bubbles burst, huge amounts of wealth were destroyed, and unemployment rose to over 10 percent. The decline of tax revenues and massive countercyclical spending put the U.S. government on an unsustainable fiscal path. Publicly held national debt rose from 38 to over 60 percent of GDP in three years. Without faster economic growth and actions to reduce deficits, publicly held national debt is projected to reach dangerous proportions. If interest rates were to rise significantly, annual interest payments — which already are larger than the defense budget — would crowd out other spending or require substantial tax increases that would undercut economic growth. Even worse, if unanticipated events trigger what economists call a “sudden stop” in credit markets for U.S. debt, the United States would be unable to roll over its outstanding obligations, precipitating a sovereign-debt crisis that would almost certainly compel a radical retrenchment of the United States internationally. Such scenarios would reshape the international order. It was the economic devastation of Britain and France during World War II, as well as the rise of other powers, that led both countries to relinquish their empires. In the late 1960s, British leaders concluded that they lacked the economic capacity to maintain a presence “east of Suez.” Soviet economic weakness, which crystallized under Gorbachev, contributed to their decisions to withdraw from Afghanistan, abandon Communist regimes in Eastern Europe, and allow the Soviet Union to fragment. If the U.S. debt problem goes critical, the United States would be compelled to retrench, reducing its military spending and shedding international commitments.We face this domestic challenge while other major powers are experiencing rapid economic growth. Even though countries such as China, India, and Brazil have profound political, social, demographic, and economic problems, their economies are growing faster than ours, and this could alter the global distribution of power. These trends could in the long term produce a multi-polar world. If U.S. policymakers fail to act and other powers continue to grow, it is not a question of whether but when a new international order will emerge. The closing of the gap between the United States and its rivals could intensify geopolitical competition among major powers, increase incentives for local powers to play major powers against one another, and undercut our will to preclude or respond to international crises because of the higher risk of escalation. The stakes are high. In modern history, the longest period of peace among the great powers has been the era of U.S. leadership. By contrast, multi-polar systems have been unstable, with their competitive dynamics resulting in frequent crises and major wars among the great powers. Failures of multi-polar international systems produced both world wars.

### Environment Extensions - Congestion causes emissions

#### Congestion is a key contributor to airline emissions - NextGen decreases fuel use

Schank 12(Joshua, President & CEO Eno Center for Transportation, “Next Generation Air Traffic Control: Looking at the Big Picture”, 07/06/12, AD: 07/10/12, <http://www.enotrans.org/eno-brief/next-generation-air-traffic-control-looking-at-the-big-picture> | Kushal)

The upgrading of our nation’s air traffic control (ATC) system – often referred to as NextGen – is a great example of how technology and policy can be thoroughly intertwined. A technology upgrade would seem to be relatively straightforward, but it turns out to be incredibly complicated, especially when policy is involved. The obvious policy problems are who is going to pay and who is going to benefit. NextGen is further complicated by the various public and private sector roles and the fact that almost all parties need to make substantial investments and don’t want to be left out in the cold by going first and finding that others (particularly the FAA) do not follow. There is also concern on the part of some stakeholders that they could wind up paying for a disproportionate share of the costs relative to the benefits they could potentially accrue. Eno is releasing a paper Wednesday, April 4, on NextGen, and convening a larger working group later this year to address some of these issues.¶ One issue that frequently occurs when technology and policy collide, but is often overlooked, is the tendency to assume benefits based on the capabilities of the technology rather than the likely real world impacts of the policy on business practices. This is likely to happen because we look at the issue as a technology upgrade, and therefore assume the benefits on that basis. But technology is merely one component of the changes to be brought by NextGen, or any similar upgrade to a transportation network, and it is the policy that in the end determines the extent of the benefits from that upgrade.¶ NextGen will only be as powerful and effective as the accompanying policies that go along with it. This article examines some of the potential benefits of NextGen and how they might be affected by policy changes or a lack thereof.¶ Airport Congestion¶ The prolonged economic downturn has put this issue on the backburner temporarily, but it will be back with a vengeance when the economy begins to grow quickly. While most airport delays are related to weather, many are also due to the fact that often the number of aircraft seeking to takeoff or land at a given airport at a given time can exceed the capacity at an airport. If bad weather hits at one of these times, and at a crucial hub airport such as Chicago O’Hare or Atlanta Hartsfield, the entire system can be crippled very quickly. In theory, NextGen should help alleviate some of this congestion. Improved ATC technology can increase the effective capacity of the aviation system by reducing separations between aircraft allowing a greater number of planes to land safely in the same period of time.¶ However, the extent to which such improvements actually reduce congestion will depend in large part on policy. Congestion is a tricky thing – providing more capacity does not necessarily reduce delay if there is latent demand. If aircraft operators choose to take advantage of the new capacity by flying more frequent flights – and airlines in particular are prone to do this because frequency and market share are directly related – some of these congestion savings could be negated.¶ We have no comprehensive national policy in place to effectively reduce airport congestion, and many congested airports have struggled in their attempts to add runways or smooth out demand. One way that we could potentially improve the policy and take advantage of the NextGen benefits would be to provide federal incentives for airports that price their runways in an innovative way that reduces delay. Even better would be if the federal government provided funding for multimodal intercity planning that could coordinate across all intercity modes to deliver greater throughput for passengers into congested regions. There may be other ideas out there as well, and it is essential we begin considering them now, not after NextGen is a reality, so that we can tailor NextGen appropriately to support various policy scenarios.¶ Safety¶ We already enjoy the benefits of an incredibly safe air transportation system. Nonetheless, NextGen may still provide some improvements, particularly with respect to General Aviation (GA) aircraft. Giving pilots a better understanding of where they are in the airspace with respect to other aircraft has clear value for reducing total casualties.¶ However, these safety improvements will only matter insofar as they are accompanied by effective training and workforce development. According to the National Transportation Safety Board, pilot error, not ATC technology, is the cause of most aircraft accidents. With accident rates at such a low level, improvements in ATC are going to have a negligible impact unless they are accompanied by appropriate training that enables pilots and controllers to maximize the benefits of the technology.¶ The workforce development problem is even more serious. We face serious challenges in bringing new talent to the aviation industry for several reasons. One is the decline in pay – as pilot salaries and benefits have been cut there is less glamour and financial reward associated with the profession. New airline pilots in particular face low salaries along with a lifestyle that keeps them away from home for long periods of time. A second problem is that the military was once a pipeline for developing and training pilots, but the increased use of drones may be cutting into that substantially. As drones become more prevalent this problem may increase.¶ Without a policy to combat this workforce development problem, we may find ourselves with a less qualified crop of pilots and air traffic controllers, which could ultimately impact safety. Or we may simply face a shortage, which will substantially increase costs for the industry. Either way, the implementation of NextGen should be accompanied by a plan for improving workforce development. This may take the form of a specific policy initiative, or it may not, but it is imperative to consider it when thinking about NextGen.¶ Fuel Savings and Environmental Benefits¶ Most of the projected fuel savings and environmental benefits from NextGen would be as a result of congestion reduction, already discussed above. Reduced congestion could leave fewer planes burning fuel on the tarmac or circling airports. But some fuel savings would occur independent of what happens with congestion, because NextGen is likely to make aircraft approaches more efficient. Aircraft currently use a “stepped” descent whereby they descend quickly and then maintain altitude several times. This uses more engine power than a constant descent, which would be possible to do safely under NextGen.¶ While these benefits are certainly real and valuable, they do not confront the ultimate policy problem, which is that the aviation system, and practically speaking the entire transportation system, is almost entirely dependent on oil. This has economic, environmental, and national security implications. The economic ones hit the airline industry hard – when fuel prices go up their thin profit margins can vanish in an instant. The environmental impacts are more acute in the automobile sector, where cars and trucks are responsible for as much of a third of annual greenhouse gas emissions. The national security implications, contrary to popular belief, do not go away simply because we are producing more oil domestically. We are still dependent on oil, and oil is priced as a global commodity, so we still put ourselves at risk by being dependent on a global resource of which a substantial amount is in the hands of hostile nations.¶ To get beyond the direct savings and into this core issue, we need to think well beyond moving aircraft or automobiles more efficiently. We need to move aggressively on alternatives to oil-dependent transportation, and it is not likely to happen by throwing more research money at the problem. The federal government needs to begin providing real incentives for innovations that demonstrate results in this area, and this does not mean simply providing tax breaks for Chevy Volts or Boeing 787s. Instead it means providing grants to states and regions than can demonstrate proposed investments and policy actions that will result in real reductions in fuel consumption through specific actions.¶ For example, in the Northeast and in California this might mean shifting passengers from shuttle flights and passenger cars to trains and buses. In the Pacific Northwest it could involve setting up electric vehicle charging stations at major airports. At major airport hubs it could mean pricing landing fees based in part on aircraft efficiency. These innovations and others can harness the initial benefits from NextGen and increase them by an order of magnitude.¶ Conclusions¶ Americans love technological fixes. We are great innovators and see technology as a way to constantly improve our lives and reduce inefficiencies. But sometimes technology is only as good as the policy that accompanies it. NextGen is a perfect example of this. It has the potential to be a revolutionary new technology, but it is not as if one day we flip a switch, and NextGen is on, and we start saving billions of dollars. More realistically, we will be slowly progressing towards NextGen for decades. We should take this opportunity to make improvements to policy that will maximize its eventual impact.

### Environment Exts - Aviation Industry key

#### Aviation is key to our carbon footprint - any statistics that show low percentages are misleading and do not take multipliers into account

Clark 10 (Duncan Clark is a consultant editor on the Guardian environment desk. He has written and edited a number of books on environmental and technology topics as well as working at BBC Worldwide and 10:10. “Aviation Q&A: the impact of flying on the environment” http://www.guardian.co.uk/environment/2010/apr/06/aviation-q-and-a April 6, 2010) FOSTER

Does air travel really have a big environmental footprint? There's no way around the fact that flights are bad news for the environment. It's not just that planes are worse than most other forms of transport in terms of the impact of greenhouse gases per passenger mile. Just as important is the simple fact that flying allows us to travel a far greater number of miles than we otherwise could. Thanks to these two factors, individual trips by air can have a remarkably large carbon footprint – which helps explain why aviation has become such a heated issue in the climate change debate. What is the total impact of flying on the climate? As the aviation industry is usually keen to point out, planes account for only around 1.5%–2% of global CO2 emissions. However, this figure is somewhat misleading. For one thing, most flights are taken by the wealthy, so in developed countries the slice of CO2 emissions caused by flying is higher – around 6.3% in the UK, according to Department for Transport figures for 2005. Even this figure underplays aviation's environmental footprint, however, and not just because the number of flights has risen since 2005. There are at least three other reasons why 6.3% is likely to be a strong underestimate. First, the total global warming impact of each flight is thought to be around twice as high as the CO2 emissions alone (see 'What's an aviation multiplier?', below). Second, the figures are skewed in favour of British travellers. The standard way to account for the emissions for an international flight is to allocate half to the country of departure and half to the country of arrival. But UK residents take up two-thirds of the seats on the average plane landing at or taking off from a British airport. This means the official statistics are effectively offloading the emissions of British holidaymakers and businesspeople on to the countries they're visiting. Third, the aviation industry causes emissions over and above those of the planes themselves. The processing and transportation of the aviation fuel, and the manufacture and maintenance of planes, airports and support vehicles all create extra carbon dioxide. There's not enough data to say for sure, but it seems likely that aviation's true impact in the UK is around 13%–15% of total greenhouse gas emissions. If that still sounds fairly low, compared with the massive amounts of attention heaped on aviation by climate change campaigners, bear in mind that most people in the UK don't regularly fly. The average British resident takes a short-haul leisure flight only every two years, and a long-haul leisure flight only every five years. In other words, the air travel of a minority of regular flyers causes a substantial slice of UK emissions. Is the UK government's aviation policy compatible with its carbon targets? It's very hard to reconcile the British government's plans for increased aviation capacity with its plans for carbon cuts. The UK is seeking to reduce its emissions by 80% by 2050, relative to 1990 levels. At the same time it predicts a rise in the number of flights sufficient to use up more than half of the remaining 20% of emissions. What about greener planes? A number of technologies designed to reduce the environmental impact of flying have been researched, tested and implemented. However, compared with greener cars, where the technologies are proved and the carbon saving huge, the potential for eco-friendly flying looks rather limited. There will be some further gains in engine efficiency over the coming decades, and larger planes with more seats will allow slightly lower emissions per passenger. But there is nothing in the pipeline with the transformative potential of the electric car. The problem is that electric motors can't produce enough power to get a plane off the ground, so the only alternative to regular kerosene-based aviation fuels are special kinds of biofuels. These aren't an ideal solution, since biofuels can be environmentally problematic in themselves, and anyhow it would take a huge chunk of the world's arable land to grow enough crops to fuel all the world's planes. (A back-of-the-envelope calculation suggests it might require as much as a fifth of all cropland.) What can individuals do? For anyone concerned about their contribution to global warming, cutting back on air travel is an obvious goal. This might mean giving up flying altogether or it might mean taking fewer flights and picking destinations that are closer to home. It's true that short flights tend to be more harmful to the climate per mile travelled than long-haul flights are (because they have more empty seats, and because taking off and landing burns more fuel than cruising) but this doesn't change the fact that the further you travel, the greater the emissions that will result. If you do fly, you can in theory make some small difference to the carbon impact by favouring day-time flights. This at least means that any contrails (see 'What's an aviation multiplier?' below) caused by the plane will reflect some sunlight away from the Earth in addition to locking warmth into the atmosphere. Also consider limiting your luggage. Finally, you might want to consider which airlines you use. People often assume that budget flights are somehow more eco-unfriendly than expensive ones. In fact, the opposite tends to be true. Budget airlines pack more passengers on each flight and typically have younger, more fuel-efficient fleets than longer-established airlines. Indeed, the least eco-friendly tickets of all aren't the cheapest but the most expensive. Business-class and first-class seats take up more space on the plane, thereby reducing the number of people who can fit on each flight. Is it really greener to go by train? As a rule, taking the train instead of the plane will substantially reduce your carbon emissions – perhaps by a factor of five to ten on a domestic trip. The benefits will be somewhat reduced as the journey gets longer. That's partly because shorter flights are more polluting per passenger mile than longer ones, but it's also because long train journeys usually necessitate sleeping onboard. Sleeper cars usually carry fewer passengers than regular carriages, so their emissions per passenger are higher. If, as is common in some countries, the train is powered by diesel rather than electricity, then the emissions will typically be higher still. Indeed, an old diesel sleeper train travelling a long distance might emit nearly as much CO2₂per passenger as a plane. Even then, the train will typically be greener once you consider the plane's non-CO2 warming effects, but the fact remains that long-haul rail is not by any means inherently eco-friendly. Unfortunately, almost every long-distance train journey will cost you far more than flying would. Indeed, the difference in price is often so great that for some unavoidable trips it would arguably make sense to take the plane and spend the savings on something more environmentally beneficial than a train ticket, such as insulation at home. What's an 'aviation multiplier'? The impact of planes on the climate is complicated and not perfectly understood. The CO2 emissions are straightforward enough, but plane engines also generate a host of other "outputs", including nitrous oxide, water vapour and soot. At flying altitudes in the upper troposphere and lower stratosphere, these outputs produce a range of climatic effects, multiplying the plane's environmental impact. For example, nitrous oxide causes the formation of ozone — a greenhouse gas that warms the local climate — but at the same time undergoes reactions which destroy methane, thereby removing another greenhouse gas from the atmosphere. Even more complicated is the impact of soot and water vapour, which together can cause contrails (vapour trails) and in cold air can lead to the formation of cirrus clouds. The science surrounding this topic is not yet rock solid, but researchers believe that contrails add to the greenhouse effect – especially at night, when their tendency to stop heat escaping from the Earth isn't offset by their tendency to reflect incoming sunlight. Today, most experts favour an aviation "multiplier" of around two. In other words, they believe that the total impact of a plane is approximately twice as high as its CO2 emissions. The exact multiplier, however, will always depend on the individual plane, the local climate and the time of day.

#### Aviation has a multiplier effect on the world's carbon footprint - it emits CO2 from jet emissions but also emits water vapor, which creates heat-trapping clouds

Fleming 9 (Aviation and Climate Change: Aircraft Emissions Expected to Grow, but Technological and Operational Improvements and Government Policies Can Help Control Emissions June 8, 2009 Statement of Susan Fleming, Director, Physical Infrastructure Issues. June 8, 2009 This is a GAO report. LexisNexis.) FOSTER

Emissions from a variety of human-generated sources, including commercial aircraft, trap heat in the atmosphere and contribute to climate change. During flight operations, aircraft emit a number of greenhouse gas and other emissions, including carbon dioxide, nitrogen oxides (NOx), soot, and water vapor. Figure 1 shows the primary emissions from commercial aircraft. Carbon dioxide emissions from aircraft are a direct result of fuel burn. For every gallon of jet fuel burned, about 21 pounds of carbon dioxide are emitted. Reducing the amount of fuel burned, therefore, also reduces the amount of carbon dioxide emitted. Water vapor emissions and certain atmospheric temperature and humidity conditions can lead to the formation of contrails, a cloudlike trail of condensed water vapor, and can induce the creation of cirrus clouds. Both contrails and cirrus clouds are believed to have a warming effect on the earth's atmosphere. Aircraft also emit other pollutants that affect local air quality. Finally, airport operations are sources of greenhouse gas and other emissions, which we are not examining in this report.

#### Emissions from aviation key to global environmental problems - it will only get exponentially worse in the status quo as aviation industry continues to increase their emissions while other sectors decrease their emissions

Waitz et al 4 (Ian - professor and director of Partnership for AiR Transportation Noise and Emissions Reduction @ Massachusetts Institute of Technology, "Report to the United States Congress: Aviation and the Environment", December 2004 [http://web.mit.edu/aeroastro/partner/reports/congrept\_aviation\_envirn.pdf pg.3](http://web.mit.edu/aeroastro/partner/reports/congrept_aviation_envirn.pdf%20pg.3)) Foster

Aviation is a critical part of our national economy, providing for the movement of people and goods throughout the world, enabling our economic growth. In the last 35 years there has been a six-fold increase in the mobility provided by the U.S. air transportation system. At the same time there has been a 60% improvement in aircraft fuel efficiency and a 95% reduction in the number of people impacted by aircraft noise. Despite this progress, and despite aviation’s relatively small environmental impact in the United States, there is a compelling and urgent need to address the environmental effects of air transportation. Because of strong growth in demand, emissions of some pollutants from aviation are increasing against a background of emissions reductions from many other sources. In addition, progress on noise reduction has slowed. Millions of people are adversely affected by these side effects of aviation. As a result of these factors and the rising value being placed on environmental quality, there are increasing constraints on the mobility, economic vitality and security of the nation. Airport expansion plans have been delayed or canceled due to concerns over local air quality, water quality and community noise impacts. Military readiness is challenged by restrictions on operations. These effects are anticipated to grow as the economy and demand for air transportation grow. If not addressed, environmental impacts may well be the fundamental constraint on air transportation growth in the 21st century. The concerns extend well beyond American shores. For example, within the European Union (EU) the climate impacts of aviation are identified as the most significant adverse impact of aviation, in contrast to the United States and many other nations where air quality and noise are the current focus of attention. As a result, there are increasing EU calls for regulation—trading, taxes and charges, demand management and reduced reliance on aviation—even though there is large uncertainty in the understanding of the climate effects of aircraft and appropriate means to mitigate these effects. Despite the importance of this issue, the United States does not have a significant research program to assess the potential impacts of aviation on climate. This may put the United States at a disadvantage in evaluating technological, operational and policy options, and in negotiating appropriate regulations and standards with other nations. The international concerns will continue to grow with the strong increase in air transportation demand anticipated for Asia. Immediate, focused action is required to address the interdependent challenges of aviation noise, local air quality and climate impacts. Not acting, as stated above,

will not only affect millions of Americans living near airports but will adversely impact the vitality and security of our nation. A national vision and strategic plan of action are required.

#### Aviation industry large contributor to global greenhouse gas emissions - that will only increase as flights increase

Sgouridis et al 11(Sgouris, Associate Professor at the Masdar Institute of Science and Technology; PHILIPPE A. BONNEFOY, Postdoctoral Associate in the Department of Aeronautics & Astronautics at MIT; Dr. R. John Hansman, Professor in the Department of Aeronautics and Astronautics at MIT, where he is Head of the Humans and Automation Division, Director of the International Center for Air Transportation. Transportation Research Part A: Policy & Practice; Dec2011, Vol. 45 Issue 10, p1077-1091.) cass

Historically, air transportation activity has exhibited significant growth (Fig. 1). North America and Europe have grown at an¶ average annual rate of 5.7% and 5.0% respectively over the last 20 years. Asia-Pacific has exhibited significant growth (i.e. 8.8%)¶ and is now reaching traffic levels comparable to Europe. Impressive growth has also been observed in the Middle East with 13%¶ annual growth between 2000 and 2007. Schafer and Victor (2000) affirm expectations that the impetus for these growth rates¶ for aviation will be maintained using a time-budget model to project growth rates across transportation sectors.¶ However, air transportation activity is also a contributor to greenhouse gas emissions (e.g. CO2, NOx) and future growth of¶ this industry sector is likely to be accompanied with increasing emissions unless significant efficiency improvements and¶ mitigating measures are implemented. The Intergovernmental Panel for Climate Change (IPCC) evaluated the effects of¶ the transportation sector on climate change using scenarios to forecast the demand and emissions of the different modes¶ (IPCC, 1999; Ribeiro et al., 2007). These forecasts were building on work from the United States Energy Information Administration¶ (EIA, 2005), the International Energy Agency (IEA, 2004) and the World Business Council on Sustainable Development¶ (WBCSD, 2004).¶ As shown in Fig. 2, CO2 emissions from air transportation are expected to increase significantly in nominal terms. While¶ the relative contribution of the aviation sector to the global anthropogenic carbon emissions is currently estimated at about¶ 3%, the higher potential for improvements and emission reductions from other sectors are likely to contribute to an increase in the aviation’s relative contribution. The 1999 IPCC report suggests that this contribution may rise to 5% and could reach up¶ to 15% by 2050 (IPCC, 1999).¶ The GHG emissions generated by aviation are not limited to CO2. The IPCC (1999) and Sausen et al. (2005) estimate the relative contribution of CO2 to total green house gas (GHG) effects to be approximately 53%. Lee et al. (2009) present the¶ most recent information on the relative contribution of other GHG gases from the aviation sector and estimate the total radiative¶ forcing from aviation to be 3.5% of total anthropogenic forcing excluding the effect of clouds. The net effect of NOx emissions¶ that increase ozone (i.e. O3) concentrations and decrease methane (i.e. CH4) is estimated at 24%. The effect of contrails is estimated at 21% and the remaining combined effect of H2O, SOx and soot contributes to 2.1% of the total effects.3 These annual impacts of emissions do not address the different life cycles of the gases. Marais et al. (2008) indicate that the long-term effect of carbon emissions, which also happen to have the longest atmospheric life exceeding 100 years, may dominate the effect of other greenhouse gases depending on the evaluation method used and the discount rate. Because of its high relative contribution¶ to GHG effects, its long lasting impacts and the high uncertainty surrounding non-carbon radiative forcing, this paper¶ will solely focus on the CO2 emissions from aviation.

### Environment Exts - Airline Carbon Footprint will increase

#### Negative's arguments are underreported - the most authoritative experts in the field claim the airline's industry emissions are increasing much more than we thought

Demerjian 8 (Dave, a writer for wired.com reporting on a report release by the Dept. of Transportation, Eurocontrol, and Manchester Metropolitan University. http://www.wired.com/autopia/2008/05/airline-emissio/ May 7, 2008) FOSTER

Forget everything you’ve heard about airlines and CO2 emissions. The news is much worse than anyone thought. A recently disclosed report finds that airlines are spewing 20 percent more carbon dioxide into the environment than previously estimated and the amount could hit 1.5 billion tons a year by 2025. That’s far more than even the worst-case predictions laid out by the International Panel on Climate Change. If you’re looking to put that number in perspective, the European Union currently emits 3.1 billion tons of CO2 annually. Yup, that’s the entire 27-nation, 457 million person EU. The report, "Trends in Global Aviation Noise and Emissions from Commercial Aviation for 2000 to 2025," is among the most authoritative estimates of the industry’s growth in emissions. It was produced by the U.S. Department of Transportation, Eurocontrol, the Manchester Metropolitan University and the technology company QinetiQ. They used a variety of models to calculate current fuel use, then projected out to 2025 based on these findings and anticipated increases in air travel. "Growth of CO2 emissions on this scale will comfortably outstrip any gains made by improved technology and ensure aviation is an even larger contributor to global warming by 2025 than previously thought," Jeff Gazzard, a spokesman for the Aviation Environment Federation, the group that uncovered the report, told the Independent. "Governments must take action to put a cap on air transport’s unrestrained growth." The report was written for an aviation conference in Barcelona last year, but was turned down by organizers. It remained out of sight until the Aviation Environment Federation unearthed it and announced somewhat dramatically that the report had been "suppressed." Suppressed or not, it has provided fresh ammunition for environmental groups trying to pressure governments into restraining commercial aviation growth. The response of the airline industry, which is exempt from the Kyoto Protocol for reducing greenhouse gases, isn’t surprising. The International Air Transport Association, a trade group representing 240 airlines, says it is working as hard as possible to produce binding emission-reduction targets and argues skyrocketing fuel prices are pushing airlines to find alternatives to fossil fuels.

#### Even if the Negative wins that the status quo airline carbon footprint is small, the percentage will exponentially increase with an increase of travelers, which causes more flights and delays

Walsh 9. (Brian, writer for Time Specials, “Getting Air Traffic Under Control”, Time Specials, 10/07/01, [http://www.time.com/time/specials/packages/article/0,28804,1929071\_1929070\_1929069,00.html](http://www.time.com/time/specials/packages/article/0%2C28804%2C1929071_1929070_1929069%2C00.html), 07/11/12, Chin)

It's bad enough that an archaic air-traffic-control system has led to pitiful performance: nearly 25% of U.S. flights were late in 2008. But inefficiencies in the air and on the ground caused by the system also mean fuel wasted and carbon dioxide emitted at the very time when the air-travel industry is coming under scrutiny for its role in climate change. Though airlines contribute only about 2% of global carbon emissions, that figure is set to rise as air travel expands, especially in the developing world. And for frequent travelers, flights can enlarge their personal carbon footprint — a round-trip journey between New York City and London emits 1.5 metric tons of CO2 per passenger. "We're 2%, but we are a very visible 2%," says Paul Steele, who directs environmental initiatives for the International Air Transport Association (IATA).

