Federal Aviation Administration

FY 2012

Portfolio of Goals

PORTFOLIO OF GOALS

FAA Performance Metrics – FY 2012

TABLE OF CONTENTS

DESTINATION 2025

Next Level of Safety

Delivering Aviation Access through Innovation

Sustaining our Future

Improved Global Performance through Collaboration

Workplace of Choice

DRAFT DOT STRATEGIC PLAN

FY 2012 – FY 2017

Safety

State of Good Repair

Economic Competitiveness

Environmental Sustainability

PORTFOLIO OF GOALS
FY 2012 Methodology Report
FAA *Destination 2025* Performance Metrics

Federal Aviation Administration

NEXT LEVEL OF SAFETY
Commercial Air Carrier Fatality Rate

FY 2012 Performance Target

In FY 2012, the commercial air carrier fatality rate will not exceed 7.6 fatalities per 100 million people on board.

Destination 2025 Outcome and Performance Metric

Outcome: No accident-related fatalities occur on commercial service aircraft in the U.S.

Performance Metric: Reduce the commercial air carrier fatalities per 100 million persons on board by 24 percent over 9-year period (2010-2018). No more than 6.2 in 2018.

Lead Organization: Aviation Safety

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
Target	8.7	8.4	8.1	7.9	7.6
Actual	0.4	6.7	0.3	0.0[1]	TBD

1 Preliminary estimate. Final data will be available in March 2013.

Definition of Metric

Metric Unit: Number of fatalities per 100 million persons on board.

Computation: Number of fatalities, including ramp accidents and other fatalities as a result of the accident, divided by number of passengers and crew on board flights.

Formula:

$$\frac{\text{Number of commercial air carrier fatalities}}{(\text{Number of persons on board}/100{,}000{,}000)}$$

Scope of Metric: This metric includes both scheduled and nonscheduled flights of U.S. passenger and cargo air carriers (14 CFR Part 121) and scheduled passenger flights of commuter operators (14 CFR Part 135). It excludes on-demand (i.e., air taxi) service and general aviation. Accidents involving passengers, crew, ground personnel, and the uninvolved public are all included.

Method of Setting Target: The annual targets were calculated to reflect a linear reduction based on the long-term strategic target to reduce fatalities per 100 million persons on board to 4.4% by the year 2025. The baseline, 8.88% was established during the 1997-2006 timeframe.

Why the FAA Chooses this Metric

We chose this metric because it is easy to understand and measures the individual risk to the flying public. The metric will help us to move toward a low sustainable rate by maintaining our focus on recently identified risks.

Public Benefit

As fatal air carrier accidents have declined in terms of average fatalities per accident, this metric will sharpen FAA's focus on helping air travel become even safer.

Partners

Bureau of Transportation Statistics (BTS); National Transportation Safety Board (NTSB); FAA's Office of

Policy, International Affairs and Environment (APL).

External Factors Affecting Performance

Approximately 80 percent of fatal accidents are directly related to some form or combination of human factors. These run the gamut of external organizational influences, inadequate supervision, personnel factors (such as self-imposed stress), to individual acts, such as skill-based errors, misperception errors, judgment and decision-making errors, etc. While an accident's causation can be thoroughly investigated and understood by FAA, as a practical matter, the agency's ability to influence basic decisions by every pilot, every day, and in every circumstance to prevent the accidents becomes much more difficult.

Source of the Data

The data on commercial fatalities come from NTSB's Aviation Accident Database. All but a small share of the data for persons on board comes from the air carriers, who submit information for all passengers on board to the Office of Airline Information (OAI) within BTS. In addition, FAA estimates crew on board based on the distribution of aircraft departures by make and model, plus an average of 3.5 persons on board per Part 121 cargo flight.

Statistical Issues

Both accidents and passengers on board are censuses, having no sampling error. Crew on board is an estimate with a small range of variation for any given make and model of aircraft. Departure data and enplanements for Part 121 are from the BTS. The crew estimate is based on fleet makeup and crew requirements per number of seats. For the current fleet, the number of crew is equal to about seven percent of all Part 121 enplanements. The average number of cargo crew on board is 3.5 per departure, based on data from subscription services such as Air Claims, a proprietary database used by insurers to obtain information such as fleet mix, accidents and claims. Cargo crews typically include two flight crew members, and occasionally another pilot or company rep, or two deadheading passengers. Part 135 data also comes from BTS and Air Claims databases, but is not as complete. AEP calls the operators where BTS data have gaps. Based on previous accident and incident reports, the average Part 135 enplanement is five per departure. Crew estimates for Part 135 are based on previous accident and incident data. Any error that might be introduced by estimating crew will be very small and will be overwhelmed by the passenger census. Also, note that the fatality rate is small and could significantly fluctuate from year to year due to a single accident.

Completeness

The FAA does comparison checking of the departure data collected by BTS. This data is needed for crew estimates. However, FAA has no independent data sources against which to validate the numbers submitted to BTS. FAA compares its list of carriers to the Department of Transportation list to validate completeness and places the carriers in the appropriate category (i.e., Part 121 or Part 135). The number of actual persons on board for any given period is considered preliminary for up to 18 months after the close of the reporting period. This is due to amended reports subsequently filed by the air carriers. Preliminary estimates are based on projections of the growth in departures developed by APL. However, changes to the number of persons on board should rarely affect the annual fatality rate. NTSB and FAA's Office of Accident Investigation and Prevention meet regularly to validate the accident and fatality count.

