

# NextGen Equipage Fund

*Job Creation, Economic Benefits, and  
Contribution to Federal Revenues*

---



**NEXA** Advisors  
A NEXA Capital Company

April 2011

**Contents**

Executive Summary..... 3

Background ..... 5

Job Creation ..... 6

Economic Benefits..... 7

    Direct Economic Benefits ..... 7

    Indirect Economic Benefits ..... 8

    Induced Economic Benefits..... 9

    Catalytic Economic Benefits..... 10

*Catalytic Benefits: Consumer* ..... 12

*Catalytic Benefits: Environmental* ..... 12

*Catalytic Benefits: Tourism and Trade* ..... 12

*Catalytic Benefits: Investment* ..... 12

*Catalytic Benefits: International Competitiveness* ..... 13

*Catalytic Benefits: Multiplier Impact*..... 13

Federal Revenue Contribution ..... 13

Conclusions ..... 14

About NEXA Advisors ..... 15

Data Appendix..... 16

Reference List and Relevant Studies..... 17

Endnotes ..... 19

## Executive Summary

In an important recent study, “*The Economic Impact of Civil Aviation on the U.S. Economy*”<sup>i</sup>, the Federal Aviation Administration (FAA) estimated that civil aviation accounted for 12 million U.S. jobs and \$1.3 trillion in economic activity annually. FAA also estimated that implementing the Next Generation Air Transportation System (“NextGen”) infrastructure and procedures through 2018 would reduce total flight delays by 21 percent and provide \$22 billion in cumulative direct, indirect, and induced benefits<sup>ii</sup>.

The NextGen Equipage Fund, LLC (the “NextGen Fund” or the “Fund”) has been established for the purpose of facilitating the rollout of the avionics side of NextGen for U.S. commercial aircraft operators. It will provide affordable financing to equip U.S. commercial aircraft with hardware and software systems needed to make use of NextGen ground infrastructure. The NextGen Fund removes the barriers that have continued to impede the air carrier equipage decisions needed to ensure the successful, rapid implementation of the nation’s NextGen program.

In this supplemental study, NEXA Advisors estimates that by overcoming airline barriers to equipage, the NextGen Fund can provide significant near term economic benefits beginning in 2013, accounting for as much as 32 percent of the FAA’s estimated benefits from accelerated implementation of NextGen through 2018. These

estimates include creating up to 31,480 U.S. jobs, \$6.9 billion in direct, indirect and induced economic activity, and up to \$23.5 billion in total economic activity when catalytic effects are counted (Figure 1). This total economic activity would also drive an estimated \$4.7 billion in new Federal revenue contributions.

Economic impact is calculated by NEXA Advisors using a widely accepted input-output method of economic modeling of direct, indirect, induced, and catalytic benefits to the U.S. economy.

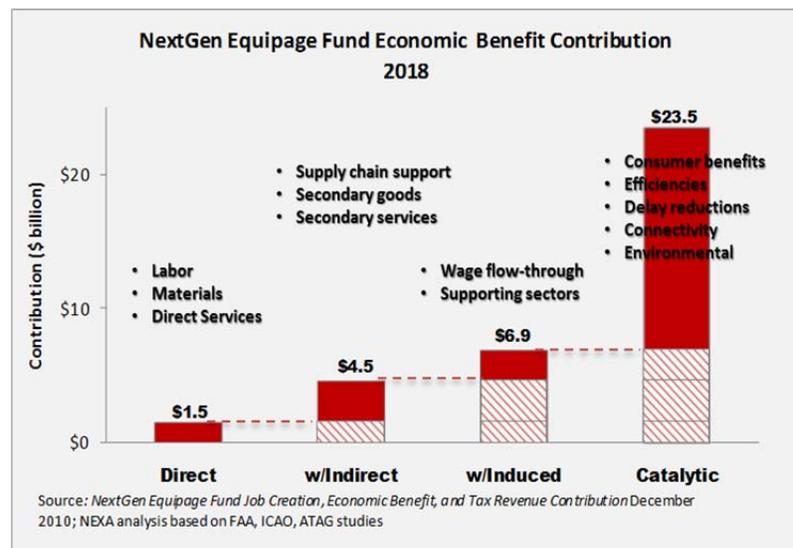


Figure 1

The direct economic impacts result from direct Fund expenditures into the U.S. supply chain. These expenditures will purchase NextGen avionics hardware and software, almost exclusively from U.S. suppliers, also paying for up front installation of the equipment on thousands of U.S. aircraft. The indirect economic impacts are those stimulated economic activities of the supply chain itself, hiring workers, purchasing second tier components, and completing installation of the NextGen avionics. The induced benefits are the ripple effects of spending that creates economic activity throughout the aviation industry and spilling into other industries. Catalytic impacts capture the extent to which aircraft equipage stimulates growth in air transport, thereby accelerating growth of other sectors of the

economy. This effect includes passenger benefits from more reliable air travel and environmental benefits as NextGen reduces emissions, noise, and congestion around airports. Catalytic economic benefits are in addition to the direct, indirect, and induced benefits of the fund.

U.S. jobs are directly created through the NextGen Fund’s purchases of avionics from manufacturers, and the installation and support of the equipment (Figure 2). These jobs include engineers, software developers, production workers and other high-tech specialists needed to support the development and manufacture of the NextGen technologies. In addition, highly skilled installation and maintenance jobs will be created to install and support the equipment on aircraft.

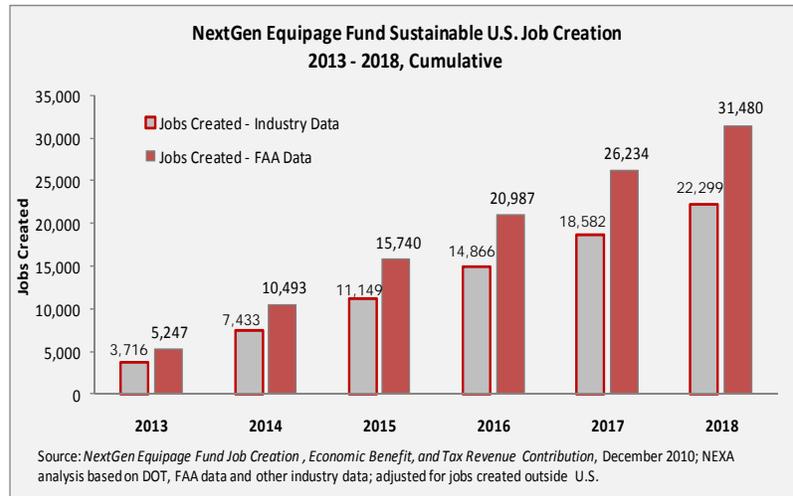


Figure 2

In addition to jobs and economic benefits, the NextGen Fund will make significant tax contributions through both increased payroll taxes from the jobs created and Federal taxes on higher economic activity (Figure 3). The analysis projects that the Federal tax revenue contribution could be between \$2.6 and \$4.7 billion by 2018.