### Environment Exts - Next Gen solves fuel emissions

#### Next Gen will be able to reduce fuel emissions - large contributor to global footprint

Brian Wilson 10, avionics engineer,http://www.avbuyer.com/articles/PrintDetail.asp?Id=1753, “PLANE SENSE ON COCKPITS – NEXTGEN”,9/10/ jeong

The two delegations will coordinate their technical efforts and research and development resources in support of their goal to have a global standardization of the Air Traffic Management (ATM) systems. The inter-operability of the two ATM systems is in fact essential to airspace users - airlines and private aircraft in particular - as it will enable aircraft to fly in US and EU airspaces with the same equipment to navigate, communicate and report essential flight information.¶ The United States and the European Union share the same concern; air traffic is forecast to double by 2030 and the existing infrastructure and ground-based technology is outdated, and has not been overhauled since the 1970s. The technical gaps between this legacy equipment and new technologies have reached a point where they are impossible to bridge. The NextGen-SESAR cooperation has been launched to investigate and develop operational and technical solutions.¶ One example of these operational trials started in June 2009 and is currently operating under the Atlantic Interoperability Initiative to Reduce Emissions (A.I.R.E. initiative), a program designed to explore ways to reduce Aviation’s carbon footprint. Participating in the daily trails are numerous American and European airlines.¶ Flights over the Atlantic are monitored by a modernized operations center in New York which receives new trajectory clearance requests from the crew who want to take advantage of favorable winds or routing to save time and fuel consumption. The request is sent from the cockpit Flight Management System (FMS) via a modified data link called Controller Pilot Data Link Communications (CPDLC). Usually within a minute, the Air Traffic Controller in New York reviews the request and sends the corresponding approval back to the crew which then programs the new route into the FMS.¶ The second component of the initiative is the issuance of Tailored Arrival Clearances into Miami known as Optimum Profile Descents, which allow the aircraft to “glide” on idle thrust from the Top of Descent all the way to the runway. The results: a major reduction in fuel savings compared to the normal step-down approach currently in use today. All of us can relate to the step-down sensation as the pilot starts to descend to the airport, then throttles the aircraft forward, glides again and repeats this cyclical roller-coaster ride numerous times until landing.¶ Just imagine driving over a mountain path and reaching the top; just when you start heading down you put your car in neutral, this is essentially what the crew wants to do. The fuel savings and hence the reduced carbon footprint would be huge. Neighborhoods along the approach path would benefit from noise reductions too.¶ NEXT GENERATION AIR TRANSPORTATION SYSTEM (NEXTGEN)¶ NextGen is an estimated $40 Billion comprehensive overhaul of the US National Airspace System (NAS) to make air travel more convenient and reliable, while ensuring flights are as safe, secure and efficient as possible.¶ Considered by many to be the single biggest infrastructure endeavor ever undertaken, the failure to implement this would have an enormous negative impact on the US economy. The FAA estimates that by 2022, the failure to implement NextGen would cost the economy $22 Billion, annually, in lost economic activity - increasing to over $40 Billion by 2033.¶ The timetable to implement NextGen covers three phrases: Near-Term 2008-2012, Mid-Term 2012-2018 and Far-term 2018-2025. Wilson Felder, Director of the FAA William J. Hughes technical center, based in Atlantic City, NJ has already witnessed the positive effects of what the FAA calls the backbone of NextGen, titled Automatic Dependent Surveillance-Broadcast (ADSB).¶ Seven aircraft (including a Bombardier Global 5000) have been outfitted with ADS-B equipment and Mr. Felder has personally flown over sixty hours on board these aircraft, stating “ADS-B provides a tremendous piece of mind to the pilot in terms of safety” (by providing the pilot with a visual position of the other aircraft in the area and real-time weather all on one screen).¶ Currently a network of more than 850 ADS-B ground stations are being installed nationwide with completion scheduled for 2013. Ground stations have already been installed in strategic areas including the Gulf of Mexico, Hudson Bay, Alaska, Philadelphia and South Florida, and properly equipped aircraft are already benefiting from ADS-B in these regions.¶ ADS-B when implemented will completely transform how aircraft are tracked today, providing increased safety and accuracy. Today’s Air Traffic Controllers (ATC) use radar technology invented decades ago to track aircraft equipped with Transponders that react to the signal from the ground radar.¶ The inherent delays result in accuracy of the aircraft’s actual position to within one-two miles; hence the required three miles of aircraft separation required by the FAA. Position updates currently received every five-to-ten seconds will be increased to every second, reducing nose to tail separation of commercial and corporate aircraft currently set at 120 miles to five miles. Helicopters in the Gulf of Mexico once limited to one aircraft per 400 square mile grid are now allowed to fly to within five miles of each other.¶ S.W.I.M.¶ System Wide Information Management (SWIM) provides the infrastructure and services to deliver network-enabled information access to everyone in the industry that was once unattainable in the past. SWIM will allow more collaboration between the FAA and the airspace users who currently are unaware of all the information the FAA has available to them.¶ This information sharing system will work similar to a company intranet that will allow users to customize their access to look at specific work-related subjects like weather, airspace status and flight planning. Standard protocol and applications will be set and will alleviate the previous focus on unique, point-to-point interfaces. Thus, SWIM will allow people to get the information they need to make better informed decisions.¶ NextGen will also focus on a transformation from voice communication to data communication between ATC and the crew. With most aircraft equipped with data link capabilities already, the FAA will introduce data communications as an additional means of two-way interaction for ATC clearances, instructions, advisories, flight crew requests and reports. For those aircraft currently equipped with Satellite communications, they could benefit from the elimination of the noisy, and often unreliable HF reporting over the oceanic tracks.¶ The final two elements of NextGen will focus on a single national weather information system to provide real-time weather to the ground and air crew and a consolidation of the existing seventeen different voice switching systems used by NAS personnel into a single air/ground and ground/ground voice system.¶ SINGLE EUROPEAN SKY ATM RESEARCH (SESAR)¶ SESAR, the European equivalent of NextGen, was formed in 2007 by the European Commission and Eurocontrol, and consists of 15 founding members and 70 private companies. The mission is to form a single European sky initiative and develop a modernized air traffic management system for Europe.¶ The defined objectives are:¶ • Handle three times the air traffic;¶ • Increase safety by a factor of 10;¶ • Reduce environmental impact per flight by 10%;¶ • Save 8-14 minutes and 300-500kg of fuel per flight;¶ • Cut ATM costs 50%.¶ SESAR ranks as one of the most ambitious research and development projects ever launched by the European Community. Executed in cooperation with the 15 members and comprising of 16 work packages, SESAR unites the whole aviation community. Each work package has been divided between several of the founding members to reach an operational objective.¶ Environmental aspects are dealt with in all the work packages with a focus on fuel burn, the release of greenhouse and other gases from the engines and the concern for aircraft noise management.¶ There are many similar goals and objectives between Europe’s SESAR and the United States’ NextGen. Both are committed to the sharing of information via the SWIM program, and both have three phases of implementation. The near-term or Definition phase 2008-2012, mid-term or development phase 2012-2018 and far-term or deployment phase 2018-2025.¶ SO WHAT DOES THIS MEAN TO THE OPERATOR?¶ Many articles have already been written that compare the cost to implement NextGen and SESAR versus the benefit to airline and corporate operators. Some airlines have already spent tens of millions of dollars to equip their fleets while others are lobbying for Government subsidies.¶ As to this writer’s view, increasing our air space capacity, reducing delays, increasing safety and helping our environment through reduced carbon emissions, it’s a no-brainer. Even though the nearest mandate is years away (2020 for ADS-B in the United States), Australia and Europe have targeted earlier dates of 2012 and 2015 respectively. Properly equipped aircraft are already receiving the benefits of preferred routing in limited geographical areas.¶ ADS-B¶ As mentioned, a network of 850 ADS-B ground stations are currently being installed - and at last check were on track to be completed by 2013. On May 28, 2010, the FAA released the ADS-B final rule and stated all aircraft flying above 18,000 feet mean sea level (MSL) Class A airspace must have ADS-B Out performance capabilities using the 1090 MHz Extended Squitter (ES) broadcast link. Europe, Australia and other regions have also decided on the Extended Squitter technology. Since most corporate aircraft flying between Europe and the United States via the North Atlantic Tracks (NAT) already have Enhanced Surveillance (EHS) on their aircraft there will be “minimal” cost associated with meeting the requirements of ADS-B.¶ Simply put, Extended Squitter (ES) is a modification of your existing Mode “S” Transponders, which would be interfaced to the Flight Management System, Air Data Computers and/or the Inertial Reference systems to report aircraft position, velocity, projectory, Flight I.D. and other parameters ‘automatically’ to the ground.¶ Most Avionics shops could simply review your documentation for when you performed your EHS upgrade and provide you a comprehensive quote. Upgrade costs for corporate operators will run between $15,000.00 to $45,000.00 USD.¶ DATA COMMUNICATIONS¶ The current method of communication between an air traffic controller and the crew is voice communication, either by VHF line-of-sight technology or HF bands for longer over-the-pond flights. The problem is that all aircraft flying in a designated region are tuned to the same frequency and trying to talk to the air traffic controller. The crew must listen to all transmissions, then try to communicate themselves without accidentally overriding another crew.¶ Although English is the international language, accents coupled with degraded communications increase the chance for a miss-conceived message being carried out by the crew. Controller Pilot Data Link Communication (CPDLC) will be the solution moving forward. Similar to the Future Air Navigation System (FANS) designed by Boeing back in the mid-1990s, and designated by SESAR as the LINKS 2000+ program, CPDLC allows the crew and the controller to communicate via a data link for ATC communications.¶ Simulations carried out have shown the occupancy of the voice channel in congested airspace to decrease 75%, which increases flight safety and efficiency through more effective communications. The pilot simply “logs on” to the data link network via his CDU on the FMS using the aircraft registration, flight ID, departure and arrival points and the date. The pilot will then receive a message indicating he is “logged on”.¶ Anything from flight level changes to position-reporting over the NAT is now done without the need for voice communication. Although retrofit aircraft are not mandated before February of 2015, CPDLC is available in select areas of Europe as of this writing. Operators will need to obtain CPDLC operational authorization which will require pilots to provide proof of some sort of operational training.¶ FANS equipped aircraft are exempt from the mandate, but almost all of these aircraft fall under the airline category. Today’s corporate aircraft flying over the NAT are equipped with Dual FMS, Satcom and HF and simply by installing a compatible data link transceiver and a VHF antenna your aircraft will be properly equipped.¶ The transceiver would be interfaced to the FMS and send/receive data information either through the VHF band when line-of-sight is available, or over the Satcom when crossing the ocean. Upgrade costs are estimated to be $35,000.00 to $50,000.00 USD.¶ REQUIRED NAVIGATION PERFORMANCE (RNP)¶ On June 16th 2009, Novair flight NVR352 originating from Zakinthos, Greece received clearance to fly the RNP descent and approach into Stockholm airport runway 01R. This flight marked the beginning of SESAR’s plan to reduce carbon emissions by optimizing the descent profile and reducing the lateral track distance between aircraft through the use of RNP.¶ Aircraft navigation has long been constrained by the location of ground-based navigation aids, which restricted aircraft paths or airspace. RNP operations remove this reliance, thereby allowing aircraft better access and permitting flexibility of point-to-point routing. RNP is the ability of the onboard Navigation system; primarily the GPS equipped Flight Management System (FMS), to self-monitor the navigation performance it achieves and to inform the crew if the requirement is not met.¶ This onboard monitoring and alerting capability enhances the pilot’s situation awareness and can enable closer route spacing. Basic RNP operations are defined as RNP-2 en route, RNP-1 terminal and RNP-0.3 final approaches. The number signifies the total system error allowed; RNP-2 en route procedures require the total system error of not more than two nautical miles for 95 percent of the flight time.¶ The technology means airplanes don’t have to fly in straight lines for instrument landings: they can fly shorter, curved approaches in almost any weather condition. So airplanes that can handle RNP approaches will get priority from the air traffic controllers over aircraft that aren’t equipped. Shorter routes, coupled by idled descents and curved approaches will save operators tremendous costs on fuel which, in turn will greatly reduce carbon emissions. One US-based airline spent $175 Million USD to properly equip its aircraft and train its pilots, claiming it could recoup its investment if just one minute is shaved off each flight.¶ Besides the requirement to equip your aircraft, the crew has to be properly trained and the aircraft qualified and approved by the local regulatory agency. Certain RNP operations require advanced features of the onboard navigation systems along with approved training and procedures for the crew. These operations must receive approvals that are characterized as Special Aircraft and Aircrew Authorization Required (SAAAR), similar to approvals required for Category II and III approaches.¶ Operators need to evaluate their onboard Navigation equipment to see if they will meet the requirements of RNP. Most legacy equipment will have to be replaced, or at least modified to meet the new specifications.¶ New WAAS enabled Flight Management Systems will comply with the new rules and further enhance the aircraft capabilities, especially if your aircraft has been modified for Localizer Performance with Vertical Guidance (LPV) approaches.¶ Pricing to replace legacy equipment could easily exceed $100,000.00 USD. Although stricter mandates for RNP will not happen until 2015, operators need to understand what equipment and training their aircraft will need and budget both time and money to implement a program so their aircraft doesn’t have to join the back of the queue nearer the time.

#### Next Gen will reduce airline industry's contribution to pollution - decreases jet emissions

Lawrence 12,(Noel, staff writer for Ehow, Stanford Graduate, “Environmental Considerations in Nextgen”, 2012, AD: 07/09/12, <http://www.ehow.com/info_8015651_environmental-considerations-nextgen.html> | Kushal)

NextGen encompasses a set of programs, procedures and technologies that will transform the United States national airspace system (NAS). At present, air traffic control relies upon ground-based systems. NextGen will allow it to become satellite-based through standard GPS. The new system will safely allow for planes to fly more closely together on more direct routes. This change will have a positive environmental impact in and of itself. Additionally, NextGen also involves FAA initiatives in science, technology, and public policy that will further reduce pollution. Air Quality Satellite-based technologies will increase aircraft efficiency both in the sky and on the tarmac. Shorter routes mean less fuel consumption by airplanes. Less fuel consumption means less carbon emissions. As a result, air quality will improve. Further, less greenhouse gasses will slow down global warming. And, of course, less fuel consumption means less pollution caused by oil drilling. Alternative Fuels Though flight distances and times may save fuel, this could be offset by an increase in traffic. As a result, the FAA has developed a "five-pillar strategy" in relation to NextGen that is discussed in detail within their "Overview of Select AEE Activities" presentation. Along with upgrading air traffic management systems, the FAA will help facilitate initiatives in science, technology, and public policy to reduce the environmental footprint of airplanes. One area of promise is the use of alternative fuels. In cooperation with government and industry partners, the FAA spearheads efforts to create sustainable alternative jet fuels through its Commercial Aviation Alternative Fuels Initiative (CAAFI). In 2010, the FAA achieved approval of an alternative-fuel specification consisting of a 50/50 blend of Fisher-Tropsch processed fuel with conventional Jet A fuel.

#### NextGen keeps 14M tons of CO2 from entering the atmosphere by 2018 - could reduce delays by 35%

FAA 11 (“NextGen Implementation Plan Executive Summary” March 2011. Pg. 1 <http://www.faa.gov/nextgen/media/executive_summary_2011.pdf>) Foster

As airports and operators reap the benefits of the investments and deployments we are making today, the FAA continues to sharpen its projections of the benefits we expect NextGen to provide during the mid-term. Our latest estimates, which are sensitive to traffic and fuel price forecasts, indicate that by 2018, NextGen will reduce total delays (in-flight and on the ground) by about 35 percent compared with what would happen if we did nothing. That delay reduction will provide, through 2018, $23 billion in cumulative benefits to aircraft operators, the traveling public and the FAA. In the process, we will save about 1.4 billion gallons of aviation fuel during this period, reducing carbon dioxide emissions by 14 million tons.

### Environment Exts - Next Gen Solves - Flight patterns

#### Next Gen solves emissions by decreasing length of flight plans, increasing navigational capability, decreasing weather delays, and the use of lower power levels

Fleming 8 (Aviation and Climate Change: Aircraft Emissions Expected to Grow, but Technological and Operational Improvements and Government Policies Can Help Control Emissions June 8, 2009 Statement of Susan Fleming, Director, Physical Infrastructure Issues. June 8, 2009 This is a GAO report. LexisNexis.) Foster

NextGen has the potential to reduce fuel consumption and emissions through technologies and operational procedures: -- NextGen makes use of air traffic technologies to reduce emissions. For example, the Automatic Dependent Surveillance- Broadcast (ADS-B) satellite navigation system is designed to enable more precise control of aircraft during flight, approach, and descent, allowing for more direct routing and thus reducing fuel consumption and emissions. Also, Area Navigation (RNAV) will compute an aircraft's position and ground speed and provide meaningful information on the flight route to pilots, enabling them to save fuel through improved navigational capability. NextGen Network-Enabled Weather will provide real-time weather data across the national airspace system, helping reduce weather- related delays and allowing aircraft to best use weather conditions to improve efficiency. -- NextGen also relies on operational changes that have demonstrated the potential to reduce fuel consumption and emissions rates. Continuous Descent Arrivals (CDA) allow aircraft to remain at cruise altitudes longer as they approach destination airports, use lower power levels, and therefore produce lower emissions during landings. CDAs are already in place in a number of U.S. airports and according to FAA, the use of CDAs at Atlanta Hartsfield International Airport reduces carbon dioxide emissions by an average of about 1,300 pounds per flight. Required Navigation Performance (RNP) also permits an aircraft to descend on a more precise route, reducing its consumption of fuel and lowering its carbon dioxide emissions. According to FAA, over 500 RNAV and RNP procedures and routes have been implemented. Funding and other challenges, however, affect FAA's implementation of these various NextGen procedures and technologies.40

### Environment Exts - Next Gen solves - Technological Advancements

#### Not only does Next Gen decrease emissions by changing flight patterns and delays, but it also jumpstarts technological innovation to make planes more efficient

Fleming 8 (Aviation and Climate Change: Aircraft Emissions Expected to Grow, but Technological and Operational Improvements and Government Policies Can Help Control Emissions June 8, 2009 Statement of Susan Fleming, Director, Physical Infrastructure Issues. June 8, 2009 This is a GAO report. LexisNexis.)

Air Traffic Management Improvements through NextGen Will Incorporate Technological and Operational Improvements to Help Reduce Aircraft Emissions According to Experts

According to FAA, some of the air traffic management improvements that are part of NextGen--the planned air traffic management system designed to address the impacts of future traffic growth-- can help reduce aircraft fuel consumption and emissions in the United States. Besides improving air traffic management, NextGen has environmental goals, which include accelerating the development of technologies that will lower emissions and noise. According to FAA, it is conducting a review to develop a set of NextGen goals, targets and metrics for climate change, as well as for noise and local air quality emissions. NextGen has the potential to reduce aircraft fuel burn by 2025, according to FAA, in part through technologies and procedures that reduce congestion and create more direct routing. Some procedures and technologies of NextGen have already been implemented and have already led to emissions reductions. Similarly, in Europe through the Single European Sky Air Traffic Management Research Program (SESAR), air traffic management technologies and procedures will be upgraded and individual national airspace systems will be merged into one, helping to reduce emissions per flight by 10 percent according to EUROCONTROL, the European Organization for the Safety of Air Navigation. However, some experts we met with said that because some of SESAR's technologies and procedures have already been implemented, future fuel savings might be lower. Table 5 provides information on selected components of NextGen that hold potential for reducing aircraft emissions.

### Environment Exts - Warming exists

#### Warming is real and anthropogenic - scientific consensus

Science Daily 9 [“Scientists agree human-induced global warming is real, survey says”, *,* January 10, <http://www.sciencedaily.com/releases/2009/01/090119210532.htm>] ttate

A group of 3,146 earth scientists surveyed around the world overwhelmingly agree that in the past 200-plus years, mean global temperatures have been rising, and that human activity is a significant contributing factor in changing mean global temperatures. Peter Doran, University of Illinois at Chicago associate professor of earth and environmental sciences, along with former graduate student Maggie Kendall Zimmerman, conducted the survey late last year. The findings appear January 19 in the publication Eos, Transactions, American Geophysical Union. In trying to overcome criticism of earlier attempts to gauge the view of earth scientists on global warming and the human impact factor, Doran and Kendall Zimmerman sought the opinion of the most complete list of earth scientists they could find, contacting more than 10,200 experts around the world listed in the 2007 edition of the American Geological Institute's Directory of Geoscience Departments.

### Environment Exts - Warming Bad - Anthropogenic

#### Warming is anthropogenic

Serreze 2010 [Mark C - Cooperative Institute for Research in Environmental Sciences @ University of Colorado, "Understanding Recent Climate Change", *Conservation Biology*, January 15, [http://dl2af5jf3e.search.serialssolutions.com/?ctx\_ver=Z39.88-2004&ctx\_enc=info%3Aofi%2Fenc%3AUTF-8&rfr\_id=info:sid/ summon.serialssolutions.com&rft\_val\_fmt=info:ofi/fmt:kev:mtx:journal&rft.genre=article&rft.atitle=Understanding+Recent+Climate+Change&rft.jtitle=Conservation+Biology&rft.au=Serreze%2C+Mark+C&rft.date=2010-02-01&rft.pub=Blackwell+Publishing%3BSociety+for+Conservation+Biology&rft.issn=0888-8892&rft.volume=24&rft.issue=1&rft.spage=10&rft.epage=17](http://dl2af5jf3e.search.serialssolutions.com/?ctx_ver=Z39.88-2004&ctx_enc=info%3Aofi%2Fenc%3AUTF-8&rfr_id=info:sid/summon.serialssolutions.com&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&rft.genre=article&rft.atitle=Understanding+Recent+Climate+Change&rft.jtitle=Conservation+Biology&rft.au=Serreze%2C+Mark+C&rft.date=2010-02-01&rft.pub=Blackwell+Publishing%3BSociety+for+Conservation+Biology&rft.issn=0888-8892&rft.volume=24&rft.issue=1&rft.spage=10&rft.epage=17)] ttate

The Earth's atmosphere has a natural greenhouse effect, without which the global mean surface temperature would be about 33 °C lower and life would not be possible. Human activities have increased atmospheric concentrations of carbon dioxide, methane, and other gases in trace amounts. This has enhanced the greenhouse effect, resulting in surface warming. Were it not for the partly offsetting effects of increased aerosol concentrations, the increase in global mean surface temperature over the past 100 years would be larger than observed. Continued surface warming through the 21st century is inevitable and will likely have widespread ecological impacts. The magnitude and rate of warming for the global average will be largely dictated by the strength and direction of climate feedbacks, thermal inertia of the oceans, the rate of greenhouse gas emissions, and aerosol concentrations. Because of regional expressions of climate feedbacks, changes in atmospheric circulation, and a suite of other factors, the magnitude and rate of warming and changes in other key climate elements, such as precipitation, will not be uniform across the planet. For example, due to loss of its floating sea-ice cover, the Arctic will warm the most.

### Environment Exts - Warming Brinks

#### We are getting close to the point of no return - earth will soon be at a point that natural feedbacks will make warming irreversible and unstoppable

Dyer 12 “Rio+20: How bad could it get?” Hamilton Spectator (Ontario, Canada), June 19, 2012 Tuesday, OPINION; Pg. A19, 754 words, Gwynne Dyer. FOSTER

The scientific consensus is that we are still on track for 5.2 degrees of warming by 2100, but that's just warming caused by human greenhouse-gas emissions. The problem is that +3 degrees is well past the point where the major feedbacks kick in: Natural phenomena triggered by our warming, like melting permafrost and the loss of Arctic sea-ice cover, that will add to the heating and that we cannot turn off.

The trigger is actually around 3.5 degrees higher average global temperature. After that we lose control of the process: Ending our own carbon-dioxide emissions would no longer be enough to stop the warming. We may end up trapped on an escalator heading up to 10.5 degrees, with no way of getting off. And +6 degrees C gives you the mass extinction.

There have been five mass extinctions in the past 500 million years, when 50 percent or more of the species then existing on the Earth vanished, but until recently the only people taking any interest in this were paleontologists, not climate scientists. They did wonder what had caused the extinctions, but the best answer they could come up was "climate change." It wasn't a very good answer.

Why would a warmer or colder planet kill off all those species? The warming was caused by massive volcanic eruptions dumping huge quantities of carbon dioxide in the atmosphere for tens of thousands of years. But it was very gradual, and the animals and plants had plenty of time to migrate to climatic zones that still suited them.

There had to be a more convincing kill mechanism than that, and the paleontologists found one when they discovered that a giant asteroid struck the planet 65 million years ago, just at the time when the dinosaurs died out in the most recent of the great extinctions. So they went looking for evidence of huge asteroid strikes at the time of the other extinction events. They found none.

What they discovered was that there was indeed major warming at the time of all the other extinctions -- and that the warming had radically changed the oceans. The currents that carry oxygen-rich cold water down to the depths shifted so that they were bringing down oxygen-poor warm water instead, and gradually the depths of the oceans became anoxic: The deep waters no longer had any oxygen.

When that happens, the sulfur bacteria that normally live in the silt (because oxygen is poison to them) come out of hiding and begin to multiply. Eventually they rise all the way to the surface over the whole ocean, killing all the oxygen-breathing life. The ocean also starts emitting enormous amounts of lethal hydrogen sulfide gas that destroy the ozone layer and directly poison land-dwelling species. This has happened many times in the Earth's history.

Don't let it worry you. We'll all be safely dead long before it could happen again: The earliest possible date for a mass extinction, assuming that the theory is right and that we continue down our present track with emissions, would be well into the next century.

The only problem is that things like this tend to become inevitable long before they actually happen. Tick, tock.

### Environment Exts - Warming Impacts - Laundry List

#### Unchecked climate change leads to every major impact - famine, drought, resource wars, ecological devastation and nuclear war

Pfeiffer 2004 [Dale - geologist, "Global climate change and peak oil", *The Wilderness Publications,* http://www.fromthewilderness.com/free/ww3/072004\_global\_climate3.shtml] ttate

But the real importance of the report lies in the statement of probability and in the authors' recommendations to the President and the National Security Council. While no statistical analysis of probability is given in the report as it has been released (any such statistical analysis would most likely be classified), the authors state that “the plausibility of severe and rapid climate change is higher than most of the scientific community and perhaps all of the political community is prepared for.”6 They say that instead of asking whether this could happen, we should be asking when this will happen. They conclude: “It is quite plausible that within a decade the evidence of an imminent abrupt climate shift may become clear and reliable.”7 From such a shift, the report claims, utterly appalling ecological consequences would follow. Europe and Eastern North America would plunge into a mini-ice age, with weather patterns resembling present day Siberia. Violent storms could wreak havoc around the globe. Coastal areas such as The Netherlands, New York, and the West coast of North America could become uninhabitable, while most island nations could be completely submerged. Lowlands like Bangladesh could be permanently swamped. While flooding would become the rule along coastlines, mega-droughts could destroy the world's breadbaskets. The dust bowl could return to America's Midwest. Famine and drought would result in a major drop in the planet's ability to sustain the present human population. Access to water could become a major battleground – hundreds of millions could die as a result of famine and resource wars. More than 400 million people in subtropical regions will be put at grave risk. There would be mass migrations of climate refugees, particularly to southern Europe and North America. Nuclear arms proliferation in conjunction with resource wars could very well lead to nuclear wars.8 And none of this takes into account the effects of global peak oil and the North American natural gas cliff. Not pretty.

### Environment Exts - Warming Impacts - Phytoplankton

#### Warming kills phytoplankton—creates runaway global warming

The Week 10 (“Is ocean life being wiped out?” The Week is a weekly news magazine that reports a variety of topics. August 3, 2010 <http://theweek.com/article/index/205607/is-ocean-life-being-wiped-out>) Foster

They may sit at the bottom of the undersea food chain, but plant plankton, or phytoplankton, perform a vital service to life on Earth. The microscopic algae provide energy for underwater life, absorb carbon dioxide, and produce half the world's oxygen. But they are disappearing from our oceans at an alarming rate. A brief guide to the worrying decline in plant plankton levels:¶ What exactly are phytoplankton?¶ Phytoplankton are tiny plants that provide the foundation for the entire marine ecosystem. They supply nutrients and energy to zooplankton, the smallest creatures in the ocean. Zooplankton, in turn, feed fish and other marine life. Phytoplankton also absorb carbon dioxide and produce oxygen. Scientists say that much of the oxygen in our atmosphere was produced by plant plankton, though photosynthesis, over the past 2 billion years.¶ How rapidly are they disappearing?¶ Very rapidly indeed. A new study in the journal Nature has found that worldwide phytoplankton levels have been declining steadily since 1899. They are down 40 percent since 1950, and drop by about 1 percent every year. "Phytoplankton is the basic currency for everything going on in the ocean," said Boris Worm, one of the study's authors. "It's almost like a recession... that has been going on for decades."¶ Why are they in such rapid decline?¶ The primary suspect is global warming, according to the report. The ocean temperature has risen by between 0.5 and 1 degree Celsius in the past century. As surface water gets warmer, it doesn't mix as well with colder, deeper water that is rich in nutrients the phytoplankton need. But the report adds that phytoplankton have also disappeared from cold regions, such as the Arctic Ocean, where phytoplankton growth is mainly limited by sunlight — meaning that "changes in wind and ocean circulation" might also be to blame.¶ Why does all this matter?¶ It's bad news for all creatures that rely on the oceans for food — from fish to whales to seabirds. Our fish stocks, which are already affected by overfishing and climate change, will diminish further if the decline continues. And there will be fewer plants to absorb the harmful CO2 in our atmosphere.¶ What happens if the phytoplankton die out?¶ We'll have dead seas, and a rapid build-up of CO2 in our atmosphere which would theoretically speed up the effects of global warming. But the report's authors say there is no evidence to suggest the decline is terminal.¶ What do the pundits say?¶ It's yet another argument in favor of controlling our carbon emissions, says Michael Graham Richard at Treehugger. "When you don't understand how your life-support system works, you should be more careful when tinkering with it." Let's not "succumb to outright panic quite yet," says Megan McArdle in The Atlantic. Nature has a way of offsetting big changes — won't all the extra carbon "make terrestrial plants grow more lushly"? Besides, this is just "one paper" — phytoplankton might not be in the dire shape these researchers think. "When you add this to the decline in butterflies, bees and beetles, says Michael Marshall at the New Scientist, it's a "remarkably bad piece of news." These tiny creatures do the "lion's share" of sustaining life on Earth and they're dying out. "Never mind the pandas. It's plankton, bugs, and fungi you should be worrying about."