To overcome reporting delays of 60 to 90 days, FAA must rely on historical data, partial internal data sources, and Official Airline Guide (OAG) scheduling information to project at least part of the fiscal year activity data. The FAA uses OAG data until official BTS data are available. The final result for the air carrier fatality rate is not considered reliable until BTS provides preliminary numbers. Due to reporting procedures in place, it is unlikely that calculation of future fiscal year departure data will be markedly improved. This lack of complete historical data on a monthly basis and independent sources of verification increases the risk of error in the activity data.

NTSB and the Office of Accident Investigation and Prevention meet regularly to validate information on the number of fatalities. Accident data are considered preliminary. NTSB usually completes investigations and issues reports on accidents that occur during any fiscal year by the end of the next fiscal year. Results are considered final when all those accidents have been reported in the NTSB press release published by March. FY 2012 results will therefore be final after the 2014 press release. In general, however, fatal and serious injury accident numbers are not likely to change significantly between the end of the fiscal year and the date they are finalized.

Reliability

Results are considered preliminary based on projected activity data. The FAA uses performance data extensively for program management, personnel evaluation, and accountability. Most accident investigations are a joint undertaking. NTSB has the statutory responsibility to determine probable cause, while FAA has separate statutory authority to investigate accidents and incidents in order to ensure that FAA meets its broader responsibilities. The FAA's own accident investigators and other FAA employees participate in all accident investigations led by NTSB investigators.

PORTFOLIO OF GOALS
FY 2012 Methodology Report
FAA *Destination 2025* Performance Metrics

Federal Aviation Administration

NEXT LEVEL OF SAFETY
General Aviation Fatal Accident Rate

FY 2012 Performance Target

Reduce the general aviation fatal accident rate to no more than 1.07 fatal accidents per 100,000 flight hours.

***Destination 2025* Outcome and Performance Metric**

Outcome: There is a reduction in the general aviation fatal accident rate.

Performance Metric: Reduce the general aviation fatal accident rate to no more than 1 fatal accident per 100,000 flight hours by 2018.

Lead Organization: Aviation Safety

	FY 2008	FY 2009[1]	FY 2010	FY 2011	FY 2012
Target	N/A	1.11	1.10	1.08	1.07
Actual	N/A	1.17	1.10	1.12[2]	TBD

[1] This was a new metric for FY09, replacing the numerical general aviation fatal accident reduction metric. No data are available for prior years.
[2] Preliminary estimate. Final data will be available in March 2013.

Definition of Metric

Metric Unit: Number of fatal accidents per 100,000 flight hours.

Computation: The number of general aviation fatal accidents divided by the number of flight hours.

Formula:

$$\frac{\text{Number of general aviation fatal accidents}}{(\text{Number of general aviation flight hours} / 100{,}000)}$$

Scope of Metric: This metric includes on-demand (non-scheduled FAR Part 135) and general aviation flights. General aviation comprises a diverse range of aviation activities, from single-seat homebuilt aircraft, helicopters, balloons, single and multiple engine land and seaplanes, to highly sophisticated, extended range turbojets.

Method of Setting Target: The three safest years in general aviation history (Jun 2006-May 2008) were used as the baseline. Government and industry consensus was to target a 10 percent reduction in 10 years from this baseline. Each year's annual target is a linear reduction to achieve the overall 10 percent reduction in 10 years. Therefore, we do not have targets beyond 2018.

Why the FAA Chooses this Metric

The success of FAA and industry collaborative safety initiatives continues to drive the general aviation fatal accident rate lower. This metric was adopted in FY 2009 to replace the existing general aviation fatal accident metric. The FAA and the general aviation community have determined that a general aviation fatal accident rate rather than the number of fatal accidents is a better performance metric because the rate reflects fleet activity levels and their relationship to the number of fatal accidents. The Fatal Accident Rate is a true rate-based metric and tracks changes in the fatal accident rate for a fixed volume of flight hours (per 100,000).

PORTFOLIO OF GOALS
FY 2012 Methodology Report
FAA *Destination 2025* Performance Metrics

Federal Aviation Administration

SAFETY
Serious Runway Incursions Rate

FY 2012 Performance Target

Reduce Category A & B (most serious) runway incursions to a rate of no more than .395 per million operations.

Destination 2025 Outcome and Performance Metric

Outcome: Aviation risk is reduced through all phases of flight (gate-to-gate).

Performance Metric: Reduce Category A & B (most serious) runway incursions to a rate of no more than .395 per million operations, and maintain or improve through FY 2013.

Lead Organization: Air Traffic

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
Target	0.509	0.472	0.450	0.450	0.395
Actual	0.427	0.227	0.117	0.138	TBD

Definition of Metric

Metric Unit: Rate of Category A & B (most serious) runway incursions per million operations.

Computation: The total number of Category A and B runway incursions is divided by the sum of the number operations divided by 1 million.

Formula:

$$\frac{\text{Number of A \& B Incursions}}{(\text{Operations Count}/1{,}000{,}000)}$$

Scope of Metric: A runway incursion is any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and takeoff of aircraft. They are grouped in three general categories: air traffic, pilot, or vehicle/pedestrian events Runway incursions are reported and tracked at airports that have an operational air traffic control tower. Operations are defined as total takeoffs and landings.

The FAA tracks four categories of runway incursions - A, B, C, D - but includes only those with the highest risk of collision, Category A and B incursions, in the measure.

- Category A: Separation decreases to the point that participants take extreme action to narrowly avoid a collision.
- Category B: Separation decreases, and there is a significant potential for a collision.
- Category C: Separation decreases, but there is ample time and distance to avoid a collision.
- Category D: There is little or no chance of collision, but the definition of a runway incursion is met.

In FY 2002 FAA changed the focus of measurement for runway incursions from all incursions to those incursions with measurable risk of collision, Categories A and B. Since Category C and D incursions were not likely to lead to an accident or a

significant risk of an accident, their inclusion in the previous total tended to mask true safety risk. The new measure reflects the focus of FAA's runway safety effort to reduce the rate of the incursions with demonstrable risk.