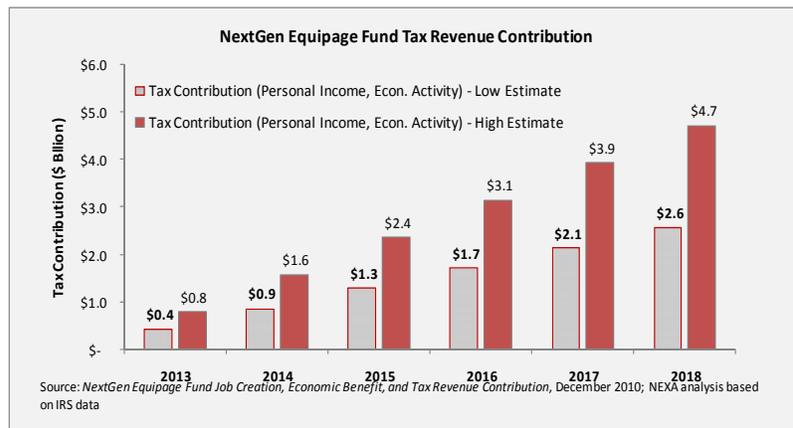


Figure 3

Without NextGen, FAA predicts that there will be gridlock in the skies. NEXA Advisors concludes that without the early investments made by the NextGen Fund beginning in 2013, aircraft equipage could be delayed by several years or more likely, for a decade, and many of the economic and job benefits identified herein will be lost permanently.

## Background

The FAA is accelerating investment in NextGen infrastructure development and has committed to fielding initial operating capability with key technologies including ADS-B and data communications (FANS 1/A and ATN) by 2018. FAA studies claim that significant benefits will be produced by combining FAA infrastructure modernization with aircraft so equipped with NextGen avionics and new flight procedures. According to FAA these benefits include, but are not limited to<sup>iii</sup>:

- Job creation
- Improved productivity of passengers through more efficient and predictable air transportation system
- Reduced FAA operating costs
- Enhanced safety and security capabilities
- Reduced environmental footprint

Without NextGen FAA predicts that there will be gridlock in the skies. By 2022, according to FAA, the cost to the U.S. economy will be \$22 billion annually in lost economic activity. That annual number grows to more than \$40 billion by 2033 if NextGen is not implemented<sup>iv</sup>.

The three basic cornerstone NextGen technologies include<sup>v</sup>:

- Automatic Dependent Surveillance - Broadcast (ADS-B)  
ADS-B will enable both pilots and controllers to see the same real-time displays of air traffic, substantially improving safety while increasing system capacity. ADS-B Out transmits from the aircraft. ADS-B In provides information into the aircraft to enhance situational displays.
- NextGen Data Communications (Data Comm)  
Data Comm technologies will allow for the exchanges of routine controller pilot messages and clearances via digital data transmission. This will enable controllers to safely handle more traffic, improving air traffic controller productivity, while enhancing the capacity and safety of the nation's airspace.
- System Wide Information Management (SWIM)  
SWIM will reduce redundancy and better facilitate information sharing. It will also enable new and faster modes of decision-making.

A "NextGen Equipage Paradox" exists because as matters stand today, those operators who are last to equip with NextGen avionics gain the greatest financial benefit, while those operators first to adopt the new technologies will pay a much higher price at a far greater risk. The NextGen Fund solves the "NextGen Equipage Paradox" through a combination of innovative regulatory, policy, and contractual mechanisms; supported with private sector capital, commercial financing practices, early payment deferrals, and modest Federal loan guarantees. The Fund is a \$1.5 billion private sector funded capital pool, capable of equipping more than 70 percent of the U.S. commercial air transport fleet (Figure 4).

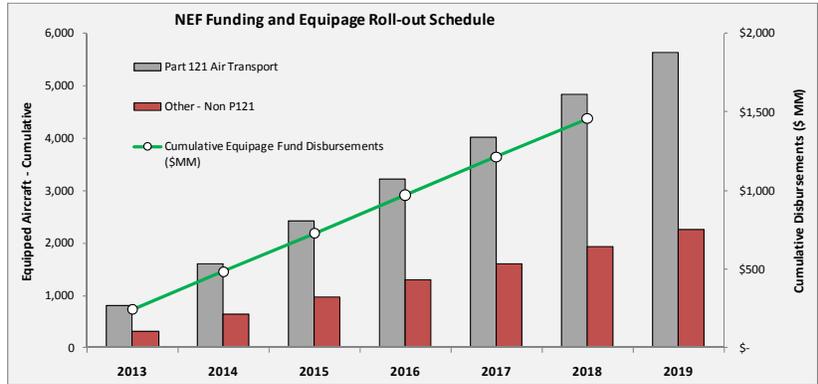


Figure 4

## Job Creation

The NextGen Fund will create new sustainable jobs as soon as 2013. These jobs include engineers, software developers, and other high-tech workers to support the development, installation and life cycle support of the NextGen avionics. Without the NextGen Fund, the industry is likely to delay equipage until much closer to the ADS-B mandated equipage date of 2020. NEXA Advisors believes that without the Fund the industry will not begin retrofitting older aircraft until 2017, or later.

The FAA Office of Aviation Policy, Plans, and the Environment estimated that an infusion of \$4 billion in funding for NextGen would generate 77,000 jobs based on the Bureau of Labor Statistics data. NEXA Advisors first used FAA’s methodology contained in the FAA’s annual study on the Economic Impact of Civil Aviation on the U.S. Economy to estimate the number of jobs NextGen will create. Based on this analysis, aircraft equipage is estimated to create 24 jobs, defined as Full-Time Equivalents (FTE), for every \$1 million dollars invested in the year the funds are spent.<sup>vi</sup> The estimate of equipage includes ADS-B and Ground-Based Augmentation System (GBAS). NEXA Advisors also researched job creation across other industries (Figure 5) and found an average of 17 jobs are created per million dollars invested.