#### And, Phytoplankton forms the base of the ocean food chain - key to all marine biodiversity

Morello 10 (Lauren, a staff writer for Scientific American. “Phytoplankton Population Drops 40 Percent Since 1950” July 29, 2010 <http://www.scientificamerican.com/article.cfm?id=phytoplankton-population>) Foster

Researchers at Canada's Dalhousie University say the global population of phytoplankton has fallen about 40 percent since 1950. That translates to an annual drop of about 1 percent of the average plankton population between 1899 and 2008.¶ The scientists believe that rising sea surface temperatures are to blame.¶ "It's very disturbing to think about the potential implications of a century-long decline of the base of the food chain," said lead author Daniel Boyce, a marine ecologist.¶ They include disruption to the marine food web and effects on the world's carbon cycle. In addition to consuming CO2, phytoplankton can influence how much heat is absorbed by the world's oceans, and some species emit sulfate molecules that promote cloud formation.¶ A continuing mystery story¶ "In some respect, these findings are the beginning of the story, not the end," Boyce said. "The first question is what will happen in the future. We looked at these trends over the past century but don't know what will happen 10 years down the road."¶ The study "makes a sorely needed contribution to our knowledge of historical changes in the ocean biosphere," said David Siegel of the University of California, Santa Barbara, and Bryan Franz of NASA in an essay, also published in Nature.¶ "Their identification of a connection between long-term global declines in phytoplankton biomass and increasing ocean temperatures does not portend well for [ocean] ecosystems in a world that is likely to be warmer," they wrote. "Phytoplankton productivity is the base of the food web, and all life in the sea depends on it."¶ Boyce said he and his co-authors began their study in an attempt to get a clearer picture of how phytoplankton were faring, given that earlier studies that relied on satellite measurements produced conflicting results.

#### Plankton declines caused by warming—hot and cold water can’t mix

O’Hanlon 6 (Larry, a staff writer for Discovery News. “Ocean Warming Withers Food Chain” December 7, 2006 <http://dsc.discovery.com/news/2006/12/07/oceanwarming_pla.html?category=earth&guid=20061207093000>) Foster

Almost ten years of unprecedented color satellite imagery of Earth’s oceans has now made one thing crystal clear: When the water gets warmer, ocean life declines.¶ The orbiting Sea-viewing Wide Field-of-view Sensor (SeaWiFS) has been collecting data on the colors of the oceans since 1997. That global data, combined with detailed ocean temperature data, shows an undeniable connection between the vibrancy of phytoplankton — the microscopic plants that anchor the ocean food web — and the temperature of the water, scientists announced on Wednesday.¶ "On a global scale there’s a very strong correlation between climate and ocean plants," said Michael Behrenfeld, an ocean plant ecologist at Oregon State University in Corvallis. "(Phytoplankton) are very sensitive to changes in climate."¶ Behrenfeld is the lead author of a report on the correlation in the Dec. 7 issue of the journal Nature.¶ The climate connection in the oceans is hugely important, Behrenfeld explained, because phytoplankton is the food of the animals that, in turn, are the mainstay of the fish we eat.¶ What’s more, the tiny green plants are also a gigantic player in fighting the rise in the greenhouse gas carbon dioxide in our atmosphere. It’s estimated that ocean plants account for about half the Earth’s capacity to absorb carbon dioxide, he said.¶ Just how warmer waters hurt phytoplankton is a tad more complex.¶ What happens, said Behrenfeld, is that warmer waters stay on the surface because they are more buoyant. It’s in those sunny surface waters where phytoplankton needs to be.¶ The problem is that when the surface waters are dramatically warmer than the waters deeper down, there's a lot less mixing of waters up and down. This hurts the phytoplankton because it’s the deeper cold waters that contain the nutrients they need to thrive.¶ SeaWiFS has caught all this going on by looking at the color of ocean waters, everyday, all over the planet. Phytoplankton contain chlorophyll, which is what makes them green.¶ "So the less phytoplankton, the bluer the water," said oceanographer Gene Feldman who manages the SeaWiFS project at NASA’s Goddard Space Flight Center.¶ "What we have here is a long-term record," Feldman said. "That’s really significant."¶ In fact, it’s the only way to test the theories and models that had predicted this sort of thing, Feldman explained. The same data would have been impossible to collect from a ship.¶ "We can measure from the satellite in one minute what we could by steering around a ship for ten years," said Feldman.¶ "This is incredibly important to life on Earth as we know it," commented Oscar Schofield, an aquatic biologist at Rutgers University.¶ Not only do ocean plants feed fish and eat carbon dioxide, he pointed out, they also create much of the oxygen that we breathe. That’s why everyone should be very interested in how climate change affects the oceans.¶ What the study suggests is that global warming will cause a decrease in phytoplankton production in tropical seas, where the waters are due to get warmer, Behrenfeld said. Meanwhile, higher latitude waters could get greener, he said.¶ The consequent shifts in food for local ocean wildlife are expected to be dramatic and could have a disastrous effect on fisheries.

### Environment Exts - Warming Impacts - Biodiversity Loss

#### UN affirms link between biodiversity loss and extinction---decline of wildlife species means human extinction

**Buczynski 10**, Freelance writer, editor, and green brand supporter—Writer at Revmodo.com, EarthTechling.com, CrispGreen.com, EV Update, 1800Recycling.com, EcoSphericBlog.com, 10/18/10[Beth, “UN: Loss Of Biodiversity Could Mean End Of Human Race, care2.com, <http://www.care2.com/causes/un-humans-are-rapidly-destroying-the-biodiversity-ne.html#ixzz20nZKAzW1]ADravid>

**UN officials gathered** at the Convention on Biological Diversity (CBD) **in Japan have issued a global warning that the rapid loss of animal and plant species that has characterized the past century must end if humans are to survive.** **Delegates** in Nagoya plan to **set a** new **target for 2020 for curbing species loss,** and will discuss boosting medium-term financial help for poor countries to help them protect their wildlife and habitats (Yahoo Green). “**Business as usual is no more an option for mankind,”** CBD executive secretary Ahmed Djoghlaf said in his opening statements. “**We need a new approach, we need to reconnect with nature and live in harmony with nature into the future**.” The CBD is an international legally-binding treaty with three main goals: conservation of biodiversity; sustainable use of biodiversity; fair and equitable sharing of the benefits arising from the use of genetic resources. Its overall objective is to encourage actions which will lead to a sustainable future. As Djoghlaf acknolwedged in his opening statements, facing the fact that many countries have ignored their obligation to these goals is imperitive if progress is to be made in the future. “**Let us have the courage to look in the eyes of our children and admit that we have failed, individually and collectively, to fulfil the Johannesburg promise made to them by the 110 Heads of State and Government to substantially reduce the loss of biodiversity by 2010**,” Djoghlaf stated. “**Let us look in the eyes of our children and admit that we continue to lose biodiversity at an unprecedented rate, thus mortgaging their future.”** Earlier this year, **the U.N. warned several eco-systems including the Amazon rainforest, freshwater lakes and rivers and coral reefs are approaching a “tipping point” which, if reached, may see them never recover.** According to a study by UC Berkeley and Penn State University researchers, between 15 and 42 percent of the mammals in North America disappeared after humans arrived. **Compared to extinction rates demonstrated in other periods of Earth’s history**, this means that **North American species are already half way to to a sixth mass extinction, similar to the one that eliminated the dinosaurs. The same is true in many other parts of the world. The third edition of the Global Biodiversity Outlook demonstrates that, today, the rate of loss of biodiversity is up to one thousand times higher than the background and historical rate of extinction. The Earth’s 6.8 billion humans are effectively living 50 percent beyond the planet’s biocapacity in 2007, according to a new assessment by the World Wildlife Fund that said by 2030 humans will effectively need the capacity of two Earths in order to survive.**

#### Unchecked global warming will lead to massive biodiversity loss - it has a multiplier effect that leads to more species loss

National Geographic News 4 (“By 2050 Warming to Doom Million Species, Study Says” National Geographic News. July 12, 2004 <http://news.nationalgeographic.com/news/2004/01/0107_040107_extinction.html>) Foster

Study Results¶ According to the researchers' collective results, the predicted range of climate change by 2050 will place 15 to 35 percent of the 1,103 species studied at risk of extinction. The numbers are expected to hold up when extrapolated globally, potentially dooming more than a million species.¶ "These are first-pass estimates, but they put the problem in the right ballpark … I expect more detailed studies to refine these numbers and to add data for additional regions, but not to change the general import of these findings," said Hannah.¶ Writing in an accompanying commentary to the study in Nature, J. Alan Pounds of the Monteverde Cloud Forest Reserve in Costa Rica, and Robert Puschendorf, a biologist at the University of Costa Rica, say these estimates "might be optimistic."¶ As global warming interacts with other factors such as habitat-destruction, invasive species, and the build up of carbon dioxide in the landscape, the risk of extinction increases even further, they say.

"The threat to life on Earth is not just a problem for the future. It is part of the here and now," they write. Climate Scenarios¶ The researchers based their study on minimum, mid-range, and maximum future climate scenarios based on information released by the United Nation's Intergovernmental Panel on Climate Change (IPCC) in 2001.¶ According to the IPCC, temperatures are expected to rise from somewhere between 1.5 and more than 4 degrees Fahrenheit (0.8 and more than 2 degrees Celsius) by the year 2050.¶ "Few climate scientists around the world think that 2050 temperatures will fall outside those bounds," said Thomas. "In some respects, we have been conservative because almost all future climate projections expect more warming and hence more extinction between 2050 and 2100."¶ In addition, the researchers accounted for the ability of species to disperse or successfully move to a new area, thus preventing climate change-induced extinction. They used two alternatives: one where species couldn't move at all, the other assuming unlimited abilities for movement.¶ "We are trying to bracket the truth," said Peterson. "If you bracket the truth and look at the two endpoints and they give the same general message, then you can start to believe it."¶ Outside of the small group of researchers working directly on the impacts of climate change to species diversity, "the numbers will come as a huge shock," said Thomas.

#### Global Warming tied to extreme biodiversity loss---anthropogenic warming kills genetic variations

**Science Daily 11**, A news website dealing with science research and current events—Provides information on a variety of scientific topics (I.E. anthropology, biology, climate)—Articles are selected from news releases by Universities and research programs—over two million people visit the site each month, 8/24/11[Science Daily, “Global Warming May Cause Higher Loss of Biodiversity Than Previously Thought” Science Daily, http://www.sciencedaily .com/releases/2011/08/110824091146.ht m]ADravid

ScienceDaily (Aug. 24, 2011) — **If global warming continues as expected, it is estimated that almost a third of all flora and fauna species worldwide could become extinct.** Scientists from the Biodiversity and Climate Research Centre

(Biodiversität und Klima Forschungszentrum, BiK-F) and the SENCKENBERG Gesellschaft für Naturkunde discovered that **the proportion of actual biodiversity loss should quite clearly be revised upwards: by 2080, more than 80 % of genetic diversity within species may disappear in certain groups of organisms, according to researchers** in the title story of the journal Nature Climate Change. **The study is the first world-wide to quantify the loss of biological diversity on the basis of genetic diversity. Most common models on the effects of climate change on flora and fauna concentrate on "classically" described species, in other words groups of organisms that are clearly separate from each other morphologically**. Until now, however, so-called cryptic diversity has not been taken into account. It encompasses the diversity of genetic variations and deviations within described species, and can only be researched fully since the development of molecular-genetic methods. As well as the diversity of ecosystems and species, these genetic variations are a central part of global biodiversity. In a pioneering study, scientists from the Biodiversity and Climate Research Centre (BiK-F) and the Senckenberg Gesellschaft für Naturkunde have now examined the influence of global warming on genetic diversity within species. **Over 80 percent of genetic variations may become extinct The distribution of nine European aquatic insect species, which still exist in the headwaters of streams in many high mountain areas in Central and Northern Europe, was modelled. They have already been widely researched, which means that the regional distribution of the inner-species diversity and the existence of morphologically cryptic, evolutionary lines are already known. If global warming does take place in the range that is predicted by the Intergovernmental Panel on Climate Change (IPCC), these creatures will be pushed back to only a few small refugia, e.g. in Scandinavia and the Alps, by 2080, according to model calculations.** **If Europe's climate warms up by up to two degrees only, eight of the species examined will survive, at least in some areas; with an increase in temperature of 4 degrees, six species will probably survive in some areas by 2080. However, due to the extinction of local populations, genetic diversity will decline to a much more dramatic extent.** According to the most pessimistic projections, 84 percent of all genetic variations would die out by 2080**; in the "best case," two-thirds of all genetic variations would disappear**. The aquatic insects that were examined are representative for many species of mountainous regions of Central Europe. Slim chances in the long term for the emergence of new species and species survival Carsten Nowak of the Biodiversity and Climate Research Centre (BiK-F) and the Senckenberg Gesellschaft für Naturkunde, explains: "Our models of future distribution show that the "species" as such will usually survive. However, the majority of the genetic variations, which in each case exist only in certain places, will not survive. This means that self-contained evolutionary lineages in other regions such as the Carpathians, Pyrenees or the German Central Uplands will be lost. Many of these lines are currently in the process of developing into separate species, but will become extinct before this is achieved, if our model calculations are accurate." **Genetic variation within a species is also important for adaptability to changing habitats and climatic conditions. Their loss therefore also reduces the chances for species survival in the long term. New approach for conservation So the extinction of species hides an ever greater loss, in the form of the massive disappearance of genetic diversity. "The loss of biodiversity that can be expected in the course of global warming has probably been greatly underestimated in previous studies, which have only referred to species numbers,**" says Steffen Pauls, Biodiversity and Climate Research Centre (BiK-F), of the findings. However, there is also an opportunity to use genetic diversity in order to make conservation and environmental protection more efficient. A topic that is subject to much discussion at present is how to deal with conservation areas under the conditions of climate change. The authors of the study urge that conservation areas should also be oriented to places where both a suitable habitat for the species and a high degree of inner-species genetic diversity can be preserved in the future. **"It is high time,"** says Nowak, **"that we see biodiversity not only as a static accumulation of species, but rather as a variety of evolutionary lines that are in a constant state of change. The loss of one such line, irrespective of whether it is defined today as a "species" in itself, could potentially mean a massive loss in biodiversity in the future."**

#### Warming leads to a mass species extinction—we’re on the brink *now*

Reuters 11 (“Is Earth due for a mass extinction?” Reuters is an international news agency. March 3, 2011 <http://blogs.reuters.com/environment/2011/03/03/is-earth-due-for-a-mass-extinction/>) Foster

It has all the signs of a sick good-news/bad-news tale. The bad news is that Earth may be ripe for a mass extinction, where 75 percent or more of the life on the planet vanishes forever.¶ The good news is it’s unlikely to happen for at least three more centuries.¶ Scientists writing in the journal Nature warn that we could be on the brink of a mass extinction, the kind of species loss that has happened just five times in the last 540 million years.¶ “If you look only at the critically endangered mammals–those where the risk of extinction is at least 50 percent within three of their generations–and assume that their time will run out and they will be extinct in 1,000 years, that puts us clearly outside any range of normal and tells us that we are moving into the mass extinction realm,” Anthony Barnosky, an integrative biologist at the University of California at Berkeley said in a statement about the study he co-wrote.¶ Are humans to blame? Possibly.¶ “A modern global mass extinction is a largely unaddressed hazard of climate change and human activities,” said H. Richard Lane of the National Science Foundation, which funded the research.¶ If the species that are now considered critically endangered, endangered and vulnerable actually went extinct, and that rate of extinction continued, the sixth mass extinction could arrive in three to 22 centuries, Barnosky said.¶ This is by no means a sure thing, and the scientists said there is still time to save endangered species short of a tipping point. That would require dealing with a perfect storm of threats, including habitat fragmentation, invasive species, disease and global warming.¶ The last mass extinction was 65 million years ago when a space rock slammed into what is now the Yucatan peninsula, one of several factors that caused the big die-off. Previous events occurred 200 million years ago, 251 million years ago, 359 million years ago and 443 million years ago.

### Environment Exts - Warming Impacts - Ocean Acidification

#### Warming induced ocean acidification disrupts the foundation of the ocean food chain

Cantwell 7 (Maria, chair of the Senate Committee on Oceans, Atmosphere, Fisheries, and Coast Guard—from an address to the Senate committee. LexisNexis May 10, 2007) Foster

And to give one example from my home state, the Intergovernmental Panel on Climate Change recently reported that the mountain snowpack that feeds the Columbia River system is shrinking away, producing less and less water for the rivers every year. While these easy-to-see impacts of global warming are highly disturbing, we are here today to examine impacts that are not quite as visible, but just as severe - those that occur beneath the surface of the ocean. The impact of climate change on our coastal communities from sea level rise and increased storm intensity has been the focus of much attention. But climate change also poses risks to our nation's multi-billion dollar fishing industry. In fact, global warming could threaten the very integrity of ocean ecosystems and possibly wipe out more vulnerable ecosystems like coral reefs. These are frightening possibilities - but very real ones. While it may not be easy to physically see the impacts of global warming in the ocean, it is vital that we examine them. If we wait until these problems are too painful and too obvious to ignore, it will be far too late. Carbon Dioxide in the Oceans: Ocean Acidification While carbon dioxide is accumulating in our atmosphere, it is also being absorbed by our oceans. Approximately one-third of our carbon dioxide emissions end up in the oceans. For decades, we assumed that the oceans absorbed these greenhouse gases to the benefit of our atmosphere with no side-effect for the seas. Emerging science now shows we were wrong. Thanks in no small part to the work of our panelists, we now know that the absorption of carbon dioxide actually changes the very chemistry of the ocean: -- Seawater becomes more acidic, and begins to withhold the basic chemical building blocks needed by many marine organisms. -- Coral reefs - the rainforests of the sea - cannot build their skeletons. -- In colder waters, scientists predict a more acidic ocean could dissolve the shells of the tiny organisms that make up the base of the ocean's food chain. When it comes to ocean acidification, we risk not just damaging the ocean's ecosystem - we are threatening its very foundation. The social and economic costs to the world's fisheries and fishery-dependant communities are incalculable. Managers at the local, state, and regional levels must be able to anticipate and develop strategies to address these threats. Washington State The dangers of global climate change and ocean acidification can be illustrated well with one brief example from my home state of Washington. As most of you probably know, Washington State is home to a number of important salmon populations. Salmon are a $330 million industry in the Pacific, and a cultural icon of the Northwest. As I mentioned earlier, global warming will continue to reduce the snowpack that feeds our rivers. With each coming season there will be less water, and the water will probably get warmer. Salmon rely on predictable and steady river flows for their survival. In the sea, young salmon depend on a food chain based on zooplankton. As ocean acidification takes hold, these organisms may no longer be able to survive. Conclusion Every coastal state can point to examples like this of the impacts of climate change on our ocean. And these examples are far too important to be ignored. Both global warming and ocean acidification have the same cause and the same solution: we must reduce our emissions of carbon dioxide. If we fail to address the potential impact of global climate change and ocean acidification, we may be jeopardizing all of our hard-fought ocean conservation gains. Those are difficult words to hear, but they reflect a difficult reality. Thank you all again for joining us today and for your hard work advancing this complicated, but necessary dialogue. I look forward to your testimony. Senator Snowe, your opening remarks?

#### CO2 ocean acidification irreversible

Mitchell 6 (Anthony, a writer for the Associated Press. “Oceans turning acidic and threatening food chain, says expert” November 10, 2006 LexisNexis.) Foster

The world's oceans are becoming more acidic because of the amount of carbon dioxide they have absorbed, threatening sea life and the planet's fragile food chain, a climate expert said.¶ Oceans have already absorbed a third of the world's emissions of carbon dioxide, one of the heat-trapping gases blamed for global warming, leading to acidification that prevents vital sea life from forming properly.¶ "The oceans are rapidly changing," Professor Stefan Rahmstorf said Thursday, on the sidelines of a U.N. conference on climate change that has drawn delegates from more than 100 countries to Kenya. "Ocean acidification is a major threat to marine organisms."¶ Fish stocks and the world's coral reefs could also be hit while acidification risks "fundamentally altering" the food chain, he said.¶ In a study titled 'The Future Oceans - Warming Up, Rising High, Turning Sour,' Rahmstorf and eight other scientists warned that we are witnessing on a global scale problems similar to the acid rain phenomenon of the 1970s and `80s.¶ The report was undertaken by the German Advisory Council on Global Change.¶ He says further research is urgently needed to assess the impact of ocean acidification.¶ David Santillo, a senior scientist at Greenpeace's Research Laboratories in Exeter, Britain, said it had come as a shock to scientists that the oceans are turning acidic because of carbon dioxide emissions.¶ "The knock on effect for humans is that some of these marine resources that we rely on may not be available in the future," the marine biologist, who was not involved in Rahmstorf's study, told The Associated Press by telephone.¶ Rahmstorf also reiterated warnings of rising sea levels caused by global warming, saying that in 70 years temperature increases will lead to more frequent storms with 200 million people threatened by floods.¶ Scientists blame the past century's one-degree rise in average global temperatures at least in part for the accumulation of carbon dioxide, methane and other gases in the atmosphere byproducts of power plants, automobiles and other fossil fuel burners.¶ "Unabated continuation of this trend will lead to a level of ocean acidification that is without precedent in the past several million years and will be irreversible for millennia," said Rahmstorf, head of Germany's Potsdam Institute for Research into Climatic Effects.¶ Africa is the continent expected to suffer most from shifting climate zones and droughts, like the one now in its fourth year in East Africa.¶ The scientist also called on industrialized nations to continue to reduce their greenhouse-gas emissions. Under the 1997 Kyoto accord, 35 industrialized countries agreed to reduce greenhouse-gas emissions by 5 percent below 1990 levels by 2012.¶ Here in Nairobi, the Kyoto countries are continuing talks on what kind of emissions targets and timetables should follow 2012.

### Environment Exts - Warming Impacts - Disease spread

#### Warming leads to disease outbreak and spread - all humanity is at risk

Khansis and Nettleman 05 (Atul and Mary, nationally-recognized experts in several areas, including epidemiologic and health outcomes research, “Global Warming and Infectious Disease”, Archives of Medical Research, p 689-696, 2005, <http://www.bvsde.paho.org/bvsacd/cd68/AKhasnis.pdf>) SWOAP

Global warming has serious implications for all aspects of human life, including infectious diseases. The effect of global warming depends on the complex interaction between the human host population and the causative infectious agent. From the human standpoint, changes in the environment may trigger human migration, causing disease patterns to shift. Crop failures and famine may reduce host resistance to infections. Disease transmission may be enhanced through the scarcity and contamination of potable water sources. Importantly, signiﬁcant economic and political stresses may damage the existing public health infrastructure, leaving mankind poorly prepared for unexpected epidemics. Global warming will certainly affect the abundance and distribution of disease vectors. Altitudes that are currently too cool to sustain vectors will become more conducive to them. Some vector populations may expand into new geographic areas, whereas others may disappear. Malaria, dengue, plague, and viruses causing encephalitic syndromes are among the many vector-borne diseases likely to be affected. Some models suggest that vector-borne diseases will become more common as the earth warms, although caution is needed in interpreting these predictions. Clearly, global warming will cause changes in the epidemiology of infectious diseases. The ability of mankind to react or adapt is dependent upon the magnitude and speed of the change. The outcome will also depend on our ability to recognize epidemics early, to contain them effectively, to provide appropriate treatment, and to commit resources to prevention and research.

#### Spread of infectious disease due to warming causes biodiversity loss and massive rates of extinction

Harvell et al. 02 (C. Drew, Department of Ecology and Evolutionary Biology, Cornell University  [Charles E. Mitchell](http://www.sciencemag.org/search?author1=Charles+E.+Mitchell&sortspec=date&submit=Submit), Department of Ecology, Evolution and Behavior, University of Minnesota, [Jessica R. Ward](http://www.sciencemag.org/search?author1=Jessica+R.+Ward&sortspec=date&submit=Submit), Department of Environmental Studies, Emory University ¶ [Sonia Altizer](http://www.sciencemag.org/search?author1=Sonia+Altizer&sortspec=date&submit=Submit), Cornell Laboratory of Ornithology, ¶ [Andrew P. Dobson](http://www.sciencemag.org/search?author1=Andrew+P.+Dobson&sortspec=date&submit=Submit), Department of Ecology and Evolutionary Biology, Princeton University¶ [Richard S. Ostfeld](http://www.sciencemag.org/search?author1=Richard+S.+Ostfeld&sortspec=date&submit=Submit), nstitute of Ecosystem Studies¶ [Michael D. Samuel](http://www.sciencemag.org/search?author1=Michael+D.+Samuel&sortspec=date&submit=Submit), U.S. Geological Survey–National Wildlife Health Center, “Climate Warming and Disease Risks for Terrestrial and Marine Biota”, Science, Vol. 296 no. 5576, 6/21/02, <http://www.sciencemag.org/content/296/5576/2158.full>) SWOAP

Infectious diseases can cause rapid population declines or species extinctions. Many pathogens of terrestrial and marine taxa are sensitive to temperature, rainfall, and humidity, creating synergisms that could affect biodiversity. Climate warming can increase pathogen development and survival rates, disease transmission, and host susceptibility. Although most host-parasite systems are predicted to experience more frequent or severe disease impacts with warming, a subset of pathogens might decline with warming, releasing hosts from disease. Recently, changes in El Niño–Southern Oscillation events have had a detectable influence on marine and terrestrial pathogens, including coral diseases, oyster pathogens, crop pathogens, Rift Valley fever, and human cholera. To improve our ability to predict epidemics in wild populations, it will be necessary to separate the independent and interactive effects of multiple climate drivers on disease impact.

#### Global warming causes widespread infectious epidemics - leads to mass death and refugee crises

Adair 12 (Kirsten, writer for Yale News, “Global warming may intensify disease”, Yale News, 4/11/12, <http://www.yaledailynews.com/news/2012/apr/11/global-warming-may-intensify-disease/>) SWOAP

The environmental changes wrought by global warming will undoubtedly result in major ecologic changes that will alter patterns and intensity of some infectious diseases,” said Gerald Friedland, professor of medicine and epidemiology and public health at the Yale School of Medicine. Global warming will likely cause major population upheavals, creating crowded slums of refugees, Friedland said. Not only do areas of high population density facilitate disease transmission, but their residents are more likely to be vulnerable to disease because of malnutrition and poverty, he said. This pattern of vulnerability holds for both tuberculosis and HIV/AIDS, increasing the incidence of both the acquisition and spread of the diseases, he explained. He said these potential effects are not surprising, since tuberculosis epidemics historically have followed major population and environmental upheavals. By contrast, global warming may increase the infection rates of mosquito-borne diseases by creating a more mosquito-friendly habitat. Warming, and the floods associated with it, are likely to increase rates of both malaria and dengue, a debilitating viral disease found in tropical areas and transmitted by mosquito bites, said Maria Diuk-Wasser, assistant professor of epidemiology at the Yale School of Public Health.