Method of Setting Target: This target was set based on past history and long term trends of the rate of serious runway incursion events.

Why the FAA Chooses this Metric

Runway incursions create dangerous situations that can lead to serious accidents. Reducing the number of runway incursions lessens the probability of accidents that potentially involve fatalities, injuries, and significant property damage.

Public Benefit

Reduced probability that the public will be injured or killed in an accident resulting from a runway incursion.

Partners

The FAA Co-Chairs the Runway Safety Council with National Air Traffic Controllers Association. Other Council members include the Airline Transport Association, the Air Line Pilots Association, Aircraft Owners and Pilots Association, National Association of Flight Instructors, National Business Aviation Association, Regional Airline Association, National Air Traffic Controllers Association, Airport Councils International-North America, and the American Association of Airport Executives.

External Factors Affecting Performance

Runway incursions are the result of an air traffic controller, pilot, or vehicle/pedestrian event. The FAA has direct influence on air traffic controller performance, but indirect influence on pilots and airport personnel.

Source of the Data

Air traffic controllers and pilots are the primary source of runway incursion reports. The data are recorded in the FAA Air Traffic Quality Assurance (ATQA) database. The ATQA replaced the FAA National Incident Monitoring System. Preliminary incident reports are evaluated when received and evaluation can take up to 90 days.

Operations data used to calculate the runway incursion rate are provided by the Office of Aviation Policy and Plans (APO), and is downloaded directly from the APO database.

Statistical Issues

None.

Completeness

The data are typically not finalized for 90 days following the close of the fiscal year. Surface event reports are reviewed on a daily basis to determine if the incident meets the definition of a runway incursion. Runway incursions are a subset of the incident data collected and the completeness of the data is based on the reporting requirements and completeness for each of the incident types.

If the operations data are not up to date, these calculations must be revised. The rate may also need to be recalculated if runway incursions are reported late. Historical volume data have been changed over the last three years, resulting in adjustments to current baselines.

Reliability

FAA uses performance data extensively for program management, personnel evaluation, and accountability in prioritizing its facility evaluations and audits. The data is also used on a daily basis to track progress of achieving performance goals. Annual runway incursion incident data are used to provide a statistical basis for research and analysis and outreach initiatives. The FAA verifies and validates the accuracy of the data through reviews or preliminary and final reports. Reconciliation of the databases is conducted monthly and anomalies are explored and resolved. In cases where major problems are identified, a request to re-submit is issued. The FAA conducts annual reviews of reported data and compares the data with data reported from previous years.

Reliability

FAA uses performance data extensively for program management, personnel evaluation, and accountability in prioritizing its facility evaluations and audits. The data is also used on a daily basis to track progress of achieving performance goals. Annual runway incursion incident data are used to provide a statistical basis for research and analysis and outreach initiatives. The FAA verifies and validates the accuracy of the data through reviews or preliminary and final reports. Reconciliation of the databases is conducted monthly and anomalies are explored and resolved. In cases where major problems are identified, a request to re-submit is issued. The FAA conducts annual reviews of reported data and compares the data with data reported from previous years.

PORTFOLIO OF GOALS
FY 2012 Methodology Report
FAA *Destination 2025* Performance Metrics

Federal Aviation Administration

NEXT LEVEL OF SAFETY
System Risk Event Rate (SRER)

FY 2012 Performance Target

Limit the rate of the most serious losses of standard separation to 20 or fewer for every thousand (.02) losses of standard separation within the National Airspace System.

Destination 2025 Outcome and Performance Metric

Outcome: Aviation risk is reduced through all phases of flight (gate-to-gate).

Performance Metric: Reduce risks in flight by limiting the rate of the most serious losses of standard separation to 20 or fewer for every thousand (.02) losses of standard separation within the National Airspace System.

Lead Organization: Air Traffic Organization

	FY 2008	FY 2009	FY 2010	FY 2011[1]	FY 2012
Target	N/A	N/A	N/A	20.00	20.00
Actual	N/A	N/A	N/A	24.54	TBD

[1] This was a new target for FY 2011. No prior year results are available.

Definition of Metric

Metric Unit: All instances of non-compliance with radar separation standards, termed Loss of Standard Separation, or LoSS.

Technical explanation for LoSS:

The non-compliant application of a prescribed radar separation standard, as defined in FAA Order 7110.65 or other national directive, for an operation under ATO services, including a pilot deviation, which results in less than the applicable separation minima between two or more airborne aircraft.

System Risk Event Rate (SRER):

The LoSS data will be compiled into the SRER, which is the rate of the most serious losses, for every thousand losses of standard separation within the system.

Computation: Rolling 12-month rate of serious losses of standard separation per thousand losses of standard separation.

Formula: $\Sigma(\text{Serious LoSS})/(\text{Number of LoSS Events})*1{,}000$

Scope of Metric: This metric will measure the separation compliance performance of radar controlled aircraft flying under Instrument Flight Rule. For FY 2009, this constituted approximately 26 million flights.

Method of Setting Target: The initial target of 20 was set based on a projection of SRER from historical Operational Error and Pilot Deviation data. The current SRER continues to fluctuate around 20. The target of 20 set for FY 2011 through FY 2014 will establish a baseline while deploying improved analysis and LoSS detection equipment. It will set a minimum level of system performance that should be attainable while

continuing an improving trend over historical performance.