Industry / Project	New Jobs /\$1M investments
Start-ups / VC	25
Tech/Innovation	17
Federal Transport	15
Green / restoration	22
Clean Energy	17
New ventures	25
Service Areas (FL)	10
Rerstoration (OR)	15
Immigration (Green Card req)	10
Average New Jobs/\$1M Invested	17

Figure 5

NEXA Advisors finds it reasonable to assume that new technologies avionics equipment, including SWIM and Data Comm, will have the same ratio of jobs to \$1 million dollars invested. NEXA Advisors also assumes that the manufacture of the avionics for surveillance and communications will take place in the U.S. while 20 percent of the installation will take place outside of the U.S. since airlines outsource heavy maintenance to other countries.<sup>vii</sup> NEXA Advisors further assumes that for NextGen equipment, the job creation is divided between avionics manufacturing and installation/maintenance on the aircraft. Therefore, it is assumed that 90 percent of the jobs created will be in the U.S.

Using this formula, the NextGen Fund is projected to create between 23,000 and 32,000 sustainable U.S. jobs from 2013 to 2018.

## Economic Benefits

The total economic benefit contribution of the NextGen Fund is the summation of primary impacts (direct and indirect), induced impacts, and catalytic impacts, which are defined as the impacts of aviation beyond any effects that are directly or indirectly associated with the air transport industry itself. Economic contributions beyond the direct impacts are produced by using multipliers to measure the ripple contribution throughout the economy. Indirect, induced, and catalytic effects are found by applying multipliers to the direct contributions.

Because the FAA multiplier for indirect benefits<sup>viii</sup> is heavily weighted towards air passenger revenues, NEXA Advisors used the DRI-WEFA multiplier<sup>ix</sup> for indirect and induced impacts produced by manufacturers in the 2002 aviation economic benefit report. DRI-WEFA found that for most industries the indirect impact is generally about the same as the direct impact. However, the aviation industry has high labor costs, and as a result, the direct impact is higher than for most other industries. The induced benefits are derived from purchases from the income provided to employees in the direct and indirect provision of goods and service and from the spending of income generated from industries for which air transportation provides an enabling function (e.g., travel and tourism and, broadly, economic development). The DRI-WEFA multipliers used in this study are presented in the table below (Figure 6).

DRI-WEFA 2002 Multipliers		
Aircraft And Aircraft Parts (Manufacturing)		
	GDP - Billions	Multiplier
Direct	\$ 24.5	1.00
Indirect	\$ 51.9	2.12
Induced	\$ 39.0	1.59

Figure 6

### Direct Economic Benefits

The direct impacts of the NextGen Fund are created through manufacturing of NextGen avionics to equip aircraft and the labor, in terms of payroll and benefits associated with installation and maintenance of the avionics equipment on aircraft. For the purposes of this study, the direct impacts

are considered to be the disbursements from the Fund. The outputs from these activities are associated with the following sectors of the aviation industry and shown in Figure 7:

- Direct Fund Expenditures
  - Labor: Salary, wages, and related
  - Materials: Components and commodities
  - Services: Installation, training, maintenance, repair, and overhaul (MRO)
  
- Examples
  - Avionics and component manufacturing and the supporting software
  - Services: Installation, Maintenance, Repair, and Overhaul (MRO), and Training

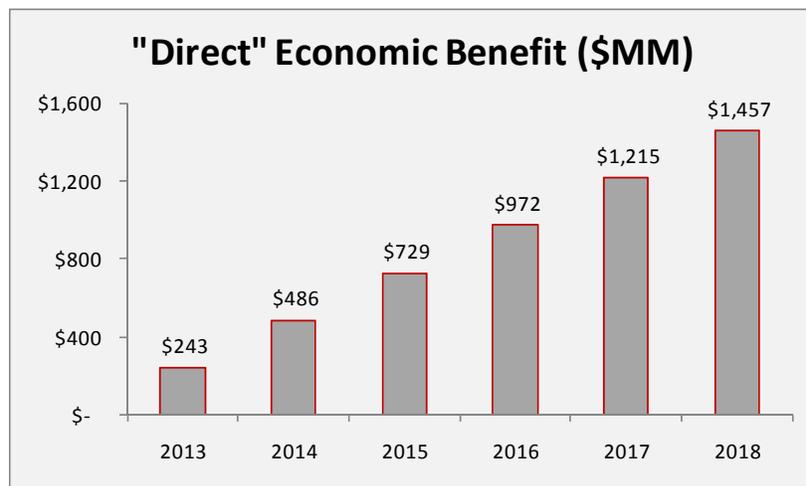


Figure 7

### *Indirect Economic Benefits*

The indirect impacts of the NextGen Fund are created from expenditures by users of the air transportation system, i.e., supply chain support for the manufacture of NextGen avionics and components. Outputs from these activities include:

- Indirect Fund Expenditures
  - Supply chain support for avionics and supporting software
  - Goods and services purchased by commercial aviation in the economy
  
- Examples
  - Research and development
  - Parts to support manufacture, installation, and maintenance of NextGen avionics
  - FAA and Air Traffic Management programs

Research and development of new technologies for NextGen avionics will be a significant indirect stimulus and benefit of the Fund. One of the Future of Aviation Advisory Committee's<sup>x</sup> top recommendations is the acceleration of aircraft technology development with more robust research and development by government and industry. The Fund will create a stable environment for investment in the development of new technologies.

The DRI-WEFA multiplier for manufacturers applied to the NextGen Fund disbursements produces indirect benefits of the Fund at the end of the investment period of \$3 billion, as shown in Figure 8.