#### Climate change increases disease severity and leads to population loss and extinction

Harvell et al. 02 (C. Drew, Department of Ecology and Evolutionary Biology, Cornell University  [Charles E. Mitchell](http://www.sciencemag.org/search?author1=Charles+E.+Mitchell&sortspec=date&submit=Submit), Department of Ecology, Evolution and Behavior, University of Minnesota, [Jessica R. Ward](http://www.sciencemag.org/search?author1=Jessica+R.+Ward&sortspec=date&submit=Submit), Department of Environmental Studies, Emory University ¶ [Sonia Altizer](http://www.sciencemag.org/search?author1=Sonia+Altizer&sortspec=date&submit=Submit), Cornell Laboratory of Ornithology, ¶ [Andrew P. Dobson](http://www.sciencemag.org/search?author1=Andrew+P.+Dobson&sortspec=date&submit=Submit), Department of Ecology and Evolutionary Biology, Princeton University¶ [Richard S. Ostfeld](http://www.sciencemag.org/search?author1=Richard+S.+Ostfeld&sortspec=date&submit=Submit), nstitute of Ecosystem Studies¶ [Michael D. Samuel](http://www.sciencemag.org/search?author1=Michael+D.+Samuel&sortspec=date&submit=Submit), U.S. Geological Survey–National Wildlife Health Center, “Climate Warming and Disease Risks for Terrestrial and Marine Biota”, Science, Vol. 296 no. 5576, 6/21/02, <http://www.sciencemag.org/content/296/5576/2158.full>) SWOAP

Links between climate change and disease will increase the severity of threats associated with climate warming. Increased disease can contribute to population or species declines, especially for generalist pathogens infecting multiple host species. The greatest impacts of disease may result from a relatively small number of emergent pathogens. Epidemics caused when these infect new hosts with little resistance or tolerance may lead to population declines, such as those that followed tree pathogen invasions in North America during the last century. Although we have emphasized threats of intensified parasitism, the loss of parasites can also affect biodiversity by releasing hosts from a major source of population regulation.¶ The most detectable effects of directional climate warming on disease relate to geographic range expansion of pathogens such as Rift Valley fever, dengue, and Eastern oyster disease. Factors other than climate change—such as changes in land use, vegetation, pollution, or increase in drug-resistant strains—may underlie these range expansions. Nonetheless, the numerous mechanisms linking climate warming and disease spread support the hypothesis that climate warming is contributing to ongoing range expansions

.

### Environment Exts - Air Pollution Impact Calculus

#### Air pollution impacts comes first - policymakers should invoke the precautionary principle and vote Aff

Dreisen 2003 [David - associate professor @ Syracuse University of Law, 10 Buff. Envtl. L.J. 25, Fall/Spring] ttate

Air pollution can make life unsustainable by harming the ecosystem upon which all life depends and harming the health of both future and present generations. The Rio Declaration articulates six key principles that are relevant to air pollution. These principles can also be understood as goals, because they describe a state of affairs that is worth achieving. Agenda 21, in turn, states a program of action for realizing those goals. Between them, they aid understanding of sustainable development’s meaning for air quality. The first principle is that "human beings. . . are entitled to a healthy and productive life in harmony with nature", because they are "at the center of concerns for sustainable development." While the Rio Declaration refers to human health, its reference to life "in harmony with nature" also reflects a concern about the natural environment. 4 Since air pollution damages both human health and the environment, air quality implicates both of these concerns. Lead, carbon monoxide, particulate, tropospheric ozone, sulfur dioxide, and nitrogen oxides have historically threatened urban air quality in the United States. This review will focus upon tropospheric ozone, particulate, and carbon monoxide, because these pollutants present the most widespread of the remaining urban air problems, and did so at the time of the earth summit. 6 Tropospheric ozone refers to ozone fairly near to the ground, as opposed to stratospheric ozone high in the atmosphere. The stratospheric ozone layer protects human health and the environment from ultraviolet radiation, and its depletion causes problems. By contrast, tropospheric ozone damages human health and the environment. 8 In the United States, the pollutants causing "urban" air quality problems also affect human health and the environment well beyond urban boundaries. Yet, the health problems these pollutants present remain most acute in urban and suburban areas. 8 that have been well recognized for a long time. Ozone forms in the atmosphere from a reaction between volatile organic compounds, nitrogen oxides, and sunlight. 10 Volatile organic compounds include a large number of hazardous air pollutants. Nitrogen oxides, as discussed below, also play a role in acidifying ecosystems. Ozone damages lung tissue. It plays a role in triggering asthma attacks, sending thousands to the hospital every summer. It effects young children and people engaged in heavy exercise especially severely. Particulate pollution, or soot, consists of combinations of a wide variety of pollutants. Nitrogen oxide and sulfur dioxide contribute to formation of fine particulate, which is associated with the most serious health problems. 13 Studies link particulate to tens of thousands of annual premature deaths in the United States. Like ozone it contributes to respiratory illness, but it also seems to play a [\*29] role in triggering heart attacks among the elderly. The data suggest that fine particulate, which EPA did not regulate explicitly until recently, plays a major role in these problems. 16 Health researchers have associated carbon monoxide with various types of neurological symptoms, such as visual impairment, reduced work capacity, reduced manual dexterity, poor learning ability, and difficulty in performing complex tasks. The same pollution problems causing current urban health problems also contribute to long lasting ecological problems. Ozone harms crops and trees. These harms affect ecosystems and future generations. Similarly, particulate precursors, including nitrogen oxide and sulfur dioxide, contribute to acid rain, which is not easily reversible. To address these problems, Agenda 21 recommends the adoption of national programs to reduce health risks from air pollution, including urban air pollution. 19 These programs are to include development of "appropriate pollution control technology . . . for the introduction of environmentally sound production processes." 20 It calls for this development "on the basis of risk assessment and epidemiological research." It also recommends development of "air pollution control capacities in large cities emphasizing enforcement programs using monitoring networks as appropriate." A second principle, the precautionary principle, provides support for the first. As stated in the Rio Declaration, the precautionary principle means that "lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation" when "there are threats of serious or irreversible damage." Thus, lack of complete certainty about the adverse environmental and human health effects of air pollutants does not, by itself, provide a reason for tolerating them. Put differently, governments need to address air pollution on a precautionary basis to ensure that humans can life a healthy and productive life.

### Hegemony Exts - Status Quo not integrating airspace now

#### Status quo not integrating UAVs into our national airspace effectively now - Next Gen key to successful alignment

**JPDO 11,** (Joint Planning and Development Office, “Operating Unmanned Aircraft Systems in 2018 and Beyond: NextGen Challenges and Opportunities”, 01/04/11, AD: 07/11/12, <http://www.jpdo.gov/newsarticle.asp?id=146> | Kushal)

The integration of Unmanned Aircraft Systems (UAS) into the National Airspace System (NAS) is an integral part of the planning and implementation of the Next Generation Air Transportation System (NextGen), the multi-disciplinary effort that will offer a host of air transportation operational, technical, economic, and environmental advantages. Ultimately, NextGen will help the US achieve gains in efficiency and capacity for all users of the NAS.¶ UAS is generally defined as a system whose components include the necessary equipment, communication links, and personnel to control and employ an unmanned aircraft. The UAS is composed of six elements: the UA element, communications element, control element, support element, human element, and payload element.¶ UAS already play a unique role in the safety and security of many US military and civil missions, such as border surveillance, monitoring oil pipelines, and local law enforcement. They have evolved from simple drones and basic models to large sophisticated aircraft.¶ In 2010, UAS access to the NAS, especially for commercial operations, remains restricted due to a lack of appropriate operational procedures, standards, and policies, because the NAS is tailored to accommodate manned aircraft. UAS operate solely under Visual Flight Rules (VFR) and in segregated airspace. The Federal Aviation Administration (FAA) allows UAS operations on a case-by-case basis. They are treated as aircraft and are required to comply with current Part 91 aircraft operating rules.¶ Due to the diverse utility that UAS offer, their use will increase exponentially in a variety of key military and civil areas. Industry projections for 2018 forecast more than 15,000 UAS in service in the U.S., with a total of almost 30,000 deployed worldwide [World Unmanned Aerial Vehicle Systems, Market Profile and Forecast 2009-2010; The Teal Group]. From an operational, infrastructure, and safety perspective, this presents a number of challenges, the solutions to which will involve and impact all NAS constituencies, but ultimately enable a seamless integration of UAS into the NAS.¶ In designing NextGen and planning for a substantial increase in the use of UAS, the FAA considers the most important technical challenge to be developing a safe and efficient way that they can operate in the same airspace as crewed aircraft without creating a hazard either to other aircraft or other objects on the ground. UAS also may not have the ability to respond to Air Traffic Control (ATC)-issued instructions as quickly as manned aircraft. In addition to communications latency, there is the possibility of a total loss of communications. Although current FAA plans for the mid-term dictate that UAS will operate under Instrument Flight Rules (IFR) in Class A, B, and E airspace, plans for the long-term -- beyond 2018 -- specify that they will operate in the NAS using "electronic" IFR.

### Hegemony Exts - Airspace vulnerable to attack

#### U.S. airspace at risk of attack - detection and traffic control key

**Bolkcom 06** (Christopher Bolkcom Specialist in National Defense Foreign Affairs, Defense, and Trade Division, “Homeland Security: Defending U.S. Airspace”, 06/06/06, AD: 07/12/12, <http://www.fas.org/sgp/crs/homesec/RS21394.pdf> | Kushal)

Effectively protecting U.S. airspace requires detecting threatening aircraft and cruise missiles, making decisions on how to address these threats (called “command and control”, or C2), and negating these threats. On June 9, 2004, a small aircraft carrying the governor of Kentucky flew into restricted airspace around Washington, DC. The misidentified aircraft caused panic among Capitol Hill employees, and two F-15s were scrambled to intercept the aircraft.4 This event suggests that 2½ years after the September 11 attacks, effective defense of U.S. airspace is still in question. Surveillance. Detecting and tracking airborne threats to the United States are complicated by environment and enemy tactics. The large volume of airspace that must be surveyed presents one key environmental challenge. Airspace over the continental United States is estimated at approximately 3 million square miles.5 Enemy tactics could include flying low to the ground, which makes detection difficult, or applying stealth technology, which reduces an aircraft’s vulnerability to radar detection. As the September 11th hijackers demonstrated, turning commercial or civil aircraft into weapons is another tactic that would make threat detection difficult. Command & Control. Expediently identifying airborne threats, and accurately verifying that they are not civilian or friendly military aircraft is a key air defense challenge. The large amount of air traffic within CONUS will likely make separating “friend from foe” difficult. FAA data show that on a given day, over 80,000 distinct domestic commercial aircraft movements (e.g., departures, overflights) take place over These 80,000 aircraft movements do not include international flights, or the approximately 200,000 civil aircraft in the United States that fly some 24 million flight hours annually. Nor does this number include military aircraft that fly within both civilian and military airspace. Air defense C2 over CONUS is further complicated by the fact that decision making will not be a solely military enterprise. Civil entities such as the FAA, and the U.S. Customs Service, and military authorities will require seamless communications and hardware interoperability to make effective decisions.

#### National airspace is at risk of attack

FAS 07(“National Strategy for Aviation Security”, 03/26/07, AD: 07/11/12, <http://www.fas.org/irp/offdocs/nspd/nspd-47.pdf> | Kushal)

Threats to the Air Domain Threats to the Air Domain are numerous, complex, and adaptive. While conventional military threats in the Air Domain continue and will likely increase in times of international tension or conflict, the greatest current threat, as demonstrated in the Heathrow plot of August 2006 reminds us of the continuing danger, and therefore the focus of the Strategy, is terrorism. Globalization, technological advances, the proliferation of WMD, and the emergence of terrorism as a global phenomenon have enabled threats to the Air Domain to extend in reach, accelerate in speed, and increase in potential impact. Aviation is a global enterprise with a distributed infrastructure and multiple access points. Successful attacks in the Air Domain can inflict mass casualties and grave economic damage, and attract significant public attention because of the impact on the modern transportation system. Intelligence on threats to the Air Domain plays a critical role in assessing terrorist groups’ intentions and capabilities and requires regular update and review to ensure that Federal, State, local, and tribal governments, the private sector, and the international community are taking appropriate measures. However, even the best intelligence will not uncover every specific terrorist plot because of terrorists’ efforts at operational secrecy. Threats focused on the Air Domain can be analyzed in two ways: by originator and by targets and tactics. Threat Originators There are three main originators of threats: terrorist groups; hostile nation-states; and other criminals. Terrorist Groups. Terrorist groups are politically, as well as religiously in some cases, motivated and use premeditated violence, usually against noncombatants, to affect a particular audience. Because of their clear intent to do harm to the United States and its interests, terrorist groups remain the most severe threat to America’s security. Their ultimate goal in the Air Domain is to conduct multiple, simultaneous, catastrophic attacks exploiting the Aviation Transportation System because of its visibility as a symbol of the U.S. global presence and economic influence. In addition, the attacks of September 11, 2001, and other successful or attempted attacks have inspired emulation. The terrorist threat is changing in form and intensity as terrorists’ intentions and capabilities change and countermeasures are instituted. Their techniques are adapting on multiple fronts, including modality of planning, complexity of attack, and style of execution. The type, location, and frequency of terrorist attacks cannot be reliably extrapolated from historical patterns, and therefore current threats must be regularly reassessed. Terrorist groups, best typified by al-Qa’ida and its affiliates, pose several threats to the Air Domain. The most prominent threat is physical attack, discussed at greater length in 8 the Targets and Tactics section of the Strategy. Terrorists might also take advantage of the same tactics, techniques, and methods pioneered by criminals to counter immigration, customs, and border security measures to move people and materiel. They might deploy in regions of political and economic instability where aviation law enforcement is stretched thin or readily corruptible, bribe officials, use forged fraudulent documents, and make illegal transactions to hide their true intentions. Terrorists might use unsecured air transportation routes to transport arms, explosives, or operatives clandestinely to safe havens, training sites, or attack-staging locations. Ultimately, terrorists might use these access points and routes to transport more dangerous cargo, including WMD and their associated components. Such threats are particularly worrisome in areas where governments are weak or provide safe haven to terrorists. Hostile Nation-States. While most countries have an explicit interest in being able to operate safely, effectively, and reliably in the Air Domain, some pose threats, either due to actual hostile intent or weak infrastructure safeguards. For example, some countries directly sponsor international terrorism, providing training, funding, supplies, WMD and related components, and operational direction to surrogates. Other nation-states knowingly or unknowingly provide safe havens for terrorists who plan, prepare, or facilitate attacks or deploy materiel or operatives through the Air Domain. Some states have weak command and control over their aviation infrastructure, such as their internal air defenses or airport security apparatus, which terrorists can then exploit. Additionally, nation-states could present a military threat, such as cruise missiles, to the United States and U.S. interests globally in the Air Domain. Criminals. Criminals, including individuals and groups, use the Air Domain to pursue objectives that are illegal under U.S. law or international convention. Domestic extremists in the United States have not, to date, engaged in organized efforts to attack the Aviation Transportation System. However, there are potentially violent domestic groups and individuals who have extensive knowledge of the aviation sector coupled with a demonstrated expertise in manufacturing and employing targeted-attack techniques, including improvised or conventional explosive devices.

#### Only NextGen can successfully integrate UAV systems into civilian airspace

Defense Update 09 (Online Defense Magazine, “Operating UAVs in Crowded, Integrated Airspace”, 2009, AD: 07/10/12, <http://defense-update.com/features/2009/july/uav_in_civil_airspace_040709.html> | Kushal)

 “UAVs will soon fly with manned aircraft in commercial airspace” says avid Vos, Senior Director Control Technologies at Rockwell Collins.¶ “The growing demand for unmanned systems among military and government users is motivating the industry and government to find the ways to integrate manned and unmanned assets to operate safely in a common airspace” Vos added. UAV operations have grown in this decade from 167 systems operated by the military in 2001 only 167 UAVs operated mainly by the military and government in 2001 to 5,500 flying today. “Today, many UAVs are already flying in an airspace crowded by manned aircraft. ”Vos noted. An example for such integration is the airspace around Balad airbase in Iraq, where military helicopters, fixed wing military aircraft, commercial passenger aircraft, FedEx and UPS cargo planes are flying alongside unmanned aircraft, such as the Global Hawk, Predator and Hunter UAVs, performing 20-30 daily sorties from the airbase.¶ ¶ Although integration of UAVs in Civil Controlled Airspace is not yet cleared in standard regulations, unmanned aircraft are already supporting civilian emergency operations as well. In recent years UAVs were flying missions inside civilian airspace in the USA, monitoring disaster areas and emergency operations along the Red River flood area in North Dakota, surveying hurricane damage along the Gulf of Mexico, spotting fires in the Southern California mountains, surveying the Arctic and assisting police operations on a pilot test program in Los Angeles.¶ ¶ Vos was the founder of Athena Technologies acquired by Rockwell Collins last year. “Compared to the early unmanned systems, which hade limited situational awareness and poor safety record, today’s aerial vehicles are designed with high level of redundancy – dual, triplex and even quad redundant systems are currently available” Vos said. In addition, aviation certified engines, advanced, affordable integrated avionics that can offer automated takeoff, landing and mission control. “Automatic landing provides an essential element to another safety feature – a ‘Panic Button Emergency Landing’ enabling operators to safely abort a mission over populated area, without risk to the surrounding area” Noted Vos. After being implemented and proven in UAVs, Vos expects such essential capability could be introduced back into manned aircraft, to improve flight safety and avoid collateral damage on the ground, in case of emergency. Other elements contributing to UAV flight safety are advanced sensors offering better situational awareness; in the near future, structure damage fault tolerance will become reality, enabling a UAV to recover from bird strikes and in-flight failures.¶ ¶ According to Vos, once UAVs can automatically takeoff, land and perform emergency procedures enabling them to safely fly in civil airspace, their integration into the Air Traffic Management (ATM) system is required. While future NextGen ATM will support such integration, the platforms should have the means to maintain situational awareness, adherence to flight control, rules and procedures and is key to maintain flight safety. These capabilities can be supported today in the larger platforms, that have enough space and power capacity to operate communications, datalinks, IFF and 4D navigational equipment, as well as built-in capabilities to perform collision avoidance, due regard and weather radar.

### Hegemony Exts - Plan leads to more civilian/defense collaboration

#### Next Gen technology is supported by our defense systems - it allows our civilian airspace to align with military planning - key to homeland security

Lincoln Lab 12 (Massachusetts Institute of Technology, Technical Divisions, “Homeland Protection and Air Traffic Control — Division 4”, 2012, AD: 07/10/12, <http://www.ll.mit.edu/employment/division4.html> | Kushal)

The Homeland Protection and Air Traffic Control Division leads MIT Lincoln Laboratory's efforts in these mission areas. Under Homeland Protection, the division focuses on systems and technology for chemical and biological defense; maritime, border, and airspace security; and disaster response. The division's Air Traffic Control programs support the Federal Aviation Administration's (FAA) Next Generation Air Traffic Control System initiative in developing a national GPS-based surveillance system, airborne and ground-based collision avoidance technologies, advanced weather forecasting and associated decision support tools, and future air traffic control tower automation.¶ Recent and planned accomplishments include¶ Operation and refinement of the Enhanced Regional Situation Awareness system for air defense of the National Capital Region¶ Development and prototyping of architectures and technologies to improve multiagency collaborative command during disasters such as wildfires, earthquakes, or floods¶ Testing of a system to protect subway passengers in a major metropolitan region from biological attacks¶ Deployment and testing of automation and safety lights for preventing runway incursions at Boston's Logan International Airport¶ Development of an eight-hour automated thunderstorm forecast for use in air traffic management facilities¶ The division's most important asset is its innovative workforce with expertise across technologies including radar, optical, acoustic, and biological sensing; large software system development; weather forecasting; decision support; and systems analysis and modeling.¶ Groups¶ Group 42—Surveillance Systems¶ Group 43—Weather Sensing¶ Group 46—Homeland Protection Systems¶ Group 47—Chemical and Biological Defense Systems¶ Group 48—Bioengineering Systems and Technologies¶ Group 42—Surveillance Systems¶ The Surveillance Systems Group develops integrated sensing and decision support systems for both Air Traffic Control and Homeland Protection. Current programs focus on new sensor, data fusion, and net-centric systems addressing both the air traffic mission of improving capacity, safety, and security within the U.S. airspace, spanning air, land, and maritime domains, and the Homeland Protection areas of disaster response and biodefense. Key accomplishments include the Traffic Alert and Collision Avoidance System; the Enhanced Regional Situation Awareness system, which improves the identification and response to airborne threats in the National Capital Region; Runway Status Lights, which improve the safety of taxiing aircraft at major airports; and the Lincoln Distributed Disaster Response System, which enables multiagency collaborative command and control for large-scale disasters. The group works all phases of the solution to a problem from original concept development through development of operational prototypes. To accomplish these goals, the group employs a broad base of technical talent including systems analysis, software architecture and development, radio frequency and digital hardware design, and system integration.¶ Group 43—Weather Sensing ¶ The Weather Sensing Group develops sensors, automated forecasting systems, and decision support systems to reduce the impact of adverse weather and traffic constraints on commercial aviation. The group combines Lincoln Laboratory expertise in sensor processing, meteorology, analysis, and advanced algorithms, tied together by a solid core of software architecture development. Extensive field evaluations and simulation studies are employed to ensure user acceptance and the successful transition of new technologies into operational use. Key accomplishments include the development of the Terminal Doppler Weather Radar and ASR-9 Weather Systems Processor, and deployment of decision support systems—including the Integrated Terminal Weather System, Corridor Integrated Weather System, Route Availability Planning Tool, and prototype Tower Flight Data Manager—at numerous facilities in the United States.¶ Group 46—Homeland Protection Systems¶ The Homeland Protection Systems Group develops system architectures, conducts technology assessments, and performs risk-reduction demonstrations addressing future capabilities for homeland protection. Current programs focus on disaster response, maritime and land border surveillance and interdiction, chemical/biological defense, and infrastructure protection (for example, airport and special event security). These activities require modeling, simulation, field measurements, and demonstrations to assess the ability of emerging technologies and architectures to meet mission requirements. This work often involves direct interaction with operational partners in the Department of Homeland Security, state and local authorities, and Department of Defense. Staff in the group maintain expertise across a broad range of technologies, including radar, optical, acoustic, biological, and chemical sensing. In addition, researchers synthesize these technology areas into innovative architectural concepts to assist in defining next-generation capabilities.¶ Group 47—Chemical and Biological Defense Systems ¶ The Chemical and Biological Defense Systems Group develops systems and technology for disaster preparedness, detection, mitigation, and attribution, with emphasis on chemical and biological defense. Principal sponsors are the Department of Homeland Security and the Department of Defense. The work of the group is highly interdisciplinary; as a result, the backgrounds of the researchers are diverse, including engineering (electrical, mechanical, chemical, biomedical), physics, mathematics, computer science, chemistry, and biology. Rigorous systems analyses produce system architectures and recommend research areas to guide government investment. These analyses are grounded by modeling and simulation of threats and defenses, and by data analysis. Sensor development is conducted at several levels, including initial measurements of detection signatures, proof-of-concept experiments for biological or chemical assay or electro-optic sensors, integration into autonomous sensors along with development of the associated electronics and algorithms, and rigorous field testing in relevant environments. The group develops and tests multitechnology integrated systems in operational settings. The integrated systems include significant algorithm development to fuse multisource information. Emerging thrusts in the group include support for additional Homeland Security missions, natural disaster management, forensics, and electronics and algorithm support for other Lincoln Laboratory missions.¶ Group 48—Bioengineering Systems and Technologies¶ The Bioengineering Systems and Technologies Group seeks to improve the performance of human-centered missions through preventing injury and disease, improving sensing and identification of people and their environment, and speeding rehabilitation and recovery. This goal is accomplished through four broad technical areas: biomedical research, synthetic biology, bioinformatics and biometrics, and forensics. Biomedical research includes advanced sensing, algorithms, modeling, prototyping, and field testing of technologies to diagnose disease, predict outcomes, avoid injuries, and monitor and enhance human performance. The synthetic biology research is developing tools and techniques that will greatly speed the design, evaluation, and assessment of genome-wide engineering approaches through highly integrated microfluidic devices. Bioinformatics is applied across the group to uncover signatures in high-throughput genomic, transcriptomic, and proteomic data sets. Biometrics and forensics research is developing technologies and systems for human identification, including rapid DNA analysis, standoff biometric sensing, scientific validation of forensic techniques, and integrated architecture analyses. This highly interdisciplinary group draws on skills from biology, biochemistry, biosignal processing, engineering, computer science, physics, and medical research areas. Primary government sponsors are in the Departments of Defense, Homeland Security, and Justice, as well as the National Institutes of Health.

#### NextGen leads to more collaboration with our defense systems - allows for more efficient and more secure use of the skies

Joint Planning and Development Office 07 (“Concept of Operations for the Next Generation Air Transportation System”, 02/28/07, AD: 07/09/12, <http://www.jpdo.gov/library/nextgenconopsv12.pdf> | Kushal)

2.3.3 Collaboration on Airport Operations and Planning Significant collaboration occurs in the NextGen among the ANSP, flight operators, and airport operators regarding ground operations and planned improvements for airports. [R-14] The ANSP plays a greater role in the NextGen timeframe in supporting regional system planning and addressing airspace interactions among air traffic flows to and from airports and the potential distribution of traffic among a regional system of airports, as described in Chapter 3. Collaboration on Airspace Operations for Security and Defense Needs Use of airspace involves collaboration among the ANSP, flight operators, defense services providers, and security services providers. The overall goal for airspace collaboration is to minimize disruption of air traffic while recognizing national defense needs to train pilots and protect the security of sensitive assets, significant activities, and critical infrastructure. Defense and homeland security airspace restrictions are dynamically managed to enhance airspace access. Restrictions for accessing airspace are based on risk and managed flexibly to accommodate security and defense needs in a nondisruptive manner. For security and defense uses of airspace, blanket restrictions as a default strategy are no longer used to address security needs. Instead, management of security and defense needs is based on flight-specific access requirements, where practical (also see Section 6.4.5 on secure airspace concepts). Flight operators receive this information so they can better plan flights and be aware of likely restrictions. [R-15]

#### Next Gen bridges cooperation between the DOD, FAA, and DHS - increases airpsace security

Bolczak and Fong 08(ICNS Conference, “Shared situational awareness to meet future airspace security mission needs”, 2008, AD: 07/10/12, <http://www.researchgate.net/publication/4346992_Shared_situational_awareness_to_meet_future_airspace_security_mission_needs> | Kushal)

Airspace security is a mission that is shared by the Federal Aviation Administration (FAA), Department of Defense (DoD), Department of Homeland Security (DHS), and National Airspace System (NAS) users among others including civil airspace users. Because events can unfold rapidly in the air domain, Shared Situational Awareness among the players is needed to facilitate rapid decision-making that can have life-or-death consequences. The current airspace security operation relies heavily on telephonic coordination with limited shared situational awareness, and treats potential threats in a "one-size-fits-all" manner, rather than focusing on highest risk. The future vision is the Next Generation Air Transportation system (NextGen) Secure Airspace concept, which is part of a multi-layered, adaptive security service that is risk-informed, is integrated into trajectory- based operations, and operates in a net-enabled environment. This paper describes the airspace security mission, the future concept, mission partner perspectives for information sharing, and challenges and opportunities in improving shared situational awareness.