Why the FAA Chooses this Metric

The ATO ensures that aircraft flying within the National Airspace System maintain required separation. With this new metric, FAA will be able to:

- Increase the amount of data collected and analyzed for better understanding of the associated risk,
- Align our approach to safety with our international partners,
- Integrate pilot and controller performance data on all air traffic incidents,
- Evaluate separation incidents caused by other factors, including pilot deviations,
- Avoid under-reporting and misclassification of incidents, and
- Facilitate the safe transition to NextGen.

Public Benefit

An increase in data reporting results in an increase in safety. A similar approach (increased data collection from pilots using the Aviation Safety Action Program) produced a dramatic decrease in the accident rate during the first part of the 21st century.

Partners

FAA's Air Traffic Organization (ATO) and Office of Aviation Safety (AVS).

External Factors Affecting Performance

None

Source of the Data

Source data for the SRER will be obtained through the reporting of LoSS in accordance with the FAA's directives, JO 7210.632, Air Traffic Occurrence Reporting, and JO 8020.16, Air Traffic Organization Aircraft Accident And Incident Notification, Investigation, And Reporting. Source data will be collected directly via the Comprehensive Electronic Data Analysis and Reporting (CEDAR) System and the Traffic Analysis and Review Program (TARP) from all FAA's ATO field air traffic control facilities. The ATO Office of Safety will be responsible for assuring the accuracy of this data and for maintaining records.

Statistical Issues

The data are not subjective and all identified LoSS events will be included in the SRER.

Completeness

The data are typically not finalized for 90 days following the close of the fiscal year. The FAA has implemented procedures and equipment that will automatically identify, report and validate all losses of separation, thereby removing the majority of the subjectivity and/or ability to filter the results.

Reliability

The data are reported through automation and is strictly calculated based on radar measurements. Reliability is based upon the performance of the automated tools, which were put in place during FY 2010.

FAA uses performance data extensively for program management, personnel evaluation, and accountability in prioritizing its facility evaluations and audits. The data are also used on a daily basis to track progress of achieving performance goals. Annual operational error incident data are used to provide a statistical basis for research and analysis. The FAA verifies and validates the accuracy of the data through reviews or preliminary and final reports. Reconciliation of the databases is conducted monthly and anomalies are explored and resolved. In cases where major problems are identified, a request to re-submit is issued. The FAA conducts annual reviews of reported data and compares them with data reported from previous years.

PORTFOLIO OF GOALS
FY 2011 Methodology Report
FAA *Destination 2025* Performance Metrics

Federal Aviation Administration

NEXT LEVEL OF SAFETY
Information Security

FY 2012 Performance Target

Ensure no cyber security event significantly degrades or disables a mission critical FAA system.

Destination 2025 Outcome and Performance Metric

Outcome: Aviation risk is reduced through all phases of flight (gate-to-gate).

Performance Target: Ensure no cyber security event significantly degrades or disables a mission-critical FAA system.

Lead Organization: Office of the Assistant Administrator for Information Services and Chief Information Officer, AIO

	FY 2008	FY 2009	FY 2010	FY 2011[1]	FY 2012
Target	0	0	0	0	0
Actual	0	0	0	0	TBD

[1] The description of the target was revised for FY 2011 from events that degrade "FAA services". The scope of the metric remains essentially unchanged, although it is now more specifically described. FAA has developed a list of Mission Critical Systems against which to measure success

Definition of Metric

Metric Unit: The number of disabling/degrading cyber events as determined by consensus between the Cyber Security Management Center (CSMC) and the other members of the National Airspace System (NAS) Cyber Incident Response Team (NCIRT), which is comprised of the Network Enterprise Management Center (NEMC), FAA Telecommunications Infrastructure (FTI), NAS Security Information Group (SIG), and FAA National Operations Control Center (NOCC).

Computation: The sum of the number of disabling/degrading cyber-attacks for each month as reported in the CSMC Monthly Target Status Report for the current fiscal year.

Formula: Number of cyber events that disabled or significantly degraded any FAA service equals zero.

Scope of Metric: The metric is applicable to the FAA Information Technology assets, defined by Internet Protocol (IP) based systems, which contribute to the delivery of FAA mission critical systems.

The FAA's information security infrastructure protects the agency's IT assets in accordance with applicable federal laws and regulations as well as DOT and FAA policy.

Method of Setting Target: The target was selected based upon the maturity level of the Information Systems Security Program and the expertise of the CSMC.

Why the FAA Chooses this Metric

Attackers seek to disrupt or exploit critical infrastructure across the United States. One critical infrastructure, as identified by the President in Homeland Security Presidential Directive/ HSPD-7, is our transportation system, including aviation. Accordingly, the FAA, whose mission is to ensure the safe and efficient movement of aircraft, must be protected against the threat of cyber-attacks. The Office of Information

Services (AIO) has the agency lead for ensuring that these attacks do not significantly degrade FAA mission critical systems.

Public Benefit

The benefit to the public is a safe and secure National Airspace System with no disruption of service due to cyber events.

Partners

The external partners who work with the agency to achieve this goal are commercial off the shelf (COTS) software and hardware vendors. These partners with their development and support staff keep our operating systems software used in the agency up to date and secure. In addition, our internal Line of Business partners administer and maintain the specific IP based systems that are deemed to be critical. The CSMC will monitor these IP based systems and will report to the internal LOB partners that they have been attacked. Both the CSMC and internal LOB partners will work together to determine the extent of any disruption to critical systems.

External Factors Affecting Performance

External factors include:

- Executive support to improve unified security visibility into the network,
- Funding in order to continually enhance technology to combat the evolving threat, and
- Attackers seeking to exploit software or infrastructure flaws in order to disrupt critical services.