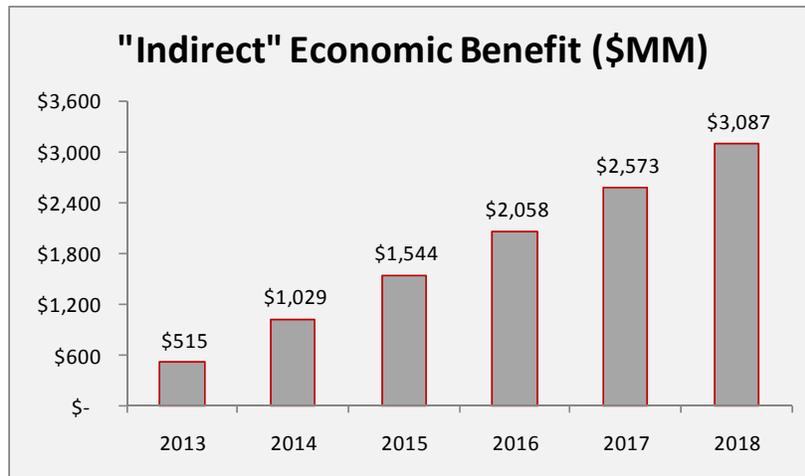


Figure 8

### *Induced Economic Benefits*

The induced impact of the NextGen Fund captures secondary impacts to the economy as direct and indirect sales and payroll. It is the measure of the spending by those employed in air transport services on other goods and services and the spending in other industries that is enabled by air transport.

Applying the DRI-WEFA manufacturing factors to the NextGen Fund disbursements produces induced benefits of the Fund at the end of the investment period of \$2.3 billion, as shown in Figure 9.

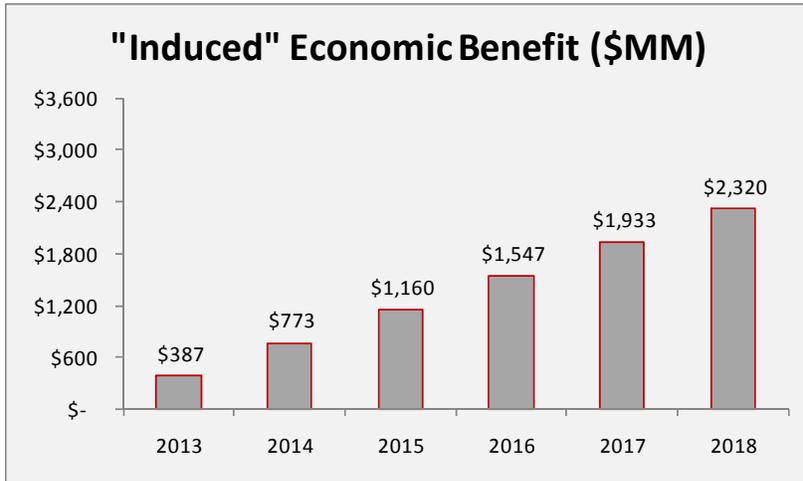


Figure 9

### Catalytic Economic Benefits

The catalytic impact of the NextGen Fund captures the spillover effects. Catalytic impact is in addition to the direct, indirect and induced benefits, capturing the extent to which NextGen equipage stimulates growth in air transport and thereby accelerates the growth of other industries. Unique to the NextGen Fund is the acceleration of NextGen technology thereby allowing for FAA to implement programs that will reduce delays and the associated costs. As shown in Figure 10, more than \$16.6 billion in economic activity is brought forward in time by the NextGen Fund.

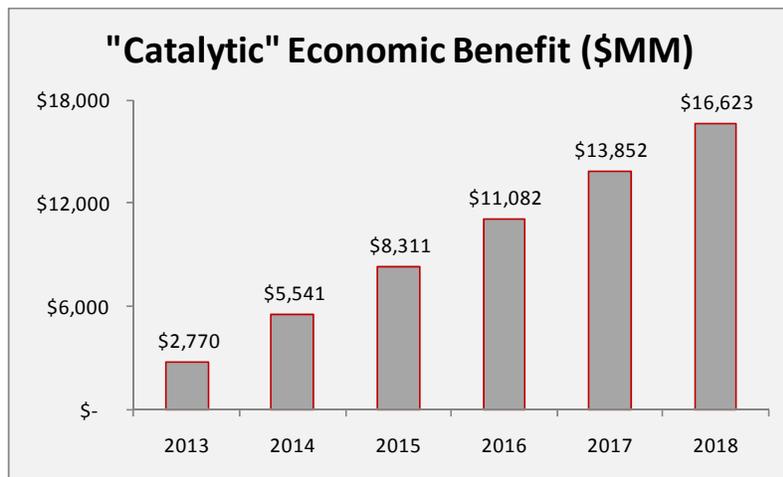


Figure 10

Eurocontrol found three categories of catalytic impacts: consumer surplus, economic spillover, plus environmental and social impacts.<sup>xi</sup> The Eurocontrol study quoted here provided a robust methodology for measuring economic impacts of air transport as demonstrated in the flow diagram of Figure 11.

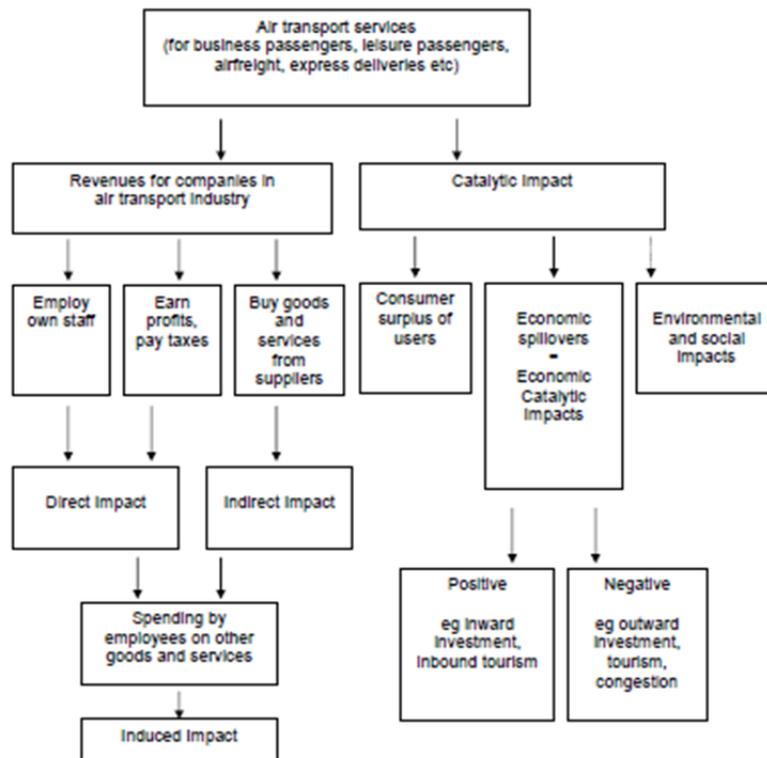


Figure 11

The NextGen Fund's goal is to accelerate aircraft equipage by several years, thus fully exploiting benefits much sooner than otherwise possible. Catalytic impacts are also accelerated, and produce, thus capture, the following near term results:

- Consumer benefits:
  - Delay reduction
  - Predictability
  - Increased productivity
- Economic spillovers:
  - Increased connectivity
  - Tourism and trade
  - Investment
  - International competitiveness
- Environmental:
  - Emissions reduction
  - Noise management
  - Improved public health

### *Catalytic Benefits: Consumer*

Consumers will benefit because NextGen equipage will enable the air transport sector to operate a more reliable and predictable passenger services model and system that will lead to improved productivity for passengers. The National Center of Excellence for Aviation Operations Research found the cost to passengers of flight delays and cancellations, in quantifiable terms of lost productivity, to be \$16 billion annually<sup>xii</sup>.

Equipage of aircraft with NextGen technology will increase the ability of airlines to create connections by improving the efficiency of the overall system. Connectivity enhances the productivity by providing better access to more markets, enhancing business communications and interactions, and by providing ease of access to a much larger labor pool. Sustained improvements in connectivity increase exports and facilitate tourism. IATA found that a 10 percent increase in connectivity results in a 0.07 percent increase in productivity.<sup>xiii</sup> Better connectivity also improves air cargo services and facilitates just-in-time shipping. Just-in-time shipping reduces supply chain production and development cycle times and reduces inventory requirements.<sup>xiv</sup>

### *Catalytic Benefits: Environmental*

In 2008 GAO advocated accelerated deployment of NextGen to realize environmental benefits.<sup>xv</sup> More efficient operations will lower unit emissions per passenger through lower fuel burn per passenger. Aviation emissions, like other combustible emissions, include pollutants that affect public health. The FAA estimates that NextGen could reduce aircraft greenhouse emissions by as much as 12 percent, which is equivalent to removing 2.2 million cars from the roads.<sup>xvi</sup> Additionally, improved air transportation will reduce the number of passengers diverted to their cars on the U.S. roadways and thereby reduce air pollution from cars and reduce congestion on the highways.

NextGen procedures will reduce communities' exposure to noise through better air traffic management. For example, Continuous Descent Arrivals will allow aircraft to remain at cruise longer as they approach destination airports, use lower power levels, and thereby lower noise and emissions during landing. These environmental benefits will also improve international flight efficiencies, further reducing emissions and greenhouse gasses.

### *Catalytic Benefits: Tourism and Trade*

A primary benefit of air transportation is the facilitation of tourism and trade. A more efficient air transportation system will lead to an increase in visitors and trade with other countries.

### *Catalytic Benefits: Investment*

Access to the air transportation system is often cited as critical to investment decisions<sup>xvii</sup>. The improved efficiency of the system will lead to better quality of air transportation and thus is likely to influence investment in the United States. If better quality air transportation encourages greater net investment, it will raise a region's capital stock and the potential level of GDP it can generate. Inward investment has the added benefit of introducing new technologies or management techniques that can further increase GDP by raising underlying productivity. Air transportation also enables a region to attract high quality employees, which also raises underlying productivity.

### **Catalytic Benefits: International Competitiveness**

Improved air transportation results in more efficient business operations, reduced costs, and increased U.S. international competitiveness.<sup>xviii</sup> NextGen will improve U.S. competitiveness by lowering the travel time and therefore the costs for both passengers and cargo. Just-in-time inventory management facilitated by efficient air cargo operations plays an important role in the U.S. maintaining global competitiveness.

The aerospace industry provides a significant positive contribution to the U.S. balance of trade.<sup>xix</sup> The U.S. competitive position can be reinforced by taking leadership in aircraft equipage for NextGen technologies. This leadership applies to both the U.S. air transport sector, and the aerospace manufacturing sector, OEM and component alike.

### **Catalytic Benefits: Multiplier Impact**

On behalf of the Air Transport Action Group, Oxford Economic Forecasting<sup>xx</sup> found that catalytic multiplier for aerospace in North America to be 2.42 (Figure 12). NEXA Advisors applied this factor to the combined direct, indirect, and induced economic benefits and found the resulting catalytic benefits of the Fund in 2018 are estimated to be \$16.6 billion.

ATAG (Oxford Economic Forecasting) 2008		
Aerospace - North America	GDP - billions	Multiplier
Direct	19	1.00
Indirect+ Induced	62	3.26
NA Aerospace Contribution	81	
NA All Air Transport	410	
Catalytic - NA All Air transport	992.8	2.42

Figure 12

An interesting anecdote is that the International Civil Aviation Organization (ICAO) found in a recent study<sup>xxi</sup> that globally, every 100 jobs generated by air transport creates or supports an additional 610 jobs in other industries. Thus by extension, the Fund could be expected to create or support 2 million jobs in other industries through catalytic effects.

### **Federal Revenue Contribution**

The NextGen Fund will generate significant tax revenue contributions to the Federal government through both payroll taxes from a larger workforce, and general taxes on economic activity. NEXA Advisors calculated the average salary for aviation jobs from the FAA 2009 *Economic Impact of Civil Aviation to the U.S. Economy* to be about \$50,000<sup>xxii</sup>. Using the tax bracket tables from the Internal Revenue Service, the tax rate is 25 percent for single income of between \$34,000 and \$82,000, and head of household income between \$45,550 and \$117,650.<sup>xxiii</sup> By applying an average 18 percent tax bracket to the average aviation job, NEXA Advisors found that the Fund will contribute between \$34 and \$80

million in personal income taxes in 2013, increasing to between \$204 and \$480 million personal income tax contribution in 2018.

Government revenue from taxes, fees, and business revenue, has increased to more than 35 percent of GDP. Federal revenue has remained relatively steady, holding at between 15 and 20 percent of GDP.<sup>xxiv</sup> NEXA Advisors applied a low of 10 percent and a high 18 percent Federal tax contribution rate to the total economic contributions arising from the investments made by the Fund. This results in a projected Federal tax contribution of \$705 million in 2013, increasing to between \$2.5 and \$4.2 billion by 2018. Total tax contributions from the activity generated by the Fund are projected to reach between \$2.5 and \$4.7 billion by 2018 as shown in Figure 13.