### Hegemony Exts - NextGen key to securitizing airspace

#### Next Gen coordination with DHS activities key securing US airspace

Dillingham 10 (Statement of Gerald L. Dillingham, Ph.D.¶ Director, Physical Infrastructure Issues, “NEXT GENERATION AIR TRANSPORTATION SYSTEM¶ Challenges with Partner Agency and FAA Coordination Continue, and Efforts to Integrate Near-, Mid-, and Long-term Activities Are Ongoing”, 4/21/10, AD: 07/10/12, <http://www.gao.gov/new.items/d10649t.pdf> | Kushal)

Limited funding and staffing to dedicate to NextGen activities. Industry stakeholders and agency officials we spoke to stated that some partner agencies’ ability to coordinate with other agencies was affected by the levels of funding and staff that could be dedicated to NextGen activities. Officials at some partner agencies we spoke with stated that partner agencies allocated little or no budgetary funding specifically for NextGen activities and because of competing priorities for funds, they were limited in the resources they could dedicate to NextGen planning and coordination efforts. With respect to future investments, according to JPDO and DOT data, in fiscal year 2011, among NextGen partner agencies, three—FAA, NASA, and the Department of Commerce’s NOAA—requested some funding for NextGen activities. DOD and DHS did not request funding in their budgets specifically for NextGen activities. OSTP is working with the Office of Management and Budget to improve agency alignment and identification of NextGen-related budgets.¶ •¶ Differences in agency mission. Differences among agencies’ mission priorities, particularly DHS’s and DOD’s, also pose a challenge to coordination efforts. DHS’s diverse set of mission priorities, ranging from aviation security to border protection, affects its level of involvement in NextGen activities. For example, events such as the 2009 Christmas Day terrorism attempt can shift DHS priorities quickly and move the agency away from focusing on issues such as NextGen, which are not as critical at that particular time. Agency officials also stated that although different departments within DHS are involved in related NextGen activities, such as security issues, the fact that NextGen implementation is not a formalized mission in DHS can affect DHS’s level of participation in NextGen activities. Industry stakeholders told us that there are potential¶ consequences if DHS is not involved in long-term NextGen planning, including potentially marginalizing DHS’s NextGen areas, such as aviation security. Industry stakeholders reported that FAA could more effectively engage partner agencies in long-term planning by aligning implementation activities to agency mission priorities and by obtaining agency buy-in for actions required to transform the national airspace system.¶ •¶ Undefined near-term roles and responsibilities of partner agencies. Some stakeholders and agency officials told us that FAA could do more to clearly define each partner agency’s role in key planning documents that guide NextGen implementation efforts, particularly in the near term. Our work has shown that coordinating agencies should work together to define and agree on their respective roles and responsibilities, including how the coordination effort will be led.11 We reported in 2008 that a key intended purpose of these planning documents, according to JPDO officials, is to provide the means for coordinating among the partner agencies and to identify each agency’s role in implementing NextGen capabilities, but that stakeholders said that the planning documents did not provide guidance for their organizational decision making.12 Some stakeholders and agency officials we spoke to more recently told us that the NextGen Implementation Plan, which identifies near- and midterm implementation efforts, still does not specify how partner agencies will be involved or what outcomes are required from them. Another industry stakeholder explained that if partner agencies do not see their roles reflected in key planning documents, projects which depend on inter-agency coordination will not be fully integrated across all partner agencies. One area in particular where coordination is important is related to how FAA, DOD, and DHS information networks will share information in the future to allow for a shared awareness of the national airspace. Information sharing across agencies is necessary for such things as advanced capabilities related to optimizing the use of certain airspace by the diverse set of users under the auspices of these agencies (e.g. military aircraft, commercial aircraft, general aviation, unmanned aerial vehicles, etc.). Protocols and requirements for inter-agency information sharing have yet to be determined. Limited agency participation in near-term coordination efforts, including establishing protocols on information sharing across agencies, could hamper coordination over the long term.

### Hegemony Exts - Securing NAS good

#### Security of national airspace key to deterrence

**SIRRA 05** (Sustainable Installations Regional Resource Assessment, “Proximity to Military Training Routes, Fighter Range”, 2005, AD: 07/13/13, <http://datacenter.leamgroup.com/sirra/indicator-tabular-data/airspace/mtrf.html> | Kushal)

National security depends largely on the deterrent effect of our airborne military forces. To be proficient, the military services must train in a wide range of airborne tactics. One phase of this training involves "low level" combat tactics. The required maneuvers and high speeds are such that they may occasionally make the avoid aspect of flight more difficult without increased vigilance in areas containing such operations. In an effort to ensure the greatest practical level of safety for all flight operations, the Military Training Route (MTR) was conceived. The MTR program is a joint venture by the Federal Aviation Administration and the Department of Defense. MTRs are mutually developed for use by the military for the purpose of conducting low-altitude, high-speed training. Generally, MTRs are established below 10,000 feet (mean sea level) for operations at speeds in excess of 250 knots (Air Force, 2005). However, route segments may be defined at higher altitudes for purposes of route continuity. For example, route segments may be defined for descent, climb-out, and mountainous terrain. This indicator provides a measurement of MTR airspace available to fighter aircraft. Availability is measured by the aircrafts un-refueling range as defined by the U.S. Air Force (Air Force, 2005). Having available airspace is typically a necessity for military training. Inadequate access is a strong indicator of limitations on military development and missions. This would then place the military installation in a vulnerable state, affecting the type and intensity of training that could take place on the installation. It is important to note that although this indicator describes availability of fighter aircraft MTRs, not all installations make use of training airspace. Ideally, installations are prepared for transformations to any mission. However, it may not be realistic. It is important to use local knowledge of an installation’s current and future mission requirements when interpreting this indicator. Replicable: This indicator could be replicated annually based on information updated in the DAFIF System (DAFIF, 2005).

### Hegemony Exts - UAVs good

#### Drones are a technological necessity for modern-day effective warfighting - key to fighting WOT, mapping weather and satellite imaging - Next Gen key to effective airspace coordination

**Aluise 12** (Susan J. Aluise is president and executive editor of National News Syndicate, “Big Bang to Big Bucks: Drones Are Coming to a Sky Near You”, 2/28/12, AD: 07/10/12, <http://www.investorplace.com/2012/02/drones-coming-to-a-sky-near-you-avav-noc-txt-ba-baesy-rtn/> | Kushal)

Unmanned aerial vehicles (UAVs) have been the tech stars in the wars in Afghanistan and Iraq — as well as in the more amorphous War on Terror. But with final combat operations in Afghanistan scheduled to end in December 2014, manufacturers of UAVs (also called drones) are looking toward their next market opportunity: commercial applications here at home.¶ Congress and President Barack Obama gave the nascent commercial drone industry a shot in the arm earlier this month, ordering the Federal Aviation Administration to craft a plan to open up U.S. airspace to thousands of unmanned drone aircraft by 2015. The new mandate was part of the agency’s $64.4 billion funding bill, which includes money for its fuel- and time-saving NextGen air traffic control system. Now the FAA will need to safely work drones into the national airspace mix as well.¶ The law requires the FAA to permit police, firefighters and other first responders to launch their own UAVs within 90 days — as long as the drones fly above 400 feet and don’t weigh more than 4.4 pounds. By next year, the weight limit rises to 55 pounds. The agency has an aggressive timetable in which to develop safety regulations and specify technical requirements.¶ Why the big push for putting these unmanned drones into U.S. airspace? Simple — it’s big business. The applications appear endless for these pilot-less aircraft — which range in size from AeroVironment’s (NASDAQ:AVAV) 3-inch-long Nano Air Vehicle to Northrop Grumman’s (NYSE:NOC) RQ-4 Global Hawk, whose 116-foot wingspan is larger than that of an Airbus A320.¶ Drones can be used for everything from to border control to law enforcement surveillance to infrared heat detection for firefighters. They also can be used for mapping, remote monitoring of oil fields and industrial sites or for agricultural and weather applications. Advocates say the commercial applications of the technology are limitless.¶ Of course, those applications also could include shooting video through windows of private homes and streaming it to YouTube or setting up cheap, 24/7 surveillance of celebrities. A coalition of privacy groups including the American Civil Liberties Union, the Electronic Privacy Information Center and Consumer Watchdog last week sent a letter to Acting FAA Administrator Michael Huerta urging him to make privacy concerns paramount in the agency’s rule-making process.¶ “The increased use of drones poses an ongoing threat to every person residing within the United States,” the privacy advocates said. “Private detectives are starting to use drones to track their targets. Google (NASDAQ:GOOG) has deployed street drones in other countries to supplement the images of StreetView. Criminals and others may use drones for purposes of stalking and harassment.”¶ Safety issues are perhaps a greater concern in drone operation, since even the most high-end aircraft with the most skilled operators have been known to crash or collide with other aircraft. A U.S. drone crashed in northwest Pakistan on Saturday, apparently because of a technical problem.¶ And last year, one of Textron (NYSE:TXT) subsidiary AAI’s RQ-7 Shadow drones collided with a U.S. Air Force C-130 transport in midair over Afghanistan. Although the transport plane landed safely, it sustained significant damage to the wing — including a ruptured fuel tank.¶ Still, this is a huge business opportunity for UAV manufacturers to find new commercial business. And many so-called “dual use” technologies were born military and developed wildly lucrative commercial business applications — two examples being nuclear technology and GPS.¶ Looking at the commercialization of drones from an investment perspective, here are a few key companies that could benefit if the market soars as high as some advocates believe:¶ Boeing’s (NYSE:BA) Insitu subsidiary develops the ScanEagle and NightEagle drones.¶ Northrop Grumman has an extensive family of drone aircraft including the Global Hawk, Firebee, Bat and Hunter.¶ BAE Systems (PINK:BAESY) offers the “flapless” Demon drone.¶ Textron’s AAI subsidiary produces commercial UAVs that include the Shadow family as well as Aerosonde and Orbiter.¶ AeroVironment’s commercial UAVs include the Wasp, Raven and Global Observer lines.¶ Schiebel Technology is privately held and produces the Camcopter UAV, a rotorcraft that can deliver a wide range of video applications.¶ General Atomics Aeronautical Systems is privately held and best known for the Predator and Grey Eagle families.¶ Raytheon‘s (NYSE:RTN) Missile Systems has developed the stealthy Killer Bee drone.¶ Bottom Line: Although privacy is a rallying cry for many, individuals have virtually no privacy rights today when it comes to being photographed outside. Manufacturers and users will argue — likely successfully — that the drones pose no greater threat than traffic cameras or security cameras at stores and ATMs. Photographing individuals inside their own homes might be a bit of a sticky wicket for commercial drone advocates, however.¶ Still, the FAA will have to walk a tightrope if it is to permit widespread, yet safe, operation of vast numbers of commercial drones of all types in the national airspace. Expect the FAA to issue tight restrictions on operations near airports, to require advanced onboard sensors that can steer the drones away from aircraft and perhaps even require operators’ licenses. Expect the Department of Homeland Security, the FBI and other agencies to keep a close eye on the potential for diversion of drones by potential terrorists.

#### UAVs key to solve terrorism

**Cooper 12** (Rich, staff writer for Defense Media Network, “Droning On Around Us”, 06/09/12, AD: 07/12/12, <http://www.defensemedianetwork.com/stories/droning-on-around-us/> | Kushal)

Look, up in the sky … It’s a bird! It’s a plane. It’s a … drone?¶ While those are not words we are ultimately familiar with, they are words we may very well be saying in the coming days in the skies above the United States. While model airplane enthusiasts have long enjoyed flying small remote controlled aircraft around open fields and skies for their own enjoyment, advancements in technology have made what was once seen as a hobby into a very real issue of surveillance and civil liberties.¶ Today drones, or unmanned aerial vehicles (UAVs) are the tip of the spear in the U.S. arsenal taking out al Qaeda leaders and other bad guys around the world. The recent take down of Al Qaeda’s number 2 guy, Abu Yahya al-Libi in northern Pakistan is just another example of the extensive use of these tools since the wars in Afghanistan and Iraq began more than a decade ago.¶ When the United States first went into Afghanistan following the September 11 attacks, the American public got its first widescale public exposure to the use and effectiveness of the Predator. Made by General Atomics, the Predator is a UAV capable of not only staying aloft for extended periods of time and beaming back live images of the targeted area below, but delivering one or two Hellfire missiles to extinguish whatever its ground controllers no longer want walking the face of the Earth.¶ The use of the Predator and other UAVs has not only allowed the wars in Afghanistan and Iraq to be effectively prosecuted, but has saved the lives of American and Allied forces while exterminating people we are better off without. Controlled by remote pilots, often in areas far from the actual battlefields, these tools have put eyes, ears and weapons in places formerly out of reach.¶ So if they are so good at keeping an eye on what is happening around a given area, what would the harm be if we had UAVs flying around the United States? That question, and the response by Virginia Governor Bob McDonnell, has ignited a debate about the use of these technologies on, or over, American soil.¶ What may give comfort to American citizens in protecting its men and women in uniform and taking out bad guys on a far off battlefield does not necessarily provide much comfort to some people if it flies overhead here in the US.

#### Drones are the backbone of our modern-day warfighting - they are cost-effective, precise, and safer

**Dilegge 12** (David Dilegge is a retired USMCR Intelligence and Counterintelligence/HUMINT office, “Drones Revolutionize US Warfare”, 06/11/12, AD: 07/10/12, <http://smallwarsjournal.com/blog/drones-revolutionize-us-warfare> | Kushal)

They are robots in the sky and some say they are revolutionizing the way the United States wages wars. Drones are playing a growing role in the U.S. military.¶ It is estimated that there are 10,000 unmanned aerial vehicles in the U.S. military's arsenal, in addition to an undisclosed number operated by the CIA - including one that recently killed Abu Yahya al-Libi, al-Qaida's number two leader. ¶ Pakistan objects to the use of drones over its territory. But U.S. Defense Secretary Leon Panetta has given no indication Washington will stop using them against terrorists.¶ "We made it clear to the Pakistanis that United States of America is going to defend ourselves against those that would attack us, and we have done just that, we have gone after their leadership and we have done it effectively," said Panetta.¶ Drones are relatively cheap to operate. Their strikes are precise. And they entail no risk to the pilots who operate them from U.S. bases thousands of kilometers away. ¶ At a time of shrinking budgets and growing war fatigue among the American public, the Obama administration has made unmanned aerial vehicles a central component of its new defense strategy.¶ Michele Flournoy is a former top Pentagon official and an architect of that strategy.¶ "The whole realm of unmanned systems is going to revolutionize the force over time," said Flournoy. "We are still in the process of understanding what those systems bring in terms of new ways of operating, new ways of working as a military."¶ By some accounts, that revolution is happening now. UAVs' effectiveness and their small footprint are quickly making them the Obama administration's weapon of choice for U.S. military and intelligence operations.¶ John Brennan is President Obama's chief counterterrorism adviser:¶ "It is hard to imagine a tool that can better minimize the risk to civilians than remotely piloted aircraft," Brennan said.¶ But anti-drone protesters say drones are not risk free and the deaths of bystanders in Pakistan and elsewhere go largely unreported.¶ Medea Benjamin fears that Americans could become desensitized to war.¶ ¶ "The biggest ethical problem with drones is that it makes killing too easy," said Benjamin.¶ For U.S. leaders, armed drones have proven their worth and are the way of the future. Activists want a moratorium until laws catch up with the technology in order to keep it in check.

### Hegemony Exts - Plan sparks global leadership

#### NextGen promotes U.S. leadership in global aviation

**JPDO 10** (Joint Planning and Development Office, “Next Generation Air Transportation System International Strategy”, 01/07/10, 07/13/13, <http://www.jpdo.gov/library/InformationPapers/JPDO_International%20Strategy.pdf> | Kushal)

To be successful, ICAO member States will need to collectively support the efforts of global harmonization, and many States will look to the U.S. for leadership in the area of NextGen technologies. Traditional and virtual communities are vehicles to share U.S. concepts and promote U.S. technologies with international partners. Fostering avenues for knowledge sharing within the international aviation commnity will provide a work environment where stakeholders can collectively reflect and create knowledge, and more readily harmonize worldwide equipage and procedural standards. The JPDO partner agencies and members of industry have ample opportunities to promote NextGen globally at agency and industry supported venues. The U.S. must leverage these opportunities with International Strategy Joint Planning and Development Office n JPDO Paper n [www.jpdo.gov](http://www.jpdo.gov) a focus towards promoting NextGen worldwide. Readily available communications media for NextGen, such as written briefings and graphic presentations, will be required and should be customized for various international audiences. To ensure agency representatives deliver a consistent message, a library of briefings and handouts will be developed. In addition, the U.S. will work with international partners on technical training in NextGen technologies and procedures through appropriate channels.

#### NextGen key to U.S. leadership

**Bourgeois 10** (Daniel Bourgeois, August 2010, Masters of Science, Science Technology and Public Policy, Rochester Institute of Technology, “The Next Generation Air Transportation System: An Answer to Solve Airport Efficiency?”, 2010, AD: 07/12/12, <http://gradworks.umi.com/1480274.pdf> | Kushal)

There are six objectives that the JPDO set forth to accomplish. They are to retain the United State’s leadership in aviation, expand the capability of the current air system, ensure safety is still in place, protect the environment, ensure national security, and ensure that the system itself is secure. In 2005 the JPDO set out on this task by developing a high level vision to communicate the principles to all of the related agencies. The most difficult part about NextGen is its scope and breath. NextGen encompasses all of the aerospace transportation industry, not just aviation or air traffic management or (ATM). Working with these multiple agencies is critical in getting the goals of NextGen accomplished. After meeting with these agencies the JPDO came out with a NextGen vision briefing. The NextGen vision briefing document details eight different capabilities the new system must have in order to accomplish the six goals that were set for the system.

### Hegemony Exts - Integration of national airspace --> more UAVs

#### Status quo not integrating UAVs successfully into our national airspace now - Next Gen key to integration and allows for expansion of UAV operations

**JPDO 12** (Joint Planning and Development Office, “Unmanned Aircraft Systems¶ Research, Development and Demonstration Roadmap”, 3/15/12, AD: 07/11/12, <http://www.jpdo.gov/library/20120315_UAS%20RDandD%20Roadmap.pdf> | Kushal)

This is the first report of progress in producing a NextGen Unmanned Aircraft Systems Research, Development and Demonstration Roadmap (NextGen UAS RD&D Roadmap). The activity was established to enable a responsive, efficient, timely, coordinated multiagency Research and Development (R&D) effort that will enable the U.S. to realize fully the benefits of Unmanned Aircraft Systems (UAS) in the National Airspace System (NAS).¶ The use of UAS dates from the earliest days of flight. UAS today play an increasing role in many public missions such as border surveillance, wildlife surveys, military training, weather monitoring, and local law enforcement. However, expansion of domestic UAS operations has been inhibited by lack of a common understanding of what is required to safely and routinely operate UAS in the NAS. Challenges such as the lack of an onboard pilot to see and avoid other aircraft and the wide variation in unmanned aircraft missions and capabilities must be addressed in order to fully integrate UAS operations in the NAS in the NextGen timeframe.¶ This report represents a significant effort on the part of the Next Generation Air Transportation System (NextGen) partner agencies to establish a multiagency roadmap of the R&D necessary to enable routine operations of UAS in the NextGen NAS. This initial report is intended to accomplish the following objectives:¶ • Document an initial set of critical R&D challenges that need to be addressed to enable routine access for UAS in the NextGen NAS¶ • Develop an approach to linking the R&D activities of the partner agencies with the R&D needs of the FAA to support integration of UAS in the NAS¶ • Establish an approach to coordinating R&D activities of the participating agencies in order to address those challenges¶ • Identify relevant ongoing and planned R&D projects to serve as a baseline for the NextGen UAS RD&D Roadmap1¶ • Set forth a series of next steps toward achieving a responsive, vetted roadmap, monitoring progress, and identifying actions needed¶ The Office of Management and Budget recently tasked the NextGen partner agencies to develop a strategic, multiagency, NextGen UAS RD&D Roadmap with facilitation and assistance from the Joint Planning and Development Office (JPDO). The primary objective was to identify the most critical technology issues involved in establishing a plan for UAS operations. The results are contained in this document, which will serve as a baseline for further development of the Roadmap.¶ The roadmapping activity is intended to assist the FAA in identifying and providing information needed to enable routine UAS access in the NextGen NAS. The Roadmap will also assist the R&D performers in the partner agencies to share information, enabling the agencies to make faster progress in addressing the critical R&D challenges; to capitalize on the research¶

### Hegemony Exts - Aviation Industry key to Hegemony

#### Aviation industry key to hegemony

SpaceRef 02( Commission on the Future of the United States Aerospace Industry, “Commission Study Shows Ecomomic Importance of U.S. Aerospace and Aviation Industry at the National, State, and Local Levels”, 10/31/02, AD: 07/09/12, <http://www.spaceref.com/news/viewpr.html?pid=9708> | Kushal)

WASHINGTON- According to a report released today the Commission on the Future of the U.S. Aerospace Industry, the U.S. civil and commercial aerospace and aviation industry employed more than two million workers in 2001, with an annual average wage of $47,700. The industry has a major economic and employment impact in all 50 states and is a substantial force in civil, military, and space manufacturing and operations in nearly half of the nation's states. The statistics are revealed in an extensive national and state-by-state analysis of the aerospace and aviation industry released here today by the Commission on the Future of the U.S. Aerospace Industry, a 12-member panel formed in 2001 by President George W. Bush and the U.S, Congress. The industry statistical study - U.S. Aerospace and Aviation Industry: A State-by-State Analysis - examines the industry by direct employment, wages, establishments, and payroll. The 112-page report provides government officials, industry leaders, academicians, and others with objective, comparative economic data about the industry in today's national and global economy. In releasing the report, Commission Chairman Robert S. Walker noted that "A strong aerospace industry is essential to enable the United States to defend itself, compete in the global marketplace, maintain a highly skilled workforce, and provide all Americans with the ability to travel safely and securely anywhere in the world." Walker further explained, "The data will assist policymakers and the public in understanding the economic stakes at hand as the commercial aerospace industry faces the challenges of market forces, homeland security, and foreign competition. The state-by-state report shows that the air transportation segment of the aerospace and aviation industry was the leading employer with more than 1.3 million jobs in 2001. Air transportation workers earned an average of $40,600 per year. The leading centers of aviation employment were California, Texas, Illinois, Florida and New York. The study also shows that aircraft and parts manufacturing employed some 462,200 workers, with an average annual salary of $57,200. The leading centers of aircraft and parts manufacturing by state in 2001 were Washington, California, Kansas, Texas, and Connecticut. Other data breakouts by sector include Guided Missile Manufacturing, Satellite Communications, Space Research and Technology, and Search and Detection Manufacturing. "The significance of our analysis," Walker explained, "lies in the illustration of the importance of the aerospace and aviation industry to the economic health of every state economy. California, Texas and Washington lead by most aerospace and aviation metrics. At the same time, however, the report demonstrates that Alabama, Arizona, Georgia and Kansas are home to strong industry clusters - a fact some may find surprising." The statistical data in this study also include pertinent aerospace and aviation workforce and economic impact data for leading U.S. metropolitan areas, including Seattle, Los Angeles, Dallas/Ft. Worth, Phoenix, Boston, Atlanta, New York, Wichita, and Chicago. Statistics used in the report are based on the most recently available U.S. government data from the Bureau of Labor Statistics and are limited by the Standard Industrial Classification system. The study does not measure the additional jobs generated by aerospace and aviation in states and localities. For example, workers in food service, security, and fire service jobs at airports or NASA centers are not included. While the analysis includes military suppliers, it does not include military workers at facilities such as U.S. Air Force and U.S. Navy aviation bases. "Those jobs, however, are a vital part of our economy and our defense structure and are dependent on the existence of the U.S. aerospace industry," Walker remarked. While the figures provided by the government are the latest official data, they don't reflect the significant downturn of the industry since the terrorist acts of September 11, 2001. Since then, the industry has experienced a serious decline. The statistical data was collected and compiled by Content First, a Washington, D.C-based. research and information services firm. The Commission on the Future of the United States Aerospace Industry is a congressionally mandated commission, as established in Section 1092 of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001, Public Law 106-398. The Commission was formed to study the future of the United States aerospace industry in the global economy, particularly in relationship to United States national security; and to assess the future importance of the domestic aerospace industry for the economic and national security of the United States. The Commission will issue its final report on November 18, 2002.

### Hegemony Adv - Hegemony Impacts

#### Heg solves terrorism - deterrence

**Thayer, 07** (Bradley, Associate Professor in the Department of Defense and Strategic Studies, Missouri State University, “American Empire, Routledge”, 2007, AD: 07/12/12 | Kushal)

Another critical question is not simply how much the United States spends on defense but what benefits it receives from its spending: “Is the money spent worth it?” the benefits of American military power are considerable, and I will elaborate on five of them. First, and most importantly, the American people are protected from invasion and attack. The horrific attacks of 9/11 are—mercifully—an aberration. The men and women of the U.S. military and intelligence community do an outstanding job deterring aggression against the United States. Second, American interests abroad are protected. U.S. military power allows Washington to defeat its enemies overseas. For example, the United States has made the decision to attack terrorists far from America’s shores, and not to wait while they use bases in other countries to plan and train for attacks against the United States itself. Its military power also gives Washington the power to protect its interests abroad by deterring attacks against America’s interests or coercing potential or actual opponents. In international politics, coercion means dissuading an opponent from actions America does not want it to do or to do something that it wants done. For example, the United States wanted Libya to give up the weapons of mass destruction capabilities it pos-sessed or was developing. As Deputy Defense Secretary Paul Wolfowitz said, “I think the reason Mu’ammar Qadhai agreed to give up his weapons of mass destruction was because he saw what happened to Saddam Hussein.”21

### Trade Leadership Add-on

#### Increasing government investment in US airport infrastructure key to US trade leadership

DRI-WEFA 2002 [Global Insight Research Company, "The National Impact of Civil Aviation", July, http://www.aia-aerospace.org/stats/resources/DRI-WEFA\_EconomicImpactStudy.pdf] ttate

The disadvantages associated with the baseline future case examined in this study will detrimentally affect economic activity within the United States; they also will constrain the ability of the United States to compete in global markets. This section identifies the degree of global competition among nations, explores the key ways that this competition can be affected, illustrates how the United States currently competes globally, and suggests how the U.S. global competitive stance could be affected by the disadvantages associated with increasing air traffic delays.

Air Transportation and Economic Growth: From Economic Nationalism to a Global Economy

Since World War II, a key direction of global commerce has been the increasing integration of national economic activity. Industrial nations came together to form the Organization for Economic Corporation and Development (OECD). The General Agreement on Tariffs and Trade (GATT) was formed and then superseded by the World Trade Organization (WTO) to help facilitate a new era of accelerated global trade.

These trends reflect the global integration of economies as business increasingly sought not only to sell its products into wider markets, but also to coordinate production and distribution across national borders. Every region of the world has participated in these trends except for the Middle East, whose export statistics are distorted by the region’s huge exports of petroleum and related products.

This steady increase in trade activity has been enhanced by the growth of global air transportation. Clearly, air transportation has facilitated business’ ability to move its products around the world. But it has played a far more important role in bringing business managers together, enabling them to build the links, communications, and personal relationships necessary to achieve such a level of international business activity. Despite continuous advances in telecommunications technologies, the growth in global business over the past 50 years could not have been achieved without the personal contact enabled by the world’s air transportation system.

Not only is air transportation important to the global economy; it is also an important enabler of economic growth for individual economies. By developing its air transportation system, a country can better link itself to the global economy and provide an environment for its business that facilitates global activity. Conversely, there are distinct disadvantages for regions or communities that are beyond the reaches of efficient air transportation. In these regions, business remains more isolated and less able to reap the benefits offered by being connected to global economic activity.

Both adequate airport capacity and the efficiency with which the air transportation system works are critical to generating economic benefits. The main body of this report examines the impacts that a constrained system in the United States would have on the U.S. economy later in the decade. But it is also true that these constraints would inhibit the ability of the United States to compete in global markets, damaging its international competitiveness in general andtheinternational competitiveness of U.S. civil aviation specifically. This chapter examines some of the elements of such potential damage.

Competitiveness by Industry

Air Cargo

During the past three years, several analyses have shown that, in macroeconomic terms, U.S. integrated air express companies have created billions of dollars annually in reduced business inventory carrying costs, over $50 billion per year in logistics cost savings, and tens of billions of dollars of final demand and export sales that would not occur in the absence of their services.

The air express industry itself, including its ground transportation and logistics services divisions, generates approximately $60 billion a year in revenue and employs approximately 600,000 workers. In addition, a significant portion of the world’s freight is still carried either in the bellies of passenger aircraft or by all-cargo aircraft specializing in traditional “heavy freight.” These segments of the marketplace allow those shippers not necessarily demanding “express” service to enjoy the relative speed of movements by aircraft and to permit the transportation by air of oversized cargo to remote regions of the nation and world.

Global economic integration is characteristic of most of the world. Exports of goods and services in 2000 represented almost a quarter of the world’s GDP, up from just 10% in 1970. In turn, U.S. merchandise trade amounts to 22% of the world total. This steady increase in trade activity has been enhanced by the growth of global air transport.