Source of the Data

Data on cyber-security attacks are collectively identified and recorded by members of the NCIRT. The key indicator of the success of this performance target is the *Observed NAS Operations Impact Report,* produced by the NEMC and/or NOCC, and pertaining to cyber events for which the NCIRT has been activated. The final findings of the group will determine the root cause of the reported disruption or degradation. The NCIRT is only activated on an as-needed basis.

Statistical Issues

The ultimate determination of achievement of the performance target is a consensus of NCIRT members.

Completeness

The CSMC works collaboratively to validate cyber security incidents on FAA and Departmental systems. It uses current and historical data to validate trends, which indicates a change in the number, complexity and probability of cyber-attack success. The CSMC's collaboration with other NCIRT members provides insight into all FAA official mechanisms for the detection and impact measurement of cyber security incidents.

Reliability

The process for making the determination that an attack has significantly degraded a mission-critical system is captured in the Cyber Event Management (CEM) Incident Response (IR) Procedures. AIO's ability to implement this performance measurement depends on the perspective of NCIRT members, federal guidelines, and OMB funding approval.

PORTFOLIO OF GOALS
FY 2012 Methodology Report
FAA Destination 2025 Performance Metrics

Federal Aviation Administration

NEXT LEVEL OF SAFETY
Commercial Space Launch Accidents

FY 2012 Performance Target

No fatalities, serious injuries, or significant property damage to the uninvolved public during licensed or permitted space launch and reentry activities.

Destination 2025 Outcome and Performance Metric

Outcome: There are no fatalities resulting from commercial space launches.

Performance Metric: No fatalities, serious injuries, or significant property damage to the uninvolved public during licensed or permitted space launch and reentry activities.

Lead Organization: Commercial Space Transportation

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
Target	0	0	0	0	0
Actual	0	0	0	0	TBD

Definition of Metric

Metric Unit: Number of accidents resulting in fatalities, injuries, or significant property damage.

Computation: The number of accident occurrences is calculated.

Formula: Count of the number of occurrences.

Scope of Metric: This metric focuses only on commercial space launch or reentry activities licensed or permitted and monitored by the FAA. "Significant" property damage is defined as any damage estimated to exceed $25,000 to property not associated with flight. On board crew members and space flight participants are NOT considered "uninvolved" members of the public.

Method of Setting Target: Space launch is inherently risky. Over the past 25 years there have been no fatalities, serious injuries or significant property damage. A metric of zero was set to maintain that record.

Why the FAA Chooses this Metric

Protecting the uninvolved public during launch operations is an FAA safety mission objective. Commercial space transportation is the means by which payloads such as satellites and remote sensing devices are carried to orbit; these payloads have tremendous benefit to our society. Commercial space launch or reentry accidents can potentially have major catastrophic consequences, involving large losses of life and property. The uninvolved public expects to be protected from the potential dangers and hazards associated with commercial space launch and reentry activities. There has not been a single commercial space launch accident since the first DOT licensed launch took place in 1989, and DOT is working to keep this safety record perfect.

Public Benefit

AST's oversight of the commercial space launch industry activities resulted in no loss of life or property damage to the uninvolved public.

Partners

Department of Defense, NASA, Commercial Space Industry. All entities work in partnership to ensure protection of the public, property and national security and foreign policy interests of the U.S.

External Factors Affecting Performance

Use of advanced technologies may increase risk. Misrepresentations from licensee could result in inaccurate identification of hazards that may affect public safety.

Source of the Data

The source of the data is the Office of the Associate Administrator for Commercial Space Transportation (AST). Specifically, AST monitors all licensed launch operations and maintains documented reports of each licensed event. These reports are generated by AST's assigned field inspectors and duty officers for each launch event. They include all relevant details pertaining to the outcome of the licensed launch or reentry operation, including the occurrence of any public fatalities, injuries, or property damage. AST will utilize other sources of data such as the launch vehicle operator, and federal, local and State government officials.

Statistical Issues

None.

Completeness

AST's Licensing and Safety Division maintains and verifies reports that an accident resulting from a licensed or permitted launch operation has occurred. The Division supports coordination with other federal agencies, including the National Transportation Safety Board (NTSB) and the military, on any subsequent investigations.

Reliability

If an accident occurs, the FAA and the NTSB will complete official reports fully documenting circumstances associated with the event.

PORTFOLIO OF GOALS
FY 2012 Methodology Report
FAA *Destination 2025* Performance Metrics

Federal Aviation Administration

DELIVERING AVIATION ACCESS THROUGH INNOVATION
Major System Investments

FY 2012 Performance Target

In FY 2012, maintain 90 percent of major system investments within 10 percent variance of current acquisition program baseline (APB) total budget at completion.

Destination 2025 Outcome and Performance Metric

Outcome: NextGen capabilities are fully implemented and utilized based on U.S. aviation community system needs.

Performance Metric: Maintain 90 percent of major system investments within 10 percent variance of current acquisition program baseline total budget at completion.

Lead Organization: AFN

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012[1]
Target	N/A	N/A	N/A	N/A	90%
Actual	N/A	N/A	N/A	N/A	TBD

[1] This is a new metric for FY 2012 – no prior year data are available.

Definition of Metric

Metric Unit: Percentage of Acquisition Program Category 1,2, and 3 programs within 10 percent of the investment's total established acquisition program baseline budget-at-completion value. The number of baselined programs will be established at the beginning of each fiscal year.

Computation: Cost performance for each Major Investment program is measured by comparing the total budget-at-completion amount established with the approved Acquisition Program baseline with most recent Estimate-at-completion projection. Any Major Investment program with a total budget-at-completion variance of more than 10 percent is considered to not have met the established fiscal year cost performance goal.