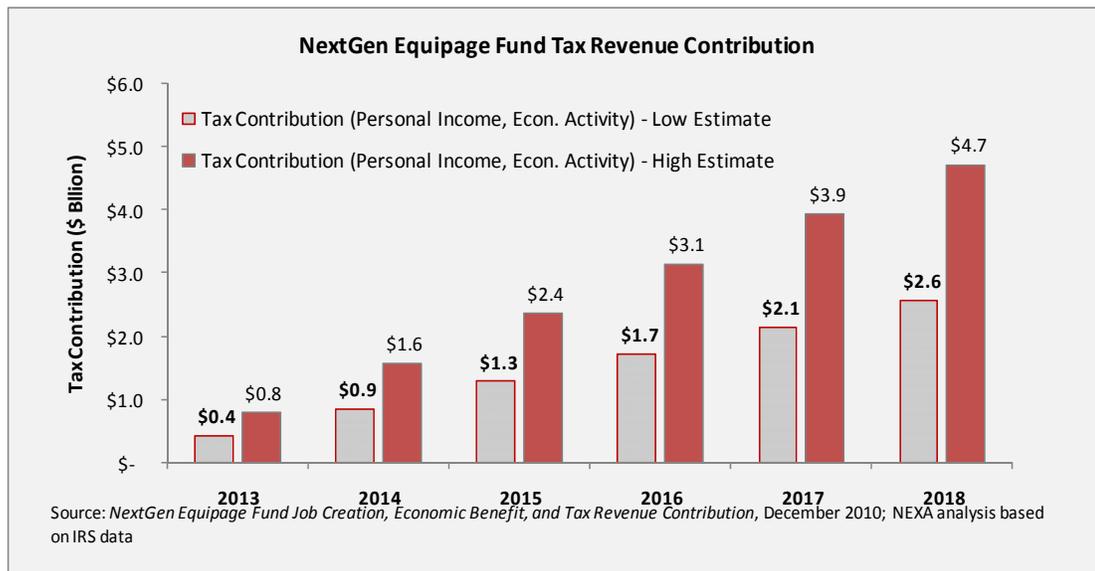


Figure 13

## Conclusions

NEXA Advisors has provided a realistic projection of the Fund’s contributions to the U.S. economy by carefully applying proven methodologies borrowed from prior economic studies. Without the NextGen Fund, there is little likelihood of airlines equipping in advance of mandated compliance dates beginning in 2020. The NextGen Fund is essential to accelerating the implementation of NextGen technologies, and the economic arguments strongly support this conclusion. As the GAO pointed out, the sooner the industry equips for NextGen, the sooner the U.S. will begin to realize the benefits. Without the NextGen Fund, some NextGen benefits could never be fully captured.

## About NEXA Advisors

NEXA Advisors provides economic, financial, M&A and strategic advisory services to the aerospace, defense and geomatics sectors. We work with outstanding companies and management teams currently positioned to benefit from emerging factors driving sector transformation and growth. We provide rigorous strategic advisory services formed from years of experience working in the industry. We can point to exciting examples of transformational business models we have touched in commercial aviation, the aerospace supply chain, business aviation, air traffic management, homeland security, energy and clean technologies, and geomatics. NEXA Advisors is a division of NEXA Capital Partners, LLC.

NEXA Advisors, LLC  
1250 24<sup>th</sup> Street NW, Suite 300  
Washington DC 20037  
Tel: 202-558-7417

[www.nexacapital.com](http://www.nexacapital.com)

# Data Appendix

NextGen Equiptage Fund Job Creation, Economic Benefit, and Tax Contribution												
Year	Direct /1	Jobs /2	Indirect /3	Induced /3	Total Direct, Indirect, Induced	Catalytic /4	Tax Contribution /5		Jobs/Low/2A			
							Personal Income Taxes	Economic Activity Taxes	Personal Income Tax /5A	Economic Activity Taxes	Total Tax Contribution	
2013	\$ 242,983,599	5,247	\$ 514,559,053	\$ 386,662,972.48	\$ 1,144,125,525	\$ 2,770,458,101	\$ 79,963,345	\$ 704,625,053	\$ 3,716	\$ 33,984,422	\$ 391,458,363	\$ 425,442,784
2014	\$ 465,807,199	10,493	\$ 1,029,118,107	\$ 773,325,744.96	\$ 2,288,251,050	\$ 5,540,916,202	\$ 159,926,691	\$ 1,402,250,105	\$ 7,433	\$ 67,968,844	\$ 782,916,725	\$ 850,885,569
2015	\$ 728,710,798	15,740	\$ 1,548,677,160	\$ 1,159,988,617.45	\$ 3,492,376,576	\$ 8,311,374,303	\$ 239,990,066	\$ 2,113,875,158	\$ 11,149	\$ 101,993,265	\$ 1,174,375,088	\$ 1,276,268,353
2016	\$ 971,614,398	20,897	\$ 2,038,236,214	\$ 1,546,651,488.93	\$ 4,576,502,101	\$ 11,081,832,404	\$ 319,953,381	\$ 2,888,500,211	\$ 14,866	\$ 135,957,687	\$ 1,565,833,451	\$ 1,701,771,138
2017	\$ 1,214,517,897	26,234	\$ 2,572,795,267	\$ 1,983,314,562.41	\$ 5,720,627,626	\$ 13,852,280,596	\$ 399,916,727	\$ 3,521,125,264	\$ 18,582	\$ 169,922,109	\$ 1,857,281,813	\$ 2,127,213,922
2018	\$ 1,457,421,596	31,480	\$ 3,087,354,320	\$ 2,319,977,234.89	\$ 6,864,753,151	\$ 16,622,748,607	\$ 479,780,072	\$ 4,227,750,316	\$ 22,299	\$ 203,946,531	\$ 2,348,750,176	\$ 2,552,656,716
1/ Assumes direct benefits = disbursements from the fund for purchase of avionics, software, installation, and maintenance												
2/ Source: Equipping Aircraft Will Create Jobs and Achieve Environmental and Safety Benefits Now* based on FAA multiplier for investment in NextGen.												
2A Jobs for every \$1 million invested in NextGen aircraft equiptage adjusted by 20% for MRO outside US.										2A Assumes average jobs created per \$1 million = 17		
NECA assumes that 100 percent of the avionics manufacturing jobs are created in the U.S. and that 20 percent of installation of the avionics during heavy maintenance occurs in other countries.										Adjusted downward by 10% for jobs outside the US		
On a rolling 4Q basis Form 41, 36 percent of total maintenance spending is outsourced. This includes all outsourcing, not just heavy maintenance and includes outsourcing services to companies both in the U.S. and outside.										Industry / Project	New Jobs / \$MM Investment	
AeroStrategy's market forecast for 2010 estimates that the U.S. airlines outsource 20 percent of heavy maintenance outside the U.S.										Start-ups / VC	25	
NECA assumes that the job creation is evenly split between avionics manufacturing and installation/maintenance on the aircraft. Therefore, it is assumed that 50 percent of the jobs created will be in the U.S.										Tech/Innovation	17	
										Federal Transport	15	
										Green / restoration	22	
										Clean Energy	17	
										New ventures	25	
										Service Areas (FL)	10	
										Restoration (OR)	15	
										Immigration (Green)	10	
										Average	17	
3/ DRI-MEFA 2002 Multipliers												
Aircraft And Aircraft Parts (Manufacturing)												
GDP- Billions												
Multiplier												
Direct \$ 24.5												
Multiplier 1.00												
Indirect \$ 51.9												
Multiplier 2.12												
Indirect \$ 39.0												
Multiplier 1.59												
ATA6 (Oxford Economic Forecasting) 2008												
Aerospace - North America												
GDP - billions												
Multiplier												
Direct 19												
Multiplier 1.00												
Indirect+ Induced 62												
Multiplier 3.26												
NA Aerospace Contributor 81												
NA All Air Transport 410												
Catalytic- NA All Air Transp 992.8												
Multiplier 2.42												
4/ ATA6 (Oxford Economic Forecasting) 2008												
Aerospace - North America												
GDP - billions												
Multiplier												
Direct 19												
Multiplier 1.00												
Indirect+ Induced 62												
Multiplier 3.26												
NA Aerospace Contributor 81												
NA All Air Transport 410												
Catalytic- NA All Air Transp 992.8												
Multiplier 2.42												
5/ Assumes personal income tax = 18%												
Tax revenue on economic activity = 10%												