Air Transportation and Tourism

In 1999, almost 48.5 million international visitors came to the United States, spending a total of $74.9 billion on travel-related expenses, such as lodging, gifts/souvenirs, food and beverages, and entertainment. They spent another $19.8 billion on U.S. air carriers in traveling to and from the United States. The total of air travel and travel related spending, $94.7 billion in 1999, has grown 62% since 1990, when international visitors spent about $58.3 billion in travel and travelrelated expenses to visit the United States. 22

This amount of spending is significant (the International Trade Administration—the source of these figures—estimates that foreign travel in the United States in 1999 supported over 1.1 million U.S. jobs), and exceeds the amount spent by Americans visiting other countries by $13.9 billion. In other words, the United States runs a surplus in its travel trade balance.

Anything adversely affecting this surplus, such as constrained infrastructure or regulatory barriers to adapting to market forces, would imply a decrease in the United States’ global competitiveness.

Other Industries

The increase in production costs added to American business by air transportation delays affects the U.S. global competitiveness of all industries. In this case, the increased air transportation costs implied by congestion delays raises the costs of production and distribution across the U.S. economy, resulting in a decrease in global competitiveness. An increase in air transportation costs impacts U.S. industries in two ways: higher air passenger transportation costs increase business travel and entertainment expenses, and higher air cargo costs affect those industries that utilize this form of transportation in their logistics.

Improved air transport infrastructure not only increases U.S. competitiveness in general, but also allows U.S. aviation itself to compete more effectively with foreign entities. Constraints in the U.S. air transport system first affect the economic well being of the aviation industry itself.

#### US trade leadership key to global trade - solves all global problems and checks back war

Panitchpakdi 4 [Supachai -, secretary-general of the UN Conference on Trade and Development, "American Leadership and the World Trade Organization", February 26, http://www.wto.org/english/news\_e/spsp\_e/spsp22\_e.htm] ttate

The second point is that strengthening the world trading system is essential to America's wider global objectives. Fighting terrorism, reducing poverty, improving health, integrating China and other countries in the global economy — all of these issues are linked, in one way or another, to world trade. This is not to say that trade is the answer to all America's economic concerns; only that meaningful solutions are inconceivable without it. The world trading system is the linchpin of today's global order — underpinning its security as well as its prosperity. A successful WTO is an example of how multilateralism can work. Conversely, if it weakens or fails, much else could fail with it. This is something which the US — at the epicentre of a more interdependent world — cannot afford to ignore. These priorities must continue to guide US policy — as they have done since the Second World War. America has been the main driving force behind eight rounds of multilateral trade negotiations, including the successful conclusion of the Uruguay Round and the creation of the WTO. The US — together with the EU — was instrumental in launching the latest Doha Round two years ago. Likewise, the recent initiative, spearheaded by Ambassador Zoellick, to re-energize the negotiations and move them towards a successful conclusion is yet another example of how essential the US is to the multilateral process — signalling that the US remains committed to further liberalization, that the Round is moving, and that other countries have a tangible reason to get on board. The reality is this: when the US leads the system can move forward; when it withdraws, the system drifts. The fact that US leadership is essential, does not mean it is easy. As WTO rules have expanded, so too has as the complexity of the issues the WTO deals with — everything from agriculture and accounting, to tariffs and telecommunication. The WTO is also exerting huge gravitational pull on countries to join — and participate actively — in the system. The WTO now has 146 Members — up from just 23 in 1947 — and this could easily rise to 170 or more within a decade. Emerging powers like China, Brazil, and India rightly demand a greater say in an institution in which they have a growing stake. So too do a rising number of voices outside the system as well. More and more people recognize that the WTO matters. More non-state actors — businesses, unions, environmentalists, development NGOs — want the multilateral system to reflect their causes and concerns. A decade ago, few people had even heard of the GATT. Today the WTO is front page news. A more visible WTO has inevitably become a more politicized WTO. The sound and fury surrounding the WTO's recent Ministerial Meeting in Cancun — let alone Seattle — underline how challenging managing the WTO can be. But these challenges can be exaggerated. They exist precisely because so many countries have embraced a common vision. Countries the world over have turned to open trade — and a rules-based system — as the key to their growth and development. They agreed to the Doha Round because they believed their interests lay in freer trade, stronger rules, a more effective WTO. Even in Cancun the great debate was whether the multilateral trading system was moving fast and far enough — not whether it should be rolled back. Indeed, it is critically important that we draw the right conclusions from Cancun — which are only now becoming clearer. The disappointment was that ministers were unable to reach agreement. The achievement was that they exposed the risks of failure, highlighted the need for North-South collaboration, and — after a period of introspection — acknowledged the inescapable logic of negotiation. Cancun showed that, if the challenges have increased, it is because the stakes are higher. The bigger challenge to American leadership comes from inside — not outside — the United States. In America's current debate about trade, jobs and globalization we have heard a lot about the costs of liberalization. We need to hear more about the opportunities. We need to be reminded of the advantages of America's openness and its trade with the world — about the economic growth tied to exports; the inflation-fighting role of imports, the innovative stimulus of global competition. We need to explain that freer trade works precisely because it involves positive change — better products, better job opportunities, better ways of doing things, better standards of living. While it is true that change can be threatening for people and societies, it is equally true that the vulnerable are not helped by resisting change — by putting up barriers and shutting out competition. They are helped by training, education, new and better opportunities that — with the right support policies — can flow from a globalized economy. The fact is that for every job in the US threatened by imports there is a growing number of high-paid, high skill jobs created by exports. Exports supported 7 million workers a decade ago; that number is approaching around 12 million today. And these new jobs — in aerospace, finance, information technology — pay 10 per cent more than the average American wage. We especially need to inject some clarity — and facts — into the current debate over the outsourcing of services jobs. Over the next decade, the US is projected to create an average of more than 2 million new services jobs a year — compared to roughly 200,000 services jobs that will be outsourced. I am well aware that this issue is the source of much anxiety in America today. Many Americans worry about the potential job losses that might arise from foreign competition in services sectors. But it’s worth remembering that concerns about the impact of foreign competition are not new. Many of the reservations people are expressing today are echoes of what we heard in the 1970s and 1980s. But people at that time didn’t fully appreciate the power of American ingenuity. Remarkable advances in technology and productivity laid the foundation for unprecedented job creation in the 1990s and there is no reason to doubt that this country, which has shown time and again such remarkable potential for competing in the global economy, will not soon embark again on such a burst of job-creation. America's openness to service-sector trade — combined with the high skills of its workforce — will lead to more growth, stronger industries, and a shift towards higher value-added, higher-paying employment. Conversely, closing the door to service trade is a strategy for killing jobs, not saving them. Americans have never run from a challenge and have never been defeatist in the face of strong competition. Part of this challenge is to create the conditions for global growth and job creation here and around the world. I believe Americans realize what is at stake. The process of opening to global trade can be disruptive, but they recognize that the US economy cannot grow and prosper any other way. They recognize the importance of finding global solutions to shared global problems. Besides, what is the alternative to the WTO? Some argue that the world's only superpower need not be tied down by the constraints of the multilateral system. They claim that US sovereignty is compromised by international rules, and that multilateral institutions limit rather than expand US influence. Americans should be deeply sceptical about these claims. Almost none of the trade issues facing the US today are any easier to solve unilaterally, bilaterally or regionally. The reality is probably just the opposite. What sense does it make — for example — to negotiate e-commerce rules bilaterally? Who would be interested in disciplining agricultural subsidies in a regional agreement but not globally? How can bilateral deals — even dozens of them — come close to matching the economic impact of agreeing to global free trade among 146 countries? Bilateral and regional deals can sometimes be a complement to the multilateral system, but they can never be a substitute. There is a bigger danger. By treating some countries preferentially, bilateral and regional deals exclude others — fragmenting global trade and distorting the world economy. Instead of liberalizing trade — and widening growth — they carve it up. Worse, they have a domino effect: bilateral deals inevitably beget more bilateral deals, as countries left outside are forced to seek their own preferential arrangements, or risk further marginalization. This is precisely what we see happening today. There are already over two hundred bilateral and regional agreements in existence, and each month we hear of a new or expanded deal. There is a basic contradiction in the assumption that bilateral approaches serve to strengthen the multilateral, rules-based system. Even when intended to spur free trade, they can ultimately risk undermining it. This is in no one's interest, least of all the United States. America led in the creation of the multilateral system after 1945 precisely to avoid a return to hostile blocs — blocs that had done so much to fuel interwar instability and conflict. America's vision, in the words of Cordell Hull, was that “enduring peace and the welfare of nations was indissolubly connected with the friendliness, fairness and freedom of world trade”. Trade would bind nations together, making another war unthinkable. Non-discriminatory rules would prevent a return to preferential deals and closed alliances. A network of multilateral initiatives and organizations — the Marshal Plan, the IMF, the World Bank, and the GATT, now the WTO — would provide the institutional bedrock for the international rule of law, not power. Underpinning all this was the idea that freedom — free trade, free democracies, the free exchange of ideas — was essential to peace and prosperity, a more just world. It is a vision that has emerged pre-eminent a half century later. Trade has expanded twenty-fold since 1950. Millions in Asia, Latin America, and Africa are being lifted out of poverty, and millions more have new hope for the future. All the great powers — the US, Europe, Japan, India, China and soon Russia — are part of a rules-based multilateral trading system, greatly increasing the chances for world prosperity and peace. There is a growing realization that — in our interdependent world — sovereignty is constrained, not by multilateral rules, but by the absence of rules.

### Trade Exts - Trade checks nuclear war

#### Trade prevents nuclear war

Panzner 8 [Michael - faculty @ New York Institute of Finance, *Financial Armageddon: Protect your Future from Economic Collapse*, pages 136-138] ttate

Continuing calls for curbs on the flow of finance and trade will inspire the United States and other nations to spew forth protectionist legislation like the notorious Smoot-Hawley bill. Introduced at the start of the Great Depression, it triggered a series of tit-for-tat economic responses, which many commentators believe helped turn a serious economic downturn into a prolonged and devastating global disaster. But if history is any guide, those lessons will have been long forgotten during the next collapse. Eventually, fed by a mood of desperation and growing public anger, restrictions on trade, finance, investment, and immigration will almost certainly intensify. Authorities and ordinary citizens will likely scrutinize the cross-border movement of Americans and outsiders alike, and lawmakers may even call for a general crackdown on nonessential travel. Meanwhile, many nations will make transporting or sending funds to other countries exceedingly difficult. As desperate officials try to limit the fallout from decades of ill-conceived, corrupt, and reckless policies, they will introduce controls on foreign exchange. Foreign individuals and companies seeking to acquire certain American infrastructure assets, or trying to buy property and other assets on the cheap thanks to a rapidly depreciating dollar, will be stymied by limits on investment by noncitizens. Those efforts will cause spasms to ripple across economies and markets, disrupting global payment, settlement, and clearing mechanisms. All of this will, of course, continue to undermine business confidence and consumer spending. In a world of lockouts and lockdowns, any link that transmits systemic financial pressures across markets through arbitrage or portfolio-based risk management, or that allows diseases to be easily spread from one country to the next by tourists and wildlife, or that otherwise facilitates unwelcome exchanges of any kind will be viewed with suspicion and dealt with accordingly. The rise in isolationism and protectionism will bring about ever more heated arguments and dangerous confrontations over shared sources of oil, gas, and other key commodities as well as factors of production that must, out of necessity, be acquired from less-than-friendly nations. Whether involving raw materials used in strategic industries or basic necessities such as food, water, and energy, efforts to secure adequate supplies will take increasing precedence in a world where demand seems constantly out of kilter with supply. Disputes over the misuse, overuse, and pollution of the environment and natural resources will become more commonplace. Around the world, such tensions will give rise to full-scale military encounters, often with minimal provocation. In some instances, economic conditions will serve as a convenient pretext for conflicts that stem from cultural and religious differences. Alternatively, nations may look to divert attention away from domestic problems by channeling frustration and populist sentiment toward other countries and cultures. Enabled by cheap technology and the waning threat of American retribution, terrorist groups will likely boost the frequency and scale of their horrifying attacks, bringing the threat of random violence to a whole new level. Turbulent conditions will encourage aggressive saber rattling and interdictions by rogue nations running amok. Age-old clashes will also take on a new, more heated sense of urgency. China will likely assume an increasingly belligerent posture toward Taiwan, while Iran may embark on overt colonization of its neighbors in the Mideast. Israel, for its part, may look to draw a dwindling list of allies from around the world into a growing number of conflicts. Some observers, like John Mearsheimer, a political scientist at the University of Chicago, have even speculated that an “intense confrontation” between the United States and China is “inevitable” at some point. More than a few disputes will turn out to be almost wholly ideological. Growing cultural and religious differences will be transformed from wars of words to battles soaked in blood. Long-simmering resentments could also degenerate quickly, spurring the basest of human instincts and triggering genocidal acts. Terrorists employing biological or nuclear weapons will vie with conventional forces using jets, cruise missiles, and bunker-busting bombs to cause widespread destruction. Many will interpret stepped-up conflicts between Muslims and Western societies as the beginnings of a new world war.

### Solvency Exts - NextGen saves airline industry

#### Next Gen will save the collapsing airline industry

JPDO 10, The Joint Planning and Development Office, http://www.afceadc.org/events/special-events/past-conferences-symposia/beyond-soa-and-cloud/case-study-nextgen/, "Aviation, NextGen and Advanced Information Sharing: A new paradigm in information management”, 3/18/12. jeong

The rapid sharing of digital information, much of it in a real time environment, is vital to the future success of what’s called the Next Generation Air Transportation System (NextGen). This is a capability that’s well understood in other areas of government and industry. But in many respects it’s relatively new to the aviation community. ¶ NextGen represents nothing short of the total transformation of the nation’s air transportation system. In 2007 America’s aviation system handled 63.1 million flights with some 750 million emplanements. Aviation and aviation related industries account for over 5% of our nation’s gross domestic product and is responsible for the employment of 11 million Americans. It’s a dynamic economic engine.¶ However, much of the current aviation system, though reliable and safe, is built on technologies developed as long ago as World War II. These include radar, ground control (by voice) of aircraft, and point-to-point navigation beacons. NextGen, through the application of new technologies, capabilities and procedures, will improve the efficiency, and most notably, the “scalability” of our nation’s aviation system. This means that the system can grow and change to more comfortably meet increased demand and new aviation business models. For all practical purposes this isn’t possible with our current system.¶ Some of the core technologies that will underpin the development of NextGen include satellite-based navigation of aircraft, advanced digital communications, and advanced automation of aircraft trajectories. However, an inherent requirement to the application of these groundbreaking capabilities is the development of Net-Centric Operations. Net-Centric Operations is the sharing of advanced digital information within an aviation based network environment.¶ How NextGen came to be…¶ In 2003 the Congress chartered the Joint Planning and Development Office (JPDO) to serve as the coordinator and planner for a new, one of a kind, multi-agency initiative, working closely with industry, to develop the Next Generation Air Transportation System (NextGen). NextGen, as noted above, is a large scale undertaking whose objective is nothing short of transforming our nation’s air transportation system. Few initiatives undertaken by government have been so long term of massive in scope.¶ This transformation effort is highly unique in that it involves close coordination between the Departments of Transportation, Defense, Homeland Security, and Commerce, as well as NASA, the FAA, and the White House Office of Science and Technology Policy. In addition, it also necessitates a full partnership, on a level unprecedented for any government sponsored initiative, with industry. The idea is surprisingly simple. Through coordinated planning, budgeting and leveraged research, the JPDO, is coordinating one of the most dramatic initiatives in the history of transportation.¶ A multi-industry challenge¶ Net-Centric Operations and Shared Information capabilities will provide the core capability necessary to make NextGen a success. It will enable the real time exchange of digital information at all levels of system operations (air-to-air, air-to-ground, and ground-to-ground) as well as with crucial satellite-based information sources. It involves the real time sharing of information and data among users, systems, and networks. It only makes sense, as the aviation industry looks towards applying this kind of data sharing technology that it look towards the private sector for the new technological capabilities that will be required.¶ This kind of information sharing is not only a challenge for the aviation community. It goes far beyond that, and includes a range of information technologies, from advanced networking to entirely new approaches to data tagging and cyber security. To be successful, it requires an alliance between several different industries. In many respects net-centric operations in the aviation community, on a scale such as that offered by NextGen, represents one of the most profound technical and operational challenges of the 21st century.

### Solvency Exts - NextGen tech effective

#### NextGen solves - will modernize air transportation to make air travel safer, more effective, and more efficient

Culler 12(Jessica, NASA Ames Research Center, “8 Questions about NextGen, Part 1: How We'll Get Where We're Going Tomorrow”, 1/18/12, AD: 07/14/12, <http://www.nasa.gov/topics/aeronautics/features/8q_nextgen.html> | Kushal)

The United States is undertaking the largest transformation of air traffic control ever attempted. Known as the Next Generation Air Transportation System, or NextGen, it is a multi-billion-dollar technology modernization effort that will make air travel safer, more flexible and more efficient. As the system gets better, its capacity will grow and the demand for different types of air transportation – even unmanned aircraft – will increase. ¶ NASA is one of several U.S. government agencies that play a crucial role in helping to plan, develop and implement NextGen. NASA's role is research and development of new ideas and technologies that will make NextGen a reality. We're working on software that reduces airport runway and surface congestion, new landing techniques that save fuel and time, computer models that predict more accurately the influence of weather on flight paths, and air traffic control solutions that allow more takeoffs and landings in the same amount of time.¶ Because NextGen is not just about air traffic management, we're also working on the tools and scientific knowledge needed to advance engine and airframe technology for today's aircraft, and develop unconventional new vehicles that will fly faster, cleaner and quieter, and use less fuel. ¶ We asked NASA researchers to answer some questions about NextGen and the aircraft that will make the system complete. ¶ Below, Leighton Quon, project manager of NextGen Systems Analysis, Integration, and Evaluation at NASA's Ames Research Center, Moffett Field, Calif., answers eight questions about what NASA is doing to help improve air transportation for all of us in the future.¶ Coming soon: A question-and-answer session with the managers of projects working to develop advanced design ideas for the new and improved aircraft that will be flying in NextGen.¶ 1) What is "NextGen"?¶ (Click to view answer)¶ Leighton: NextGen stands for the Next Generation Air Transportation System. The current air transportation system includes all of the air traffic controllers, their equipment and software, the control tower facilities in which they work, the radars and the radio beacons on the ground that help pilots navigate throughout the country. Basically, it's what gets aircraft on their planned paths and what keeps them from flying too close to each other. The Federal Aviation Administration (FAA) leads the process of implementing updates to that system, with NASA and others as partners. We call the updates "NextGen."¶ 2) What would be the benefits of an updated air transportation system?¶ (Click to view answer)¶ Leighton: NextGen will make air travel more dependable and efficient. In this case, “efficient” means to reduce the resources with less fuel burned, less time taken or even more flights in a given time. It will provide improvements to how air traffic is managed, saving fuel and reducing noise, emissions, congestion and delays.¶ 3) How will NextGen affect me?¶ (Click to view answer)¶ Leighton: It will allow more planes in the sky, which means more air travel options. It will allow more efficient routes that will get you where you’re going faster with fewer delays. And , it will do it all with fewer emissions. If you live near an airport, NextGen will also help reduce noise near your home. The system will be less prone to major disruptions such as storms, too.¶ 4) Why NextGen now?¶ (Click to view answer)¶ A standard light beacon that replaced bonfires in the early air navigation system. Image credit: Federal Aviation Administration¶ Leighton: Air traffic management has evolved over time, but it hasn’t changed very much since the 1950s. For example, in the early 1920s the U.S. Postal Service had the mail flown across the country mostly during daylight hours. A way to fly the mail at night was needed, so they would place bonfires along the navigational routes and the planes would fly from bonfire to bonfire. The planes weren’t that fast and there weren’t as many aircraft flying, so a method of visual guidance was enough to get everyone where they needed to go. The bonfires were replaced with radio beacons in the 1930s. In the 1950s, radar was introduced. Ever since then, the air traffic management system has relied on post-World War II era technologies of radio-based navigation aids, radar and radios. Today we are using advanced versions of these same technologies.¶ 5) How will NextGen be different?¶ (Click to view answer)¶ Leighton: Aircraft generally fly indirect, even zig-zag, paths over a series of ground-based radio beacons. Controllers "watch" the progress of the flights on radar and direct the aircraft individually by radio if they need to alter their paths. The efficiency of a flight route is very limited by the old radio, ground based beacons and radar technology. NextGen will use modern technologies to determine the position of planes much more precisely so they don’t need to follow the ground stations. A satellite-based positioning system using GPS called Automatic Dependent Surveillance-Broadcast, or ADS-B, will be used to accurately determine the position of an aircraft, and this accurate information will be broadcast over a network. Computers, both in the aircraft and on the ground, will help offload some of the work and information processing from humans to support choosing the most efficient paths to fly while still keeping a safe distance from other aircraft. All of these technologies working together will help make air travel more dependable and efficient.¶ 6) What is NASA's role in NextGen?¶ (Click to view answer)¶ Controllers using the Efficient Descent Advisor in a simulation, and a chart of regular and efficient descent profiles. Image credit: NASA¶ Leighton: The primary role of NASA in the NextGen partnership is research and development of concepts and technologies. In the Airspace Systems Program where I work at NASA, we divide this into two groups - one that develops new concepts and technologies, and the other – the area I manage – analyzes, integrates and evaluates the new ideas to get them closer to being ready to use. We're all working toward new and innovative ways to manage air traffic, primarily through creating new software tools and new ways of doing things, in the air and on the ground. We have years of successful work on all kinds of aspects of this, but the ground-based technologies that allow controllers in all of their various roles to be more efficient and handle more aircraft traffic is one of our big areas of focus. This includes new computer applications, computer systems, hardware and ways to use all of these together in an integrated way. So NASA develops new ideas, tries them out through simulations and field tests, and reports the results to the FAA. The FAA then uses that background to create new formal air traffic management procedures, tests those out to make sure they’re safe, certifies them and makes them operational.¶ 7) Specifically, what kinds of things are researchers working on right now?¶ (Click to view answer)¶ Leighton: There are a bunch of things researchers are working on. We try and address the major constraints that create inefficiencies, and this generally includes all the phases of flight from your departure gate to your arrival gate, as well as other issues that might relate to weather. From the time you board your flight and are ready to leave the gate, there are already opportunities to make the operations more efficient with new concepts we are developing. Here are some examples:¶ Precision Departure Release Capability (Click to Expand)¶ Spot and Runway Departure Advisor (Click to Expand)¶ Trajectory Based Automation System (Click to Expand)¶ Efficient Descent Advisor and 3-Dimensional Path Arrival Management (Click to Expand)¶ Air Traffic Management (ATM) Technology Demonstration (Click to Expand)¶ Together, these tools will bring your flight to the runway landing on schedule and SARDA will once again help find the best path for your plane to make its way into its arrival gate.¶ Even some of these new technologies could use additional information from time to time. When the winds at an airport begin to change, the runways used for takeoff and landing may have to be switched. For example, all the airplanes may have to start landing from the north when they were landing from the east. The Runway Configuration Manager (RCM) is a tool that will give information to either the operators or potentially some of the other automated scheduling tools when the airport setup needs to be changed. With enough advance notice, the This visualization of flights on the east coast shows several flights in circling holding patterns awaiting landing approval. With NextGen guidance, flight takeoff can be optimized to reduce in-flight waiting due to weather.Image credit: NASA¶ airplanes can be directed to the new runways without wasting time and fuel turning around on the airport taxiways or changing directions in the air. ¶ Additionally, there are various weather issues that could happen in one small area that can affect the airline operations throughout the country. In San Francisco, stratus is the marine layer or "fog" that the Bay Area sees during the summer months. Because the layer can obscure the pilot’s view of the airport during landing, the aircraft must fly an instrument-guided approach. Currently, when there's fog like this, planes have to land single-file into the San Francisco airport (SFO), as opposed to when it is clear and planes can approach and land in pairs, almost side by side. NASA has developed a computer tool we call SFO Stratus that helps advise the FAA System Command Center, where the nation's "coaches calling the plays" for the whole national system are located. With the tool advisories, they can make more accurate decisions on when to let airplanes around the country leave for San Francisco so that by the time the planes arrive the fog will have lifted and they can use the more efficient side-by-side arrivals. Without the tool, the FAA System Command Center may send too many planes too early or perhaps might hold planes back all over the country, unnecessarily causing delays to you and me during our travels. ¶ 8) When will all this affect me?¶ (Click to view answer)¶ Leighton: Technologies such as the SFO Stratus tool were actually being tested in the field by the FAA in the 2011 summer season. During this test phase there should be some benefit for the whole system including travelers. Each of the other technologies is in various stages of development. The PDRC is about to make its way into field testing for the first time. EDA, TBAS, SARDA and the components of ATD-1 have seen extensive testing in NASA's own simulation labs. This is typically the step right before trying them in the real world. There are numerous other technologies in early stages of development and experiments by researchers, not to mention the ideas yet to be thought of by our innovative staff. ¶ Permanent implementation of the tools will be the responsibility of our partner agency, the FAA. It operates air transportation every day of the year so that we can fly to the multitude of places we want to or need to go, and will build and implement the actual Next Generation system of the future.