Formula:

$$\frac{\text{Baseline Budget-at-Completion Amount}}{\text{Baseline Estimate-at-Completion Projected Amount}} \times 100$$

Scope of Measure: Major Investment programs are FAA Acquisition Program Categories 1, 2 and 3 that have an approved acquisition program baseline. The designation of "major system investments" in the title of this performance target expresses programs with total F&E costs greater than $100 million. For FY 2012 the projected number of baselined category 1, 2 and 3 programs is eighteen (18).

Method of Setting Target: Maintaining the 90 percent target each year ensures that FAA demonstrates its commitment to meet program cost goals through benchmarks using a 90% target parameter that is well established across government agencies.

Why the FAA Chooses this Measure

The Major System Investments 90 percent target represents a progressive measure for each fiscal year of the performance of FAA acquisition programs. This performance measure began in FY 2003, and will continue each fiscal year through the completion of the acquisition of selected programs. The performance target increased each year until it reached 90 percent threshold in FY 2008. This progressive increase from

80 percent in FY 2003 to 90 percent in FY 2008 has ensured that FAA's acquisition performance remains consistent with targets set in *The Department of Transportation Strategic Plan*.

Public Benefit

FAA's ability to keep major investments within budget goals will allow for the efficient management, completion and transition to NextGen programs. The transition to NextGen involves acquiring numerous systems to support precision satellite navigation, networked digital communications, integrated weather information, and layered, adaptive security.

Partners

FAA Organizations

External Factors Affecting Performance

None.

Source of the Data

FAA organizations track and report status of all investments acquisition program baseline targets using an automated database. FAA organizations provide a monthly qualitative and quantitative assessment that indicates their confidence level in meeting established goals. Comments are provided monthly that detail problems, issues, and corrective actions, and ensure budgets are maintained within the targets. Status is reported monthly at the FAA's Performance Subcommittee meetings. A variance to the measure will be triggered through the completion of a Baseline Management Notice (BMN) that reflects a baseline variance. If a program breaches its APB budget baseline by 10 percent the variance will be recorded in the fiscal year being measured and applied to the 90 percent Acquisition Performance Goal.

Statistical Issues

The programs that are selected each fiscal year represent a cross section of programs within the FAA. They include programs that have an Acquisition Category 1, 2, or 3 and have established an Investment Decision Authority (IDA) approved Acquisition Program Baseline (APB).

Completeness

This measure is current with no missing data. Each DOT organization maintains its own quality control checks for cost, schedule, and technical performance data of each major systems investment in accordance with OMB Circulars A-11, A-109, and A-130, Federal Acquisition Regulations, and Departmental orders implementing those directives and regulations.

Reliability

Each DOT organization having major system investments uses the data during periodic program reviews, for determining resource requests. They are also used during the annual budget preparation process, for reporting progress made in the President's budget and for making key program management decisions. Monthly status is reported through the SPIRE database and included in monthly high-level management reviews. Once the program is selected and approved for tracking purposes it is reported on with detailed commentary each month, and assigned a Red, Yellow, or Green Confidence indicator that the cost is within the 10% threshold. These detailed reports are reviewed at all levels of the appropriate Service Unit, Executive levels within the ATO, and the FAA Administrator.

PORTFOLIO OF GOALS
FY 2012 Methodology Report
FAA *Destination 2025* Performance Measures

Federal Aviation Administration

AVIATION ACCESS THROUGH INNOVATION
LPV Procedures

FY 2012 Performance Measure

Publish 500 LPV or LP procedures in FY2012 to ensure Localizer Performance (LP) or Localizer Performance w/Vertical (LPV) procedures are available at 2218 runways in the NAS.

Destination 2025 Objective and Performance Target

Outcome: Air navigation infrastructure and associated systems are flexible, reliable, cost effective, and secure.

Performance Measure: Ensure Localizer Performance with Vertical Guidance (LPV) or Localizer Performance (LP) procedures are available at 5,218 runways in the NAS by 2018.

Lead Organization: Air Traffic Organization

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012[1]
Target	N/A	N/A	N/A	N/A	500
Actual	N/A	N/A	N/A	N/A	TBD

[1] This is a new measure for FY 2012. No prior year data are available.

Definition of Measure

Unit of Measure: The number of LPV or LP procedures published during each 56 publication cycle.

Computation: Direct counting of LPV and LP procedures produced.

Formula: The rate of 500 procedures per year is based on the achievable production rate of committed to by Aero Nav Services and AVN

Scope of Measure: As of July 2011, 2555 LP/LPV procedures have been published. Publish 500 procedures annually until all qualifying runway ends are completed.

Method of Setting Target: The target level of 500 procedures per year is based on the rate necessary to complete all 5218 qualifying runways in the NAS by 2018, consistent with the WAAS BCAR.

Why the FAA Chooses this Measure

This measure quantifies unencumbered access to the NAS for the aviation users. LPV and LP procedures can be published at any qualifying runway to provide ILS-like capability at a fraction of the legacy ILS infrastructure costs.

Public Benefit

Vertically guided approach procedures provide a safety benefit to all users compared to non-precision approach services. In addition because LPV or LP procedures can be published at any qualifying runway, users obtain a significant access benefit over ILS. As of July 2011, there are twice as many LPV/LP procedures than ILS.

Partners

Aero Nav Service publishes the LPV/LP approach procedures, AIM/NFDC provides the data management and contracting infrastructure necessary for AJW-913 to procure obstacle surveys, ARP provides a portion of the funding for obstacle surveys through the AGIS program, AFS provides quality oversight of the process.