## Reference List and Relevant Studies

- Aerospace Industries Association (2010) NextGen: The Future of Flying. Washington, D.C. Retrieved from Air Transport Action Group. (2006). *The economic & social benefits of air transport*. Prepared with Oxford Economic Forecasting. Retrieved from [http://www.icao.int/ATWorkshop/ATAG\\_SocialBenefitsAirTransport.pdf](http://www.icao.int/ATWorkshop/ATAG_SocialBenefitsAirTransport.pdf)
- Air Transport Association of America, Inc. (2010). *When America flies, it works. 2010 Economic Report*. Washington, D.C.
- Air Transport Association of America, Inc. (ATA), Coalition of Aviation Interests.(2009).*Equipping aircraft will create jobs and achieve environmental and safety benefits now*. Retrieved from [http://www.airlines.org/PublicPolicy/Coalition/Pages/letters\\_1-29-09.aspx](http://www.airlines.org/PublicPolicy/Coalition/Pages/letters_1-29-09.aspx) (<http://www.airlines.org/PublicPolicy/Coalition/Documents/coalition12909.pdf>) [http://www.airlines.org/PublicPolicy/Coalition/Pages/letters\\_11-23-09.aspx](http://www.airlines.org/PublicPolicy/Coalition/Pages/letters_11-23-09.aspx) (<http://www.airlines.org/PublicPolicy/Coalition/Documents/coalition112309.pdf>)
- British Airports Authority, Future of Air Transport Issues Paper (2004). *The economic benefits of aviation*. Retrieved from <http://www.baa.com/assets/B2CPortal/Static%20Files/economic04.pdf>
- DRI-WEFA, Inc., A Global Insight Company, In collaboration with Campbell-Hill, (2002). *The national impact of civil aviation*.
- European Organization for the Safety of Air Navigation, Eurocontrol Experimental Center. (2005). *The economic catalytic effects of air transport in Europe* (SEE Report EEC/SEE/2005/003) Retrieved from [http://www.eurocontrol.int/eec/gallery/content/public/document/eec/report/2005/025\\_Economic\\_Catalytic\\_Effects\\_of\\_Air\\_Transport\\_Europe%20.pdf](http://www.eurocontrol.int/eec/gallery/content/public/document/eec/report/2005/025_Economic_Catalytic_Effects_of_Air_Transport_Europe%20.pdf)
- Federal Aviation Administration, Air Traffic Office, (2009). *The economic impact of civil aviation on the U.S. economy*. Retrieved from [http://www.faa.gov/air\\_traffic/publications/media/FAA\\_Economic\\_Impact\\_Rpt\\_2009.pdf](http://www.faa.gov/air_traffic/publications/media/FAA_Economic_Impact_Rpt_2009.pdf)
- Federal Aviation Administration, Air Traffic Office, (2008). *The economic impact of civil aviation on the U.S. economy*. Retrieved from [http://www.faa.gov/about/office\\_org/headquarters\\_offices/ato/media/2008\\_Economic\\_Impact\\_Report\\_web.pdf](http://www.faa.gov/about/office_org/headquarters_offices/ato/media/2008_Economic_Impact_Report_web.pdf)
- Federal Aviation Administration, NextGen System Analysis, (2010). *FAA perspective on NextGen Benefits*. Presented at Transportation Research Board 89<sup>th</sup> Meeting.
- Federal Aviation Administration, Office of Aviation Policy and Plans.(2007). *Economic values for FAA investment and regulatory decisions, a guide*. Prepared by GRA (Contract No. DTFA 01-02-C00200). Retrieved from [http://www.faa.gov/regulations\\_policies/policy\\_guidance/benefit\\_cost/media/ECONOMICVALUESFORFAAINVESTMENTANDREGULATORYDECISIONS10032007.pdf](http://www.faa.gov/regulations_policies/policy_guidance/benefit_cost/media/ECONOMICVALUESFORFAAINVESTMENTANDREGULATORYDECISIONS10032007.pdf)
- Federal Aviation Administration, Office of Aviation Policy and Plans. (1998). *Economic analysis of investment and regulatory decisions*. (FAA-APO-98-4). Retrieved from [http://www.faa.gov/regulations\\_policies/policy\\_guidance/benefit\\_cost/media/economic.pdf](http://www.faa.gov/regulations_policies/policy_guidance/benefit_cost/media/economic.pdf)
- Future of Aviation Advisory Committee. (2010). *December 15, 2010 Recommendations*. Retrieved from <http://www.dot.gov/faac/docs/recommendations.pdf>
- General Aviation Manufacturers Association. (2006). *General aviation's contribution to the U.S. economy*. Prepared by MergeGlobal, Washington, D.C. Retrieved from [http://www.ok.gov/OAC/documents/General%20Aviation%20Contribution%20to%20the%20US%20Economy%20\(GAMA\).pdf](http://www.ok.gov/OAC/documents/General%20Aviation%20Contribution%20to%20the%20US%20Economy%20(GAMA).pdf)
- International Civil Aviation Organization. (2004). *Economic contribution of civil aviation*. (Circular 292-AT/124) ICAO, Montreal, Canada Retrieved from [http://www.icao.int/atworkshop/C292\\_Vol1.pdf](http://www.icao.int/atworkshop/C292_Vol1.pdf)