#### NextGen tech effective and ready to implement - will give pilots more information, will provide for faster radar sweeps,

Mims 11, [Christopher - contributor to Good, Technology Review and The Huffington Post, and is a former editor at Scientific American and Grist.org.,”NextGen will change air travel, Why the delay?”,7/8/11] jeong

The way we prevent planes from crashing into one another hasn’t changed much since World War II. But by 2020, and in some places much sooner, air traffic control, navigation, and the nature of flight itself will undergo a transformation as momentous as the invention of radar itself. The results, according to the Federal Aviation Administration, will be safer skies, fewer delays, and significantly lower costs – for the taxpayer, at least.To understand just how different Next Generation technology, or NextGen, is from our current air traffic control system, it helps to know a little about the one we have now. The first thing to know is that pilots generally have little idea where other planes are. All of that knowledge resides with the air traffic controller, and even his or her picture of the sky is limited. Ground radar over major air routes only sweeps the sky once every 12 seconds, while radar at terminals sweeps every four. In four seconds, a jet can travel several miles. Over oceans and certain flight routes without radar — say the interior of Australia and across Greenland, planes have historically been more or less invisible to controllers and each other. Pilots have a limited ability to adapt to changing conditions, can become trapped at certain altitudes by the possibility that other planes are above them, and must put large distances between themselves and other planes to account for the overall sluggishness of the system.If the existing air traffic control system is operated more or less like a giant ham radio club, then NextGen is the dawning of the Internet age. Planes in the sky are part of a digital mesh network, in which every one of them can see and be seen by all the other nearby planes. They can communicate with one another without interfacing with the ground, transmitting their heading and velocity as well as a host of other information — weather, conditions, even the margin of error of their own instruments. All this data is transmitted once per second and allows pilots to react to one another in real time, fly in tighter formations, stick with pre-programmed computer-plotted routes through crowded airspace and save fuel by shifting engines to idle when descending into airports. Despite these benefits, many airlines have made it clear they’re not going to implement the most important portions of NextGen until the FAA forces them to. The CEOs of both [Delta](http://www.centreforaviation.com/news/2011/04/27/delta-makes-best-argument-yet-for-waiting-to-equip-for-nextgen/page1) and [US Airways](http://www.centreforaviation.com/news/2011/04/07/us-airways-doubts-need-for-big-infrastructure-projects/page1) argue that air traffic isn’t growing fast enough to justify the increased density of planes in the sky that is one of the primary benefits of NextGen. It doesn’t help that while NextGen means the FAA’s costs will go down, the cost to the airlines of the transition will be on the order of $25 billion.The intransigence of air carriers aside, the most important technical standards for NextGen have been finalized. Much of the equipment has been put through its paces, and in some parts of the world, including the U.S., some of its most important components are already in service. By the end of 2012, the U.S. will be fully covered with the radio receivers that will replace conventional radar, according to R. John Hansman, director of the [International Center for Air Transportation](http://web.mit.edu/aeroastro/labs/icat/) at MIT. NextGen is satellite enabled, which means that airplanes in the system can use GPS to determine their location. But this doesn’t mean the system is dependent on GPS, says Hansman, who points out that airplanes have long had other sources of location information, including [inertial navigation](http://www.technologyreview.com/blog/mimssbits/26551/), which uses dead reckoning to determine location based on last known position, as well as [transponder-based radio navigation](http://en.wikipedia.org/wiki/Distance_measuring_equipment) systems. The FAA will also continue to maintain some radar installations, which will also be a last line of defense against “uncooperative targets, in other words, terrorists,” says Hansman.Some carriers are already enjoying some of the benefits of the core communication system of NextGen, known as [Automatic Dependent Surveillance-Broadcast, or ADS-B](http://en.wikipedia.org/wiki/Automatic_dependent_surveillance-broadcast). By 2015, most of the countries in Europe and Asia will require that all planes in their airspace be equipped with ADS-B “out,” which broadcasts the location of a plane. The same technology will be [mandated in U.S. airspace by 2020](http://www.aviationweek.com/aw/generic/story_generic.jsp?channel=businessweekly&id=news/bav05312010p1.xml).UPS has been experimenting with ADS-B since 1996, according to Mike Mangeot, a company spokesman. Its entire fleet is equipped with both ADS-B in and out, which means its planes not only broadcast their location but can see the location of every other plane with the equipment. UPS has a special incentive to pioneer this technology — at its packed world-wide air hub in Louisville, [delays of even a few minutes can be problematic](http://www.aviationweek.com/aw/generic/story_generic.jsp?channel=awst&id=news/aw110606p1.xml&headline=UPS%20Pioneers%20ADS-B). ADS-B also allows UPS to engage in “Continuous Descent Approaches,” in which “an aircraft coasts into an airport with its engines at idle thrust, rather than stepping down in a traditional landing. This reduces noise and nitrous oxide emissions and reduces fuel consumption,” says Mangeot.The fact that NextGen will reduce costs for the FAA, by eliminating the need for many expensive radar installations and the overtaxed air traffic controllers who run them, has led some in industry to conclude that the agency should foot most of the bill. The FAA has already [spent $4.4 billion](http://www.marketwatch.com/story/faa-to-hand-out-25-bln-more-in-nextgen-contracts-2010-06-03) of the $7 billion it currently has allotted to realize NextGen. To incentivize airlines to cover the cost of retrofitting their own planes with ADS-B and, in some cases, new navigational systems, which Hansman says can run to hundreds of thousands of dollars a plane for a large commercial aircraft, the agency is considering giving carriers who install the equipment before the 2020 deadline privileged access to airports.If that doesn’t work, there’s always the argument that, as fuel costs rise, the routes that can be plotted with precise satellite navigation will save enough fuel to [justify the cost of retrofits](http://www.businessweek.com/lifestyle/travelers_check/archives/2011/02/faa_hopes_jetblue_can_deliver_a_next-gen_boost.html). Southwest Airlines has already made this kind of commitment, and is [saving $16 million a year in fuel as a result](http://www.greenbiz.com/news/2011/01/11/southwest-save-16-million-fuel-costs-nextgen-navigation). It’s also been [proposed that the FAA subsidize airlines’ costs for upgrading](http://www.greenbiz.com/news/2011/01/11/southwest-save-16-million-fuel-costs-nextgen-navigation), but that [seems unlikely in the current fiscal climate in Washington](http://www.washingtonpost.com/local/antidote-to-air-gridlock-is-complex-undertaking/2011/06/30/AG9bdnwH_story.html).Many of the benefits of NextGen, such as safety and improved awareness for America’s many small airplanes, are public goods that are not likely to be justified on the grounds of cost alone, anyway. That’s just one of the reasons it has taken this long to realize a system that was first proposed in the 1980s. Another is that a misconception remains that NextGen is a monolithic enterprise that will be realized all at once, and can’t be rolled out in pieces.“NextGen is completely based on an incremental rollout; it’s designed to be scalable” says Laura Brown, deputy assistant administrator for public affairs at the FAA. One of the dimensions of the technology that will continue to scale is a feature of NextGen that will be present only in the U.S.: A high-bandwidth data channel, known as UAT, which will allow ground controllers to send almost any kind of digital communication to planes. Literally, an Internet in the sky.

### Solvency Exts - Tech ready

#### Next Gen tech ready to be implemented

#### Nextgen key components are ready

AviationWeek 12 http://www.aviationweek.com/Article.aspx?id=/article-xml/AW\_05\_14\_2012\_p38-456385.xml,”Initial NextGen Components Falling Into Place”, 4/14/12. jeong

Almost from the beginning, the FAA's NextGen initiative has been dogged by accusations of slow progress. But now there is growing evidence that the grand air traffic management vision is moving off the drawing board and closer to reality.¶ Significant headway is being made on key operational, technical and financial issues. The cornerstone satellite-based surveillance network is being rolled out, and work is about to begin on a transformative air-ground data communication system. The first benefits are emerging from an airspace redesign effort in large metropolitan areas and—perhaps most importantly—a novel plan for funding aircraft equipage is gathering momentum.¶ There is undoubtedly still a long way to go, and debate will continue about whether NextGen should move faster. However, this does not negate the fact that the initial pieces are falling into place— with major ramifications for the U.S. aviation industry.¶ NextGen was launched in 2004, the result of an ambitious call to transform the U.S. air transport system by 2025. Potential threats to the FAA's budget are an ever-present concern, but an even bigger question mark has been how aircraft operators will pay for the equipment needed to operate in the modernized environment. U.S. airlines are strapped for cash and are reluctant to invest in new avionics unless they can see a compelling business case.¶ The FAA is showing signs that it is prepared to help airlines pay for at least some equipment. As part of its data communications program, it intends to set aside $80 million to help carriers make the necessary upgrades to their aircraft.¶ On a broader scale, the equipage funding solution with the most potential is public-private partnerships, where government loan guarantees would help unlock private equity at reasonable rates.¶ One such initiative, called the NextGen Fund, has been proposed by Nexa Capital Partners, with the backing of ITT Exelis. The plan is for participating airlines to pay back equipage costs as the financial benefits of NextGen emerge.

### Solvency Exts - Quick timeframe

#### Fully funding Next Gen means full implementation within three years

Wilson 2010 [J.R. - contributing writer, "A slow transformation", *Aerospace America*, May 10, http://www.aerospaceamerica.org/Documents/ May%202010%20Aerospace%20America%20PDF%20Files/30\_NextGen\_MAY2010.pdf] ttate

“The aviation industry—from the makers of planes to the people and companies who fly them, from foreign air navigation service providers to local airports—all agree that, with adequate resources, we, government and industry can work together to bring NextGen to implementation in 3-5 years instead of the 10-15 years that is currently pegged,” Aerospace Industries Association president and former FAA administrator Marion 9 a symposium on ADS-B (Automatic Dependent Surveillance-Broadcast) last fall. “So, what is holding us back? Funding. Not an inconsequential barrier when you consider the economy, the state of the airline industry and multiple priorities weighing on the administration and Congress.”

### Solvency Exts - Decreases air congestion

#### NextGen prevents traffic congestion

**FAA 12** (Federal Aviation Administration, “NextGen Implementation Plan March 2012 ”, 2012, AD; 07/12/12, <http://www.faa.gov/nextgen/implementation/media/NextGen_Implementation_Plan_2012.pdf> | Kushal)

With NextGen, we continue to advance safety as we look to increase air traffic and accommodate unmanned aircraft systems and commercial space flights. To minimize risk as we bring together a wave of new NextGen capabilities during the next decade, the aviation community relies on integrated safety cases and other proactive forms of management that allow us to assess the risk of proposed changes. Policies, procedures and systems on the ground and on the flight deck enable the mid-term system. We enhance technologies and procedures that are in use today, as we introduce innovations that will fundamentally change air traffic automation, surveillance, communications, navigation and the way we manage information. In addition to the advances we develop through NextGen transformational programs and implementation portfolios, the mid-term system depends on coordination across FAA lines of business, including specialists on safety, airports, the environment, policy development and air traffic management. FAA information and management systems must keep these activities synchronized as we approach the mid-term, reach it and move forward. We use a strategic Environmental Management System approach to integrate environmental and energy objectives into the planning, decision making and operation of NextGen.

#### **Next Gen tech relies on satellite signals - increases the efficiency of air traffic control and will reduce congestion**

FAA 12**,** (Federal Aviation Administration, “What is NextGen?”, 2012, AD: 07/09/12, <http://www.faa.gov/nextgen/slides/?slide=2> | Kushal)

NextGen is the transformation of how airplanes traverse the sky. It affects all of us: from the pilots that fly the planes, the passengers who enjoy the flights and the controllers who ensure the safety. The thousands of planes overhead right now are flying indirect routes over radar towers. For close to six decades we have used this World War II era technology to transit the skies. NextGen is an upgrade to satellite-based technology. Piece by piece we are installing this new system. It is a consistent and persistent effort to bring airplanes and airports online with NextGen technology. Satellite navigation will let pilots know the precise locations of other airplanes around them. That allows more planes in the sky while enhancing the safety of travel. Satellite landing procedures will let pilots arrive at airports more predictably and more efficiently. And once on the ground, satellite monitoring of airplanes leads to getting you to the gate faster. Already we are starting to see benefits. By the year 2018 we are expecting to see savings of hundreds of dollars per flight. Multiply that by the millions of flights that occur in a typical year and savings become extraordinary. But most importantly, NextGen enhances the safety of what is already the safest airspace in the world. And it ensures our stellar safety history will continue in the same tradition. What is NextGen? A new era of flight.

Next Gen tech will decrease air traffic congestion - makes our air space more efficient

Federal Aviation Agency (FAA),12, Federal Aviation Agency, “FAA to increase efficiency and reduce Aircraft emissions in northern California airspace”,3/19/12] Jeong

OAKLAND – Acting Federal Aviation Administrator Michael Huerta and aviation partners today kicked off a collaborative effort to make air traffic control more efficient, help airlines improve on-time performance, and reduce emissions generated by aircraft flying into and out of Northern California airports.“By working together, the FAA and our aviation partners are improving flying for the general public, airlines and the country's economy,” said U.S. Transportation Secretary Ray LaHood. “Designing an aviation system for the 21st century is a crucial component of an economy built to last.”“The Federal Aviation Administration and members of the aviation industry are teaming up to create satellite-based arrival and departure routes that will make some of the most complex airspace in the country some of the most efficient,” Huerta said. “Implementing these NextGen procedures will result in more direct flight routes, fewer delays and an even safer, greener flying experience.”As part of the FAA’s NextGen modernization program, the Metroplex initiative will improve the flow of air traffic into and out of the major airports in Northern California by making airspace more efficient. A Metroplex is a region with multiple airports serving major metropolitan areas where heavy airport activity and environmental constraints combine to hinder the efficient movement of air traffic. Metroplex initiatives are under way or planned in 21 metropolitan areas across the country.The Metroplex initiative is based on satellite navigation, or Performance-Based Navigation (PBN), which is a key component of NextGen. PBN enables pilots to fly aircraft using radar or satellite coverage, or by using the on-board flight management system. PBN allows shorter, more direct routes that reduce flight time and fuel consumption, and result in fewer carbon emissions. The FAA estimates that 1.5 million fewer nautical miles will be flown into and out of Northern California annually, based on current flight plan miles filed. This equates to 2.3 million fewer gallons of fuel used and a reduction in carbon emissions of 23,000 metric tons. Launched today, this collaborative, regional partnership includes the FAA, the National Air Traffic Controllers Association (NATCA), United Airlines, Southwest Airlines and the airports in San Francisco, Oakland, San Jose and Sacramento.“The Bay Area is fortunate to have such a strong, effective team working on the Metroplex project. The collaboration between management, NATCA and the industry has been outstanding," said Steve Hefley, NATCA's lead local representative on the team. “We plan to deliver on our promise. Air travelers will benefit greatly from an even safer and more efficient system.""Southwest Airlines is committed to the design and implementation of safe and efficient flight procedures that benefit the traveling public and the communities surrounding the Northern California Metroplex,” said Southwest Airlines Captain David Newton, the carrier’s senior manager for NextGen and airspace.The Metroplex work teams will explore and develop strategies to streamline airspace over Northern California to help reduce airspace complexity for air traffic controllers and flight crews. The strategies include: Creating Optimized Profile Descent (OPD) procedures into San Francisco, Oakland, San Jose and Sacramento. OPDs allow pilots to almost idle the engines while the aircraft descends so they glide down without leveling off, like sliding down a bannister. OPDs reduce fuel consumption, carbon emissions and noise. Separating the arrival flows into San Francisco, Oakland, San Jose and Sacramento to reduce congestion. This will also shorten the route into San Jose. Implementing satellite-based departure procedures at San Francisco, Oakland and San Jose. These procedures are expected to provide predictable, repeatable paths and optimize aircraft ascents, thus reducing the need to level off. Shortening flight tracks by making them more direct. Designing a new, high-altitude route that skirts the northern boundary of the military airspace around the Edwards Range Complex. Commercial aircraft will be able to use this procedure when an air route through the complex is frequently unavailable due to military activity. Creating a high-altitude holding area east of San Francisco that controllers can use when bad weather reduces the airport’s arrival rate. This would create more predictability for air traffic controllers and pilots and allow aircraft to hold at higher altitudes where they burn less fuel. Building a new route that Los Angeles-bound aircraft could start using when they are still offshore in Oakland Center’s high altitude airspace. The route could allow aircraft to remain longer at higher altitudes, where they burn less fuel, and could provide OPD-like benefits for much of the approach. "Oakland International Airport and the Federal Aviation Administration are aligned in our mutual goals of on-time operations, environmental leadership and embracing technology for improved performance,” said Deborah Ale Flint, Director of Aviation for the Port of Oakland. “We are committed to being a part of the regional approach to optimizing air space in Northern California, an outcome that will create more direct routing, and reduce delays, fuel burn and emissions using NextGen, satellite-based technology."“The implementation of NextGen is a ‘win-win-win’ for airports, the airlines, and the air traveler,” said San Francisco International Airport Director John L. Martin. “With more efficient routing, congestion at airports is relieved, airlines run more efficiently and burn less fuel, and passengers can look forward to more options when they travel.”“Mineta San Jose International Airport looks forward to participating in this project,” said Bill Sherry, Director of Aviation for the City of San Jose. “The implementation of NextGen will significantly benefit the travelers and residents of Northern California by reducing overall congestion and delays at the Bay Area airports.”NextGen is the transformation of the radar-based air traffic control system of today to a satellite-based system of the future. New procedures and technologies will significantly improve safety, efficiency and reduce fuel burn and carbon emissions.

#### Next Gen tech will decrease congestion in our airspace - will decrease the size of traffic bubble in plane spacing

Mark,Phelps,12, [http://www.bjtonline.com/business-jet-news/why-%E2%80%98nextgen%E2%80%99-matters,”Why ‘NextGen’ matters “,4/20/12,writer and editorial consultant for numerous aviation news and magazines.] Jeong

The congressional logjam blocking long-term FAA funding in the U.S. appears to be broken. Perhaps the FAA can finally move ahead with the much-heralded “next generation” air-traffic-control program known as NextGen.¶ This news makes me recall the mid-1990s, when a visionary FAA staffer named Bruce Holmes–this was back when “visionary” and “FAA” fit in the same sentence–proposed the Small Aircraft Transportation System (SATS). It was meant to exponentially expand general aviation’s role within the U.S., opening up new options for pilots and passengers alike.¶ Aircraft and avionics manufacturers were charged with developing then-revolutionary integrated guidance systems. Pilots would have precise GPS guidance and full access to weather, traffic and terrain-clearance information on large video displays. Digital autopilots would fly with pinpoint accuracy. All this and more has been achieved.¶ In fact, business jet crews already had this level of technology when SATS was proposed. So what would SATS mean for business aviation? That’s where a second element of the plan was to come into play. The original idea called for the FAA to use new technology to redesign the concept of air traffic control, moving away from ground-based radar and navigation beacons and toward solid-state satellite control. In fact, much more of the “control” would be in the cockpit, with pilots having an accurate presentation of the traffic situation on their avionics screens. Ground-based controllers would direct flow, but would no longer be responsible for traffic separation at close quarters.¶ There was talk of a traffic “bubble” around every airplane in the sky–when an aircraft closed in on another’s bubble, the controller could intervene. Otherwise, pilots would be unencumbered by routings that funnel all aircraft through the same bottlenecks and would be free to fly like birds, rather than like rats in a maze. The potential fuel savings of such a system were huge, and that economic edge placed the airlines fully on board, too.¶ The other benefit was in airport final-approach technology based on precise satellite navigation. We now have “Localizer Performance” (LP) approach procedures; and more precise “Localizer Performance Vertical” (LPV) procedures, which include detailed descent guidance. With SATS, even small airports can allow aircraft to take off and land in all but the worst weather, without the need for costly and cumbersome ground-based instrument landing systems (ILS).¶ This is where the true breakout is still expected. If more general aviation aircraft–from heavy business jets to small “air taxis”–can access more airports under more weather conditions, that should enable much greater use of general aviation. Maybe then, the concept of “air taxis”–small jets bypassing large airports by using small airports to pick up passengers and take them to other small airports–can finally gain traction.¶ So, why has this taken so long? Certainly, the lack of a stable FAA budget slowed NextGen implementation. We currently have close to 3,000 LP and LPV approaches in the U.S. That’s more than twice the number of much “higher maintenance” ILS approaches, and new LP and LPV procedures are planned at an increasing pace. The improvements in infrastructure are or will soon be in place. Perhaps now we’re finally on the verge of realizing the dream of Bruce Holmes and his Small Aircraft Transportation System architects.¶ Sometimes, “smaller” leads to bigger and better.

#### Next Gen will decrease the air traffic bubble required between airplanes - will increase efficiency and decrease congestion

The Eno Center 12 [The Eno Center for Transportation is a neutral, non-partisan think-tank that promotes policy innovation and leads professional development in the transportation industry “NextGen: Aligning Costs, Benefits and Political Leadership” <http://www.enotrans.org/wp-content/uploads/wpsc/downloadables/NextGen-paper.pdf>, April 2012] Lin

The current aviation system uses radar to scan through an area periodically and report any nearby operating aircraft to ATC. The lack of continuous precise detection means that planes must maintain a minimum distance of at least three miles between each other for safety. Moreover, airplanes are required to fly through predetermined air corridors like imaginary highways in the air. The precision of GPS would allow reduction in the aircraft separating standard, which greatly enhances air traffic management and flow, and NextGen’s RNAV would allow pilots to choose more direct and shorter routes to their destination. Airline pilots have to rely on the dated radar ATC system for semi-precise information on their location and navigation of other planes in their vicinity. NextGen-cockpit display of traffic information (CDTI) would allow pilots to for the first time know precise location of every aircraft around them and have direct access to the information that was previously only available to ATC. This improves the pilot’s situational awareness and flexibility. NextGen digital data communication between pilots and ATC reduces chances of verbal miscommunication that is quite common in many international airports in the US today. NextGen also allows for OPD, allowing the aircraft to glide prior to landing instead of using additional engine power during the current stepped descending approach.

### Solvency Exts - NextGen solves delays

#### Next Gen solves delays, fuel emissions, and noise - empirics prove

FAA 11 [Federal Aviation Administration, an agency in the DoT, is the national aviation authority of the United States. “Next Gen Implementation Plan” http://www.faa.gov/nextgen/media/ng2011\_implementation\_plan.pdf, March 2011] Lin

As airports and operators reap the benefits of the investments and deployments we are making today, the FAA continues to sharpen its projections of the benefits we expect NextGen to provide during the mid-term. Our latest estimates, which are sensitive to traffic and fuel price forecasts, indicate that by 2018, NextGen will reduce total delays (in flight and on the ground) by about 35 percent compared with what would happen if we did nothing. That delay reduction will provide, through 2018, $23 billion in cumulative benefits to aircraft operators, the traveling public and the FAA. In the process, we will save about 1.4 billion gallons of aviation fuel during this period, reducing carbon dioxide emissions by 14 million tons. The FAA expanded the demonstration activities and trials we use to develop NextGen capabilities, and which provide direct benefits to the members of the aviation community who partner with the FAA to conduct those activities. In Memphis, Tenn., both FedEx and Delta have reported savings from technologies and operational practices aimed at preventing long lines from forming at the end of the runway. Highly specialized Optimized Profile Descents known as Initial Tailored Arrivals have proven so successful, they are moving from demonstration to operational use at airports in San Francisco, Los Angeles and Miami. In addition to helping curb delays, surface management and Initial Tailored Arrivals help the environment by reducing fuel burn and emissions, and offering opportunities to manage noise.

### Solvency Exts - Next Gen Tech solves weather delays

#### Next Gen's interdependent satellite technology increases communication and knowledge for pilots - drastically would decrease weather delays

FAA 07(Federal Aviation Administration, “Fact Sheet – NextGen”, 2/14/07, AD: 07/09/12, <http://www.faa.gov/news/fact_sheets/news_story.cfm?newsid=8145> | Kushal)

NextGen is a wide ranging transformation of the entire national air transportation system — not just certain pieces of it — to meet future demands and avoid gridlock in the sky and in the airports. It moves away from legacy ground based technologies to a new and more dynamic satellite based technology. Technologies and activities that support this transformation are currently part of the FAA’s investment portfolio and represent a step beyond our legacy modernization programs. These new capabilities and the highly interdependent technologies that support them will change the way the system operates, reduce congestion, and improve the passenger experience. This multi-agency initiative is led by the Joint Planning and Development Office. Transformational NextGen Programs ADS-B *Automatic Dependent Surveillance Broadcast* (ADS-B) is, quite simply, the future of air traffic control. As the backbone of the NextGen system, it uses GPS satellite signals to provide air traffic controllers and pilots with much more accurate information that will help keep aircraft safely separated in the sky and on runways. Aircraft transponders receive GPS signals and use them to determine the aircraft’s precise position in the sky, which is combined with other data and broadcast out to other aircraft and air traffic control facilities. When properly equipped with ADS-B, both pilots and controllers will, for the first time, see the same real-time displays of air traffic, substantially improving safety. The FAA will issue a rulemaking that will mandate the avionics necessary for implementing ADS-B across the national airspace system, and will work closely with stakeholders to determine the timeline. The FY08 budget request includes $85 million for ADS-B. Over five years the President’s Budget request totals $564 million for ADS-B. SWIM System Wide Information management (SWIM) provides the infrastructure and services to deliver network-enabled information access across the NextGen air transportation operations. As an early opportunity investment, SWIM will provide high quality, timely data to many users and applications – extending beyond the previous focus on unique, point-to-point interfaces for application-to-application data exchange. By reducing the number and types of interfaces and systems, SWIM will reduce redundancy of information and better facilitate multi-agency information-sharing. SWIM will also enable new modes of decision-making, as information is more easily accessed by all stakeholders affected by operational decisions. The FY08 budget request includes $21.3 million for SWIM. Over five years the President’s Budget request totals $173 million for SWIM. NextGen Data Communications NextGen transformation cannot be realized through today’s voice-only communications. This is particularly true in the areas of aircraft trajectory-based on operations, net-centric and net-enabled information access. Initially, data communication provides an additional means for two-way exchange between controllers and flight crews for air traffic control clearances, instructions, advisories, flight crew requests and reports. With 70 percent of aircraft data-link equipped, allowing for the exchange of routine controller-pilot messages and clearances via data can enable controllers to safely handle more traffic. This improves air traffic controller productivity, enhances capacity and safety. The FY08 budget request includes $7.4 million for NextGen Data Communications. Over five years the President’s Budget request totals $126 million for NextGen Data Communications. NextGen Network Enabled Weather Seventy percent of NAS delays are attributed to weather every year. The goal of this investment (combined with the other technologies outlined here) is to cut weather-related delays at least in half. The NextGen Network Enabled Weather (NNEW) will serve as the core of the NextGen weather support services and provide a common weather picture across the national airspace system. These services will, in turn, be integrated into other key components of NextGen required to enable better air transportation decision-making. It is anticipated that tens of thousands of global weather observations and sensor reports from ground-, airborne-, and space-based sources would fuse into a single national weather information system, updated as needed in real-time. The FY08 budget request includes $7 million for NextGen Network Enabled Weather. Over five years the President’s Budget request totals $102 million for NextGen Network Enabled Weather. NAS Voice Switch Today there are 17 different baselines of voice switches in the NAS with some of them in the inventory more than 20 years. The NAS Voice Switch (NVS) will replace these switches and provide the foundation for all air/ground and ground/ground voice communications in the future air traffic control environment. The FY08 budget request includes $3 million for the NAS Voice Switch. Over five years the President’s Budget request totals $157 million for NAS Voice Switch. NextGen Demonstrations and Infrastructure Development At this early stage of NextGen, it is critical to better define operational concepts and the technologies that will support them. For the first time, in FY08, FAA is requesting funding for these defining activities. This funding will support two demonstrations and a series of infrastructure development activities. The primary purpose is to refine aspects of the trajectory-based operations concept. The FY08 budget request includes $50 million for NextGen demonstrations and infrastructure development. Over five years the President’s Budget request totals $170 million for NextGen Demonstrations and Infrastructure Development. The Benefits of NextGen Trajectory Based Operations In the future, many pilots and dispatchers will be able to select their own flight paths, rather than follow the existing interstate-like grid in the sky. What enables this is information. In the high performance airspace of the future, each airplane will transmit and receive precise information about the time at which it and others will cross key points along their paths. Pilots and air traffic managers on the ground will have the same precise information, transmitted via data communications. Our investments in ADS-B, SWIM, and Data Communications are critical to trajectory based operations. Collaborative Air Traffic Management Major demand and capacity imbalances will be worked collaboratively between the FAA air traffic managers and flight operators. The increased scope, volume and widespread distribution of information that SWIM provides will improve the quality of the decisions and let more operators participate. Reduce Weather Impacts With NextGen, the impact of weather is reduced through the use of improved information sharing, new technology to sense and mitigate the impacts of weather, improved weather forecasts, and the integration of weather into automation to improve decision-making. Better forecasts, coupled with new automation, will minimize airspace limitations and traffic restrictions. High Density Airports When it comes to the airspace around the Nation’s busiest airports (Chicago, New York, Dallas/Fort Worth, Los Angeles), NextGen will provide capabilities beyond those in other areas. New procedures will improve airport surface movements, reduce spacing and separation requirements, and better manage the overall flows into and out of busy metropolitan airspace to provide maximum use of the highest demand airports. Flexible Terminals and Airports Focusing all resources on the largest, most complex airports would fail to uncover untapped capacity in the system, and that’s what this initiative is about. During busy traffic periods, NextGen will rely on the ability of aircraft to fly precise routes into and out of many airports to increase throughput. Why Now Without NextGen there will be gridlock in the skies. By 2022, we estimate that this failure would cost the U.S. economy $22 billion annually in lost economic activity. That number grows to over $40 billion by 2033 if we don’t act. Even as early as 2015 our simulation shows that without some of the initial elements of NextGen we will experience delays far greater than what we are seeing today.

#### Next Gen technology key to solving weather delays - it can handle the tripling of capacity that is coming

Tumer et al 07 (Kagan, and Adrian Agogino. Professor, Robotics and Control [Oregon State University](http://oregonstate.edu/),  PhD in [Electrical and Computer Engineering,](http://www.ece.utexas.edu/) from [The University of Texas](http://www.utexas.edu/), 97-06 was a senior research scientist in the [Intelligent Systems Division,](http://ic.arc.nasa.gov/) NASA Ames Research Center. *Proceedings of the Sixth International Joint Conference on Autonomous Agents and Multiagent Systems 2007, AAMAS '07: Honolulu, Hawaii, May 14 - 18, 2007*. Red Hook, NY: Curran, 2007. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.90.7793&rep=rep1&type=pdf)

The efficient, safe and reliable management of our ever increasing air traffic is one of the fundamental challenges facing the aerospace industry today. On a typical day, more than 40,000 commercial flights operate within the US airspace [14]. In order to efficiently and safely route this air traffic, current traffic flow control relies on a centralized, hierarchical routing strategy that performs flow projections ranging from one to six hours. As a consequence, the system is slow to respond to developing weather or airport conditions leading potentially minor local delays to cascade into large regional congestions. In 2005, weather, routing decisions and airport conditions caused 437,667 delays, accounting for 322,272 hours of delays. The total cost of these delays was estimated to exceed three billion dollars by industry [7]. Furthermore, as the traffic flow increases, the current procedures increase the load on the system, the airports, and the air traffic controllers (more aircraft per region) without providing any of them with means to shape the traffic patterns beyond minor reroutes. The Next Generation Air Transportation Systems (NGATS) initiative aims to address this issues and, not only account for a threefold increase in traffic, but also for the increasing heterogeneity of aircraft and decreasing restrictions on flight paths. Unlike many other flow problems where the increasing traffic is to some extent absorbed by improved hardware (e.g., more servers with larger memories and faster CPUs for internet routing) the air traffic domain needs to find mainly algorithmic solutions, as the infrastructure (e.g., number of the airports) will not change significantly to impact the flow problem. There is therefore a strong need to explore new, distributed and adaptive solutions to the air flow control problem.