External Factors Affecting Performance

A key enabler is the survey procurement and data management services provided by AIM. All runways that will have an LPV procedure must have an obstacle survey completed in the year prior to the procedure production to ensure all obstacles that could affect the minimums are identified. The obstacle data is provided to Aero Nav Services and AVN by AIM/NFDC

Source of the Data

Performance data for this measure come from Aero Nav Services and Aviation System Standards (AVN), and the National Flight Data Center (NFDC).

Statistical Issues

There are no statistical data measurement errors for this measure

Completeness

Data for this measure is provided on a 56 day update cycle as part of the established publication process by Aero Nav Services, AVN, and NFDC.

Reliability

The measures are directly counted from data managed by NFDC and are considered 100% reliable

PORTFOLIO OF GOALS
FY 2012 Methodology Report
FAA *Destination 2025* Performance Metrics

Federal Aviation Administration

SUSTAINING OUR FUTURE
Noise Exposure

FY 2012 Performance Target

Reduce the number of people exposed to significant aircraft noise to less than 386,000 in calendar year 2012.

Destination 2025 Outcome and Performance Metric

Outcome : Community noise concerns are not a significant constraint on growth.

Performance Metric: The U. S. population exposed to significant aircraft noise around airports has been reduced to less than 300,000 persons.

Lead Organization: Aviation Policy, Planning, Environment and International

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012[1]
Target	455,000	436,000	419,000	402,000	386,000
Actual	386,662	296,527	323,039	307,420	TBD

[1]For FY 2012, targets and results for this metric were changed from percent of population exposed to the number of persons exposed. The prior years' targets and results have been recalculated from the original percentages.

Definition of Metric

Metric Unit: Number of persons exposed to significant aircraft noise. Significant aircraft noise levels as currently defined as values greater than or equal to 65 decibels dB Day Night Sound Level (DNL). The target is determined by reducing the 2005 population exposed to significant aircraft noise by 1 percent in 2006, and by a 4 percent compounded rate from 2007 to 2018.

Computation: The estimates of the number of people exposed to significant noise are calculated from the Model for Assessing Global Exposure to the Noise of Transport Aircraft (MAGENTA). The computational core of MAGENTA is FAA's Integrated Noise Model (INM), the most widely used computer program for the calculation of aircraft noise around airports. Major assumptions on local traffic utilization come from obtaining INM datasets that were developed for an airport.

The MAGENTA model calculates individual DNL contours for the top 95 US airports using INM. The contours are superimposed on year 2000 Census population densities projected to the current year to calculate the number of people within the DNL 65 dB contour at each airport. For smaller airports, a procedure is used where contour area is calculated from airport operations data using a statistical relationship. The contours areas are then used to calculate people exposed using 2000 Census population densities projected to the current year. The projection is used to account for population growth between 2000 and the current year. The individual airport exposure data are then summed to the national level. Finally, the number of people relocated through the Airport Improvement Program is subtracted from the total number of people exposed.

The U.S. MAGENTA incorporates INM version 7.0. In addition, military operations for the KC-135 were updated based on more accurate information from the Air Force. Older, louder KC-135's are being phased out of service, producing smaller contours at

some airports.

Formula: The number of people exposed to significant aircraft noise is calculated as follows:

$$\sum_{i=1}^{n} POP65_i - \sum_{j=1}^{9} POPREL_j$$

Where, $POP65_i$ is the number of people residing in the DNL 65 dB contour at the i^{th} "Noise Inventory" airport as of the current year projected from the 2000 Census, and n is the number of Noise Inventory airports. A Noise Inventory airport is defined as any airport that reported having at least 365 jet departures for the year being used in the analysis. $POPREL_j$ is the number of people relocated from the DNL 65 dB contour in the j^{th} FAA region since the year 2000.

Scope of Metric: The metric tracks the residential population exposed to significant aircraft noise around U.S. airports. Significant aircraft noise is defined as aircraft noise above a Day-Night Sound Level (DNL) of 65 decibels. In 1981, FAA issued 14 CFR Part 150, Airport Noise Compatibility Planning, and as part of that regulation, formally adopted Day Night Sound Level. Day Night Sound Level, abbreviated as DNL and symbolized as Ldn, is the 24-hour average sound level, in db, obtained from the accumulation of all events with the addition of 10 decibels to sound levels in the night from 10 PM to 7 AM. The weighting of the nighttime events accounts for the increased interfering effects of noise during the night when ambient levels are lower and people are trying to sleep.

In the promulgation of 14 CFR Part 150, FAA also published a table of land uses that are compatible or incompatible with various levels of airport noise exposure in DNL. This table established that levels below DNL 65 dB are considered compatible for all indicated land uses and related structures without restriction.

Method of Setting Target: The target was set by analyzing the historical rate of change of noise exposure and taking into account recent events and long term projections of air traffic demand. As air traffic grows over time, noise exposure is likely to move upwards. The target will continue to be re-assessed as we take a more integrated approach to environmental regulation – assessing the relative costs and benefits of noise, local air quality, and greenhouse gas emissions – and the trade-offs in achieving reductions in each.

Why the FAA Chooses this Metric

Mitigating noise directly impacts our ability to increase capacity while sustaining our future. Although building new runways is the best way to increase capacity, communities and local government are reluctant to build them if they impose increased aircraft noise exposure. By mitigating and reducing exposure to excessive noise, FAA can help communities accept more runways in their areas.

The number of people exposed to significant noise levels was reduced by about 90 percent between 1975 and 2000. This is due primarily to the legislatively mandated transition of airplane fleets to newer generation aircraft that produce less noise. Most of the gains from quieter aircraft were achieved by FY 2000. The remaining problem must be addressed primarily through airport-specific noise compatibility programs. The FAA pursues a program of aircraft noise control in cooperation with the aviation community. Noise control measures include noise reduction at the source, i.e., development and adoption of quieter aircraft, soundproofing and buyouts of buildings near airports, operational flight control measures, and land use planning strategies. The FAA is authorized to provide funds for soundproofing and residential relocation, but each project must be locally sponsored and be part of a noise compatibility program prepared by the airport sponsor and approved by FAA.