International Civil Aviation Organization. (2002). *Economic contribution of civil aviation: Ripple of prosperity*. ICAO, Montreal, Canada

International Air Transport Association. (2006). *Measuring the economic rate of return on investment in aviation*. Prepared by InterVISTAS Consulting, Vancouver, Canada

Loughborough University, Omega Management Team. (2009). *Economic benefits of aviation – technical report* (Omega Study 40). Higher Education Funding Council for England.

The National Center of Excellence for Aviation Operations Research. (2010) *Total delay impact study: A comprehensive assessment of the costs and impacts of flight delay in the United States*. Port of New York and New Jersey, Aviation Department, Office of Policy and Planning (2005). *The economic impact of the aviation industry on the New York– New Jersey metropolitan region*.

United States Government Accountability Office. (2008). *Aviation and the environment: NextGen and research and development are keys to reducing emissions and their impact on health and climate*. (GAO-08-706T)

## Endnotes

- 
- <sup>i</sup> Federal Aviation Administration, Air Traffic Office, (2009). *The economic impact of civil aviation on the U.S. economy*. p. 7.
- <sup>ii</sup> Ibid
- <sup>ii</sup> NextGen Fact Sheet
- <sup>iii</sup> Federal Aviation Administration, NextGen System Analysis, (2010). *FAA perspective on NextGen Benefits*.
- <sup>iv</sup> Ibid.
- <sup>v</sup> Aerospace Industries Association (2010) NextGen: The Future of Flying. Washington, D.C
- <sup>vi</sup> Calculated from Federal Aviation Administration, Air Traffic Office, (2009). The economic impact of civil aviation on the U.S. economy Table 4. Total output/Jobs = 24
- <sup>vii</sup> NEXA Advisors assumes that 100 percent of the avionics manufacturing jobs are created in the U.S. and that 20 percent of installation of the avionics during heavy maintenance occurs in other countries. On a rolling 4Q basis Form 41 show 36 percent of total maintenance spending is outsourced. This includes all outsourcing, not just heavy maintenance and includes outsourcing services to companies both in the U.S. and outside. AeroStrategy's market forecast for 2010 estimates that the U.S. airlines outsource 20 percent of heavy maintenance outside the U.S. NEXA Advisors assumes that the job creation is evenly split between avionics manufacturing and installation/maintenance on the aircraft. Therefore, it is assumed that 90 percent of the jobs created will be in the U.S.
- <sup>viii</sup> Federal Aviation Administration, Air Traffic Office, (2009). *The economic impact of civil aviation on the U.S. economy*. p. 19.
- <sup>ix</sup> DRI-WEFA, Inc., A Global Insight Company, In collaboration with Campbell-Hill, (2002). *The national impact of civil aviation*.
- <sup>x</sup> Future of Aviation Advisory Committee, December 2010 presentation
- <sup>xi</sup> European Organization for the Safety of Air Navigation, Eurocontrol Experimental Center. (2005). *The economic catalytic effects of air transport in Europe* (SEE Report EEC/SEE/2005/003)
- <sup>xii</sup> The National Center of Excellence for Aviation Operations Research. (2010) *Total delay impact study: A comprehensive assessment of the costs and impacts of flight delay in the United States*.
- <sup>xiii</sup> International Air Transport Association. (2006). *Measuring the economic rate of return on investment in aviation*.
- <sup>xiv</sup> DRI-WEFA, Inc., A Global Insight Company, In collaboration with Campbell-Hill, (2002). *The national impact of civil aviation*
- <sup>xv</sup> United States Government Accountability Office, *Aviation and the environment: NextGen and research and development are keys to reducing emissions and their impact on health and climate*
- <sup>xvi</sup> FAA NextGen website
- <sup>xvii</sup> Air Transport Action Group. (2006). *The economic & social benefits of air transport*. Prepared with Oxford Economic Forecasting.
- <sup>xviii</sup> DRI-WEFA, Inc., A Global Insight Company, In collaboration with Campbell-Hill, (2002). *The national impact of civil aviation*
- <sup>xix</sup> Federal Aviation Administration, Air Traffic Office, (2009). *The economic impact of civil aviation on the U.S. economy*. Using FAA multipliers, the direct, indirect, and induced benefits of the fund in 2018 would be \$7.6 billion.
- <sup>xx</sup> Air Transport Action Group. (2006). *The economic & social benefits of air transport*. Prepared with Oxford Economic Forecasting.
- <sup>xxi</sup> International Civil Aviation Organization. (2002). *Economic contribution of civil aviation: Ripple of prosperity*. ICAO, Montreal, Canada
- <sup>xxii</sup> Federal Aviation Administration, Air Traffic Office, (2009). *The economic impact of civil aviation on the U.S. economy*. Using FAA multipliers, the direct, indirect, and induced benefits of the fund in 2018 would be \$7.6 billion. Total earnings = \$57 billion / Jobs 1,122 (thousand) = \$50,802 average salary
- <sup>xxiii</sup> IRS website, 2010 tax brackets
- <sup>xxiv</sup> [www.usgovernmentrevenue.com](http://www.usgovernmentrevenue.com)