### Solvency Exts - Plan spurs international cooperation

#### Stable funding key to EU cooperation – solves best for trans-Atlantic flights

Perera 11 [David Pererais executive editor of the FierceMarkets Government Group. He has reported on all things federal since January 2004. In addition to his Fierce work, he is also at work on a book to be published in September 2012 on the federal information technology market. “NextGen budget cuts hurt EU collaboration, says GAO”,http://www.fiercegovernmentit.com/story/nextgen-budget-cuts-hurt-eu-collaboration-says-gao/2011-11-29, 11-30-2011] Lin

Budget cuts to the Federal Aviation Administration's multi-year air traffic control modernization effort could have the effect of making coordination with European counterparts more difficult, warns the Government Accountability Office. The FAA effort, known as NextGen, is an at least $40 billion collection of programs meant to revamp air traffic control by replacing radar with Global Positioning Satellite tracking, permitting the national airspace system to accommodate up to three times more air traffic than currently possible while reducing airplane fuel consumption and emissions through increased air traffic efficiency. The European Union has embarked on a similar effort called the Single European Sky ATM Research, or SESAR. As the GAO notes, a lack of interoperability between NextGen and SESAR technology standards could end up forcing planes on trans-Atlantic routes to have two sets of avionics and two different operating procedures--a situation that would degrade safety. The FAA and European Union signed a memorandum of cooperation in March 2011 establishing a formal collaborative structure for NextGen and SESAR, but any NextGen spending cuts caused by a reduction in congressional appropriations take precedence over deadlines agreed to even in the context of the formal structure, FAA officials told auditors. For example, FAA officials said the agency is restructuring plans to implement a ground-based augmentation system because of a potential funding reduction, even as Europeans press forward with it. GBAS augments the accuracy of GPS signals. As a result, "SESAR may have an operational GBAS while FAA does not," auditors say. FAA and European officials also told auditors cuts in their travel budget will make working with European counterparts more difficult despite the use of remote meeting tools such as WebEx, possibly resulting in schedule delays on joint projects.

### AT: SQ Solves - Retrofitting

#### Status quo attempts at decreasing jet fuel emissions are failing - retrofitting will not cause a significant decline

Fleming 8 (Aviation and Climate Change: Aircraft Emissions Expected to Grow, but Technological and Operational Improvements and Government Policies Can Help Control Emissions June 8, 2009 Statement of Susan Fleming, Director, Physical Infrastructure Issues. June 8, 2009 This is a GAO report. LexisNexis.) foster

Retrofits such as winglets--wing extensions that reduce drag-- can be made to aircraft to make them more aerodynamic but may have limited potential for future emissions reductions according to experts we surveyed. By improving airflow around wings, winglets reduce drag and improve fuel efficiency, thus reducing emissions by a modest amount. Boeing estimates that the use of winglets on a 737 reduces fuel burn by 3.5 percent to 4 percent on trips of over 1,000 nautical miles. Many new aircraft can be purchased with winglets, and existing aircraft also can be retrofitted with them. However winglets have already become very common on U.S. commercial airline aircraft and provide limited benefit for short-haul flights. According to experts we surveyed, there is low potential for future fuel consumption and emissions reductions from winglets.

### Topicality Helpers - We are Transportation Infrastructure

#### We meet - Next Gen is transportation infrastructure

Dave Hess 11,http://articles.courant.com/2011-09-27/news/hc-op-hess-nextgen-0927-20110927\_1\_air-traffic-radar-air-routes,Modern Air Control Vital To Economy, Jobs, 9/27/11, editor at the Hartford Courant jeong

Unfortunately, I don't think most Americans know what NextGen is. We tend to focus on roads, rail and ports when we talk about transportation infrastructure. Yet, in a world increasingly dependent on international commerce and coast-to-coast travel, speedy, reliable air transportation is just as important. And as safe as air travel is right now, the NextGen overhaul will make it even safer, more efficient and more environmentally friendly.¶ It's almost unbelievable, but 50,000 flights a day in the U.S. are controlled much the same as they were in 1960 — by World War II-era ground radar stations.

### Topicality Helpers - We are infrastructure

#### Next Gen is infrastructure

Mark,Phelps,12, [http://www.bjtonline.com/business-jet-news/why-%E2%80%98nextgen%E2%80%99-matters,”Why ‘NextGen’ matters “,4/20/12,writer and editorial consultant for numerous aviation news and magazines.] Jeong

The congressional logjam blocking long-term FAA funding in the U.S. appears to be broken. Perhaps the FAA can finally move ahead with the much-heralded “next generation” air-traffic-control program known as NextGen.¶ This news makes me recall the mid-1990s, when a visionary FAA staffer named Bruce Holmes–this was back when “visionary” and “FAA” fit in the same sentence–proposed the Small Aircraft Transportation System (SATS). It was meant to exponentially expand general aviation’s role within the U.S., opening up new options for pilots and passengers alike.¶ Aircraft and avionics manufacturers were charged with developing then-revolutionary integrated guidance systems. Pilots would have precise GPS guidance and full access to weather, traffic and terrain-clearance information on large video displays. Digital autopilots would fly with pinpoint accuracy. All this and more has been achieved.¶ In fact, business jet crews already had this level of technology when SATS was proposed. So what would SATS mean for business aviation? That’s where a second element of the plan was to come into play. The original idea called for the FAA to use new technology to redesign the concept of air traffic control, moving away from ground-based radar and navigation beacons and toward solid-state satellite control. In fact, much more of the “control” would be in the cockpit, with pilots having an accurate presentation of the traffic situation on their avionics screens. Ground-based controllers would direct flow, but would no longer be responsible for traffic separation at close quarters.¶ There was talk of a traffic “bubble” around every airplane in the sky–when an aircraft closed in on another’s bubble, the controller could intervene. Otherwise, pilots would be unencumbered by routings that funnel all aircraft through the same bottlenecks and would be free to fly like birds, rather than like rats in a maze. The potential fuel savings of such a system were huge, and that economic edge placed the airlines fully on board, too.¶ The other benefit was in airport final-approach technology based on precise satellite navigation. We now have “Localizer Performance” (LP) approach procedures; and more precise “Localizer Performance Vertical” (LPV) procedures, which include detailed descent guidance. With SATS, even small airports can allow aircraft to take off and land in all but the worst weather, without the need for costly and cumbersome ground-based instrument landing systems (ILS).¶ This is where the true breakout is still expected. If more general aviation aircraft–from heavy business jets to small “air taxis”–can access more airports under more weather conditions, that should enable much greater use of general aviation. Maybe then, the concept of “air taxis”–small jets bypassing large airports by using small airports to pick up passengers and take them to other small airports–can finally gain traction.¶ So, why has this taken so long? Certainly, the lack of a stable FAA budget slowed NextGen implementation. We currently have close to 3,000 LP and LPV approaches in the U.S. That’s more than twice the number of much “higher maintenance” ILS approaches, and new LP and LPV procedures are planned at an increasing pace. The improvements in infrastructure are or will soon be in place. Perhaps now we’re finally on the verge of realizing the dream of Bruce Holmes and his Small Aircraft Transportation System architects.¶ Sometimes, “smaller” leads to bigger and better.

### Obama Helpers - Plan is a compromise

#### Turn - Congress empirically compromises over FAA funding

Lengell 2012 [staff writer, "Congress approves long-term FAA funding bill", February 06, http://www.washingtontimes.com/news/2012/feb/6/congress-approves-long-term-faa-funding-bill/?page=all] ttate

After more than four years of delays and almost two-dozen stopgap extensions, Congress on Monday approved a long-term Federal Aviation Administration funding bill that will lead to major upgrades of the nation’s decades-old air traffic control system and other safety measures.

Senate Commerce, Science and Transportation Committee Chairman John D. Rockefeller IV called the bipartisan compromise “the best news that the airline industry ever had.”

### Obama Helpers - Lawmakers love the plan

#### Plan popular - lawmakers and lobbies love the plan

USA Today 9 [“Ticket taxes get diverted to fund tiny airfields”; USA Today, September 24, ProQuest] ttate

Every frequent flier knows how irritating air travel can be these days: long lines, cramped seats, extra fees for just about everything, and assorted government charges that drive up the cost of a typical $250 roundtrip ticket by 16%. What most passengers don't realize,however, is that a wildly disproportionate amount of taxes they're paying for airport improvements goes to more than 2,800 fields across the USA that they'll never use. Unless, of course, they fly on the private planes that these small fields serve. Since the Airport Improvement Program began in 1982, $15 billion -- about a third of the money collected for the program -- has gone to the smaller airfields with no scheduled passenger flights, according to a USA TODAY analysis published last week. By contrast, the nation's 30 largest airports, which enplaned more than 500 million passengers last year alone, got about $13 billion. How to explain such a senseless allocation of taxes? It's the same two words responsible for earmarks and other political distortions: Congress and lobbying. At the start of this decade, Congress reworked the airport program to steer more money to the 2,834 smaller fields, which handle only "general aviation." How it happened is easy to understand. Private pilots with their own planes, and corporations that own jets, make up one of the most formidable lobbies in Washington. Just about every lawmaker has scores of pilots in his district, and many lawmakers have been frequent fliers on private planes. From 2001 to 2006, lawmakers took 2,154 trips on corporate jets, according to a study by PolitcalMoneyLine, an independent research group. This flow of forced largesse from commercial air passengers brings business and services to small towns and helps connect rural areas with the rest of the country. Some small airports help relieve congestion at nearby bigger airports. But it would be hard to find fliers who wouldn't rather keep their money or see it spent to improve the airports they use. Besides, USA TODAY's analysis found that half of the small fields are within 20 miles of another private-aviation airport, making many redundant. And in seven states analyzed, 90% of the private-aviation airports operate at less than one-third capacity. For example, the Williamsburg-Whitley County Airport in Kentucky -- built with $11 million in federal funds and boasting a 5,500-foot lighted runway and colonial-style terminal -- sees just two or three flights a day. The powerful groups that represent private pilots (the Aircraft Owners and Pilots Association has been dubbed "the NRA of the air") argue that commercial airports have other sources of federal funds, which they do, and that the nation's small airfields are akin to the nation's highway and road system, which is just silly. Virtually everyone in the nation drives a car, rides in cars or buses as a passenger, or benefits from products moved on the nation's highways. That's not the case with private-aviation airfields, where projects are financed mostly by taxes on passengers who never set foot in them. We don't argue that this network is unnecessary. The Airport Improvement Program, however, wasn't intended to be a piggy bank for the small-plane lobby. Air passengers shouldn't have their pockets picked to fund an extravagance that benefits a select few.

### Obama Helpers - Aviation lobby

#### Plan popular - aviation lobbies support Next Gen

Aviation International News 9 ["Aviation lobby groups urge: include Next Gen in stimulus", January 27, http://www.ainonline.com/aviation-news/aviation-international-news/2009-01-27/aviation-lobby-groups-urge-include-nextgen-stimulus] ttate

In a rare show of unanimity, the Air Transport Association has joined with general aviation and others in lobbying Congress for a $4 billion stimulus package that could jumpstart NextGen and provide many of its benefits during President Barack Obama’s first term. A coalition of 11 aviation-related organizations said that under the FAA’s current plan, NextGen will not achieve significant investment return for the aviation transportation system until 2025. Included in the group are NBAA, the National Air Transportation Association, AOPA and the General Aviation Manufacturers Association. “This is due, in large part, to the challenge of aligning investments in air and ground infrastructure and across the stakeholders–the ‘chicken and egg’ syndrome,” the groups said. “An infusion of stimulus funding would jumpstart this process, dramatically advancing the schedule and resulting in job creation, a reduction in carbon emissions and an air transportation system supporting economic growth.” Under the stimulus proposal, the $4 billion would be used to make grants for 100 percent of the costs to retrofit general aviation and commercial aircraft with NextGen equipment such as on-board avionics, electronic flight bags, cockpit displays, surface moving maps and software upgrades. The groups explained that combining the FAA’s infrastructure modernization with enhanced aircraft equipage and new procedures will create jobs; improve airline environmental performance and reduce CO2; enhance system capacity/operational performance, leading to reduced delays for consumers; reduce FAA operating costs; and establish all-weather access to general aviation airports. Using the FAA’s own methodology for calculating jobs created, the coalition estimated that a $4 billion funding infusion for NextGen would generate 77,000 jobs. Experts estimate that total NextGen implementation will cost $20 billion for FAA program development, deployment and technology acquisition and $20 billion for operators for avionics equipage, training and related costs. “In fact, we anticipate that the FAA will be requesting stimulus funding to accelerate its NextGen infrastructure needs as well as funds to accelerate the needed standards, procedures and criteria that will be required for aircraft to take advantage of the full benefits from equipage,” the coalition said. “Thus, our proposal for stimulus funding should dovetail well with FAA’s NextGen request.” The components of the request total $4.048 billion. Of that, $2.2 billion is for ADS-B, $500 million for RNP equipage, $20 million for FAA Rnav/RNP procedure development, $500 million for LPV procedures development, $458 million for electronic display upgrades and $370 million for ground-based augmentation systems to support precision landings. The coalition is making the request on behalf of the commercial and GA communities. Although $4 billion is only a fraction of the estimated total of $20 billion in required equipage costs, it will provide a sufficient jumpstart to “significantly accelerate these programs and their benefits,” the group added. In early December, many of the same associations sent a joint letter to the House and Senate leadership recommending six priorities for Congress to consider when assembling an economic stimulus package, including funding for airports, investment in NextGen, an emphasis on research and development, legislation to extend accelerated depreciation on aircraft purchases and other initiatives. That 12-member coalition strongly recommended that the following proposals be included in the economic stimulus package: include at least $1 billion for the Airport Improvement Program (AIP); fund $3 billion for NextGen equipage; eliminate the Alternative Minimum Tax penalty on airport private activity bonds; extend the current bonus depreciation provision for aircraft purchases through Dec. 31, 2009, and the placed-in-service date through Dec. 31, 2011; accelerate the increases in the domestic manufacturing deduction; and make the R&D tax credit permanent.

### Elections Helpers - Plan popular - Airport funding

#### Public supports funding airports

Berger 2008 [John - president of Venice Airport Coalition, "The VASI Angle", April 23, http://www.veniceaviationsociety.com/archive/NewsLetters/VASIAngleJuneJuly08.pdf] ttate

Yesterday was earth day. Today we watched another half dozen private jets depart Venice airport, consuming thousands of gallons of fuel, polluting the air and contributing to global warming. These airplanes now fill the skies in Florida, and concerns expressed to the FAA requesting a better prioritization of our resources have gone unanswered. On the State level, millions of dollars of FDOT funding is directed to subsidize 80% of the cost of private airplane hangars at general aviation airports. On behalf of Venice Neighborhoods Coalition, I am writing to ask that you make an earnest examination of the massive public support given to general aviation airports and look into how these funds may be better spent supporting commercial aviation that truly assist the public in its transportation needs. We feel that special interests should pay their own way, and we believe the Federal “Use Tax” proposal, which would assist general aviation to pay its own way would be beneficial in this respect. We also feel that the massive FDOT contributions to General Aviation should be reconsidered. Our organization sees massive airport improvement grants to GA airports (and ours in particular) as a subsidy for private flight schools, wealthy corporate jet owners, and special interests. I would like to make this case to you by providing, as an example, the airport we know well.

### Elections Helpers - Plan helps Obama - Jobs

#### Economy will be the focus in November - plan will be spun as a job stimulus - will swing the win towards Obama

Weinberg 2012 [Chris - staff writer for ESSA, March 25, <http://economicstudents.com/2012/03/obamas-moment/>] ttate

Whilst the economic recovery had begun to take hold (as reflected in improved GDP figures), the unemployment rate had not appreciably fallen over the course of Obama’s term, stubbornly stuck (for the Obama White House and the American worker), above 9% for the bulk of 2010 and flat-lining in the mid 8’s as debt and deficit reduction under the new Republican House majority dominated the conversation in 2011. However, when the Labor Department announced that American unemployment had dropped 0.2% over January, a gain of 243,000 jobs, the conventional wisdom of a President burdened by the millstone of pervasive and deep-seated unemployment began to dissipate. Whilst no President since Franklin Roosevelt has won re-election with an unemployment rate stuck above 8%, the general consensus is that an Obama re-election is more than a 50/50 chance, provided the monthly change in added jobs continues to remain in the vicinity of 250,000. As Nate Silver in The New York Times noted, President Ronald Reagan won re-election in 1984 with unemployment at 7.4%, after plummeting from 9.5% the year before. Such is Obama’s challenge; whilst the numbers are not ideal presently, if the economy can give the impression of making significant, steady gains in employment over the next 8 months, the perception for the American voter will be one of an American comeback; and with that would come a likely re-election of the President. Whether this period is looked back on as the moment when Obama’s re-election went from being potentially hazardous to a near certainty depends on the trend of the unemployment rate for the rest of 2012. The biggest factor in determining this trend will be whether the long-term unemployed, currently out of the labour force, decide to re-enter the market and look for a job in an atmosphere of improved hiring conditions; thus placing upward pressure on the unemployment rate. This dynamic coupled with the impending cuts in the federal budget and the unemployment rates in various swing states could be the difference for this President as he seeks to secure a successful legacy, entirely predicated on his re-election.

### Federalism DA Helpers - Plan is federal jurisdiction

#### No link - aviation infrastructure is the responsibility of the federal government

NASAO 12 [National Association of State Aviation - one of the most senior aviation organizations in the United States, "NASAO National Legislative Agenda",

http://www.nasao.org/Advocacy/NASAOAgenda.aspx] ttate

NASAO fully recognizes the importance of national deficit reduction, but notes thatthe Airport Improvement Program (AIP) and its associated Aviation Trust Fund have always been the recipients of a series of dedicated federal excise taxes, paid by aviation users. AIP and its trust fund should not be viewed as a potential source of deficit reduction funds**.** To do so will inevitably lead toa decrease in safety, an unacceptable reduction in the current pace of NextGen implementation, and a decrease in efficiency resulting in increased airline delays. NASAO firmly believes that our national aviation infrastructure has always been and should always be a federal responsibility**.** While the states are ready and willing to assist, as they always have, the leadership of financing our national aviation system rightly rests with the Administration, Congress, the U.S. Department of Transportation and the Federal Aviation Administration (FAA).

### States CP Helpers - Federal Funding Key

#### Federal funding key to jumpstarting reciprocal state funding

Cohen 2002 [Jeffrey - association professor of economics @ University of Maryland, "Reciprocal State and Local Airport Spending Spillovers and Symmetric Responses to Cuts and Increases in Federal Airport Grants", January, SAGE] ttate

Recently, the U.S. Congress has debated whether to reauthorize funding for the Federal Aviation Administration’s (FAA’s) intergovernmental grants program, the Airport Improvement Program (AIP). This debate has been revived on more than one occasion over the past several years, bringing to the forefront the importance of examining the state and local airport spending responses to changes in AIP grants. Furthermore, the value of AIP cash outlays awarded in individual states has varied over the course of the AIP. Although in some years total AIP cash outlays to some states have risen, total AIP cash outlays to other states have fallen at the same time. Similarly, for many states, there is individual variability over time in total AIP cash outlays awarded in the sense that in some years, total AIP cash outlays to a given state rise, whereas in other years, total AIP cash outlays fall. This variability is demonstrated for a selection of states in Table 1. The variability in the AIP grants also leads to the question of whether states and localities exhibit symmetric spending responses to both increases and decreases in these grants.

There is an extensive literature on the effects of changes in intergovernmental grants on spending responses of state and local governments receiving federal aid. The public finance literature has shown that in general, an increase in lump-sum intergovernmental grants to a state or locality should lead to an expenditure response by the recipient government equivalent to that from a lump-sum increase in income of the median voter (Bradford and Oates 1971).The theory similarly predicts a symmetric response in state and local spending for a decrease in intergovernmental grants.

For the most part, the empirical evidence has not supported this theory. Many studies (discussed by Gramlich 1977) have found that increases in various types of intergovernmental grants to states and localities have led to spending increases somewhat greater than the marginal propensity to spend out of an increase in private income. This phenomenon has been described as the flypaper effect because these empirical results have implied that the grant money “sticks where it hits.” There have been many attempts to explain such empirical findings, including criticisms of econometric specifications and allegations of the presence of price effects arising due to the matching rates present in some grants programs.

How states and localities respond to general forms of diminished federal aid has become a question of increasing interest (see Quigley and Rubinfeld 1996 for a discussion of this issue). A more recent empirical literature has examined the spending responses of states and localities to cuts in intergovernmental grants. Overall, the empirical evidence is mixed as to whether states and localities exhibit symmetric expenditure responses to both cuts and increases in grants. Furthermore, when asymmetric spending responses are found, there is the ad- ditional question of whether states and localities pick up the slack and spend more in response to cuts in intergovernmental grants (fiscal replacement) or spend less in response to cuts in intergovernmental grant receipts (fiscal restraint). Stine (1994) studied 66 Pennsylvania county governments and found that own-source revenue fell in response to a cut in aid from the federal government. But county spending rose in response to decreases in grants from state governments. Gamkhar and Oates (1996) used aggregate time series data for state and local expenditures and found symmetric state expenditure response to cuts and increases in grants.

Volden (1999) studied the asymmetry question by analyzing specific data on state welfare expenditures. He found that when the state matching level rose (implying a cut in welfare grants to the states), states did not change their welfare payments. But when the matching level fell, states increased their welfare payments.

Gamkhar (2000) examined asymmetries related to federal highway grants. She found that cuts in grants resulted in an asymmetric highway spending response by state and local governments in the period the cut occurred. States and localities spent less on highways at the time of the cut, whereas the contemporaneous effect on highway spending of an increase in grants was insignificant. But she did find a symmetric highway spending response to changes in lagged highway obligations.

It is postulated here that AIP grants from the federal government are an important determinant of state and local airport spending. It is also reasonable to postulate that airport spending in a particular state depends not only on its own economic variables (such as grants from the federal government and disposable income) but on the level of airport spending in other states. The theory elaborating on the possibility of individuals’ receiving benefits from public spending in other states can be traced back to Oates (1972). In the present case, this seems plausible due to the “hub and spoke” (Morrison and Winston 1985) structure of the U.S. air transportation system. Namely, cross-country passengers may fly from a spoke in a state in one end of the country to a central hub in another state, change planes, and fly on to a state in the other end of the country. Often, passengers wait in an airport in a particular state for a plane that has been delayed on its previous leg due to congestion at an airport in another state. A delay resulting from congestion at one node in the air transportation system often results in further delays for connecting passengers throughout the entire system. Thus, spending increases at airports that are proverbially riddled with time delays confer spillover benefits on individuals in other states who travel through the airport in question. These benefits are in the form of travel time savings. This could make it socially optimal for an individual state to increase its airport spending when other states spend more on airports. Moreover, these benefits are reciprocal in nature as described by Oates (1972). It will be important to incorporate this potential interdependency into an empirical framework that examines asymmetric state and local airport expenditure responses to changes in AIP grants.

### States CP Answers - Federal jurisdiction

#### Aviation and airports are under federal government's jurisdiction - makes pre-emption possible

Erbsen 2011 [Allan - associate professor @ University of Minnesota Law School, "Constitutional Spaces", *Minnesota Law Review*, papers.ssrn.com/sol3/papers.cfm?abstract\_id=1785546] ttate

First, consider the air above the United States. The air is essentially a modern analogue to admiralty jurisdiction—a channel of transportation and commerce shared by actors moving between multiple jurisdictions under circumstances requiring uniform rules. But unlike admiralty, the Constitution never mentions the air (which is unsurprising given that air travel was not viable in 1789). Thinking about air as a space within the constitutional framework raises at least three interesting questions about how air overlaps with other spaces. First, is the air above a state also within that state? Courts have uncritically assumed that states have territorial control over their airspace in cases where states tried to exercise personal jurisdiction over defendants served on airplanes.338 Yet state jurisdiction must end somewhere. For example, it does not extend to orbiting satellites.339 So there may be an altitude beyond which the fiction of territorial jurisdiction evaporates.340 Second, even if state territory extends vertically, there is a question about whether Congress and the federal judiciary have the same legislative and common law authority over the air that they have over admiralty. The air is a channel of commerce in which Congress can preempt state law,341 and over which Congress has claimed “exclusive” national “sovereignty.”342 However, it is not clear that dormant federal preemption over navigable airspace is as strong as dormant preemption over navigable waters, and thus the role of federal common law is uncertain.343 Third, the mirror image of the question about whether state power over land encompasses some of the appurtenant air is whether federal power over air encompasses some of the appurtenant land. This question arises because air travel requires airports, and thus federal power over airspace may extend to the lands that planes use to access this space.344 The extent of federal power over land as an incident to its power over the air remains an open question.345 The air thus hovers above us as an unenumerated space in the “public domain” lacking “precise limits” and a clear legal status.346

### Privatization CP Answers - Industry skepticism

#### CP fails to get industry on board - termination of FAA creates industry skepticism

Dillingham 2011 [Gerald L - director of Physical Infrastructure Issues, "FAA has made some pregress in implementation, but delays threaten to impact costs and benefits", Testimony before the Subcommittee on Aviation, Committee on Transportation and Infrastructure - House of Representatives, October 05, www.gao.gov/products/GAO-12-141T]

To maintain credibility with aircraft operators that NextGen will be implemented, FAA must deliver systems and capabilities on time so that operators have incentives to invest in the avionics that will enable NextGen to operate as planned. As we have previously reported, a past FAA program’s cancellation contributed to skepticism about FAA’s commitment to follow through with its plans. That industry skepticism, which we have found lingers today, could delay the time when significant NextGen benefits—such as increased capacity and more direct, fuelsaving routing—are realized. A number of NextGen benefits depend upon having a critical mass of properly equipped aircraft. Reaching that critical mass is a significant challenge because the first aircraft operators to equip will not obtain a return on their investment until many other operators also equip.

### Privatization CP Answers - Fails - Other countries prove

#### Privatization for airline industry fails - can't implement new technologies - other countries prove

Sclar 2003 [Elliott - director of graduate programs in Urban Planning @ Colombia,

"Pitfalls of Air Traffic Control Privatization" *National Air Traffic Controllers Association*, “Pitfalls of Air Traffic Control Privatization,” National Air Traffic Controllers Association, http://www.inthepublicinterest.org/sites/default/files/PitfallsofATCPrivatization.pdf]

A second claim of privatization advocates is that public bureaucracies have a poor record of providing modern technology and that private ATC systems would be innovative and speedy adapters of new technology. The Canadian, Australian, and British cases all demonstrate that this is in fact not the case. Technological “innovation” in Canada has consisted of waiting for the U.S. to develop new technology and then importing it. Cases where private ATC providers have attempted to hastily implement novel technology in response to “incentives” are even more disconcerting. In Australia, implementation of Airservices Australia’s, The Australian Advanced Air Traffic System (TAAATS) has led to several technological failures, including a twelveminute radar blackout.9In the United Kingdom, introduction of new software has caused severe disruptions and system shutdowns.10Controllers in a new London area facility have been unable to make out the call numbers of planes on their new Sony screens, which is a major safety hazard. Anecdotal evidence from newspaper reports has suggested major inefficiency and safety hazards associated with private implementation of new technology in this vital piece of national infrastructure. Far from supporting the argument that privatization brings better technology quicker, international cases demonstrate a substantial risk of technological failure.