The base year for setting the target is 2005. This base year was selected starting with FY 2010 to account for the significant changes to the commercial fleet from the previous baseline. The target remains at a rate of reduction of one percent in 2006 and a four percent compounded reduction from 2007 to present.

Environmental trends based on expansion of the U.S. air transportation system show that noise exposure is likely to move upwards as traffic growth continues – even taking into account forecasted fleet changes and implementation of beneficial new air traffic procedures. The agency's ability to develop next generation technologies and have the broadest possible array of available noise mitigation approaches at its disposal will

affect FAA's ability to continue making significant improvements in aviation noise exposure.

Public Benefit

Public benefit is reduced exposure to unwanted aircraft noise and increased capacity, reducing airport congestion and delays.

Partners

Partners include government agencies worldwide and the aviation industry through the International Civil Aviation Organization (ICAO), who periodically update noise standards and methodologies. The FAA has also partnered with NASA in the development of continuous lower energy, emissions and noise (CLEEN) technologies for civil subsonic jet airplanes to help achieve NextGen goals to increase airspace system capacity by reducing significant community noise and air quality emissions impacts in absolute terms and limiting or reducing aviation greenhouse gas emissions impacts on the global climate.

External Factors Affecting Performance

The primary external factors affecting performance are market forces that drive changes in commercial aircraft fleets and operations. Other external factors include providing FAA the authority and funding to accelerate the implementation of new aircraft emissions and noise technology, and providing funding to FAA's Airport Improvement Program. These programs help foster the type of fleet and performance change required to meet either our current target or historic experience.

Source of the Data

The Model for Assessing Global Exposure to the Noise of Transport Airplanes, MAGENTA, is used to track airport noise exposure. MAGENTA uses updated population data from the 2000 Census projected to the current year to account for population growth. The data source for airport traffic is FAA's Enhanced Traffic Management System (ETMS). This database has replaced the original source, the Official Airline Guide (OAG). Unlike the OAG, the ETMS database includes unscheduled air traffic, which allows for more accurate modeling of freight, general aviation, and military operations. The ETMS also provides more details on aircraft type for a more accurate distribution of aircraft fleet mix.

Since ETMS does not provide future data on flight operations, FAA uses the Terminal Area Forecast (TAF). TAF provides information on how operations will increase on an airport specific basis. Therefore, the current year's result is classified as preliminary until the following year when projected data are finalized, based on actual numbers of operations. Data on the number of people relocated through the Airport Improvement Program are collected from FAA regional offices. Local traffic utilization data are collected from individual airports and updated periodically.

A task group formed to develop MAGENTA by the Committee on Aviation Environmental Protection (CAEP) under the International Civil Aviation Organization (ICAO) has thoroughly reviewed the model's population exposure methodology and has validated it for several airport specific cases. MAGENTA played an important role in the setting of new international aircraft noise standards by CAEP in 2001. CAEP has used MAGENTA to assess the benefits (reduction in number of people exposed to aircraft noise) of several noise stringency proposals.

Statistical Issues

This metric is derived from model estimates that are subject to errors in model specification. Trends of U.S. noise exposure may change due to annual improvements to the noise exposure model. A major change to MAGENTA (Model for Assessing the Global Exposure of Noise because of Transport Airplanes) would result in a significant change in the estimate of the number of people exposed to significant noise levels around US airports. Improvements to the estimate of the number of people exposed to significant noise levels will continue as FAA plans to replace MAGENTA with the Aviation Environmental Design Tool (AEDT).

Completeness

No actual count is made of the number of people exposed to aircraft noise. Aircraft type and event level are current. However, some of the databases used to establish route and runway utilization were developed from 1990 to 1997. Changes in airport layout including expansions may not be reflected. The FAA continues to update these databases as they become available. The benefits of federally funded mitigation, such as

buyout, are accounted for.

The noise studies obtained from U.S. airports have gone through a thorough public review process, either under the National Environmental Policy Act (NEPA) requirements or as part of a land use compatibility program.

Performance metric data for the current year (forecasted data) are calculated and reported during the period of July and August, and the data are finalized by May of the following reporting year.

Reliability

The Integrated Noise Model (the core of the MAGENTA model) has been validated with actual acoustic measurements at both airports and other environments such as areas under aircraft at altitude. External forecast data are from primary sources. The MAGENTA population exposure methodology has been thoroughly reviewed by an ICAO task group and was most recently validated for a sample of airport-specific cases.

PORTFOLIO OF GOALS
FY 2012 Methodology Report
FAA *Destination 2025* Performance Metrics

Federal Aviation Administration

SUSTAINING OUR FUTURE
NAS Energy Efficiency

FY 2012 Performance Target

Improve aviation fuel efficiency by 14 percent, as measured by the calendar year 2010 fuel burned per revenue mile flown, relative to the calendar year 2000 baseline.

Destination 2025 Outcome and Performance Metric

Outcome : Aviation's carbon footprint does not become a constraint to growth.

Performance Metric: Improve NAS energy efficiency (fuel burned per miles flown) by at least 2 percent annually.

Lead Organization: Policy, International Affairs & Environment

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
Target	-8%	-9%	-10%	-12%	-14%
Actual	-13.52%	-14.03%	-15.25%	-14.50%	TBD

Definition of Metric

Metric Unit: Fuel burned per mile flown.

Computation: Measuring and tracking fuel efficiency from commercial aircraft operations allows FAA to monitor improvements in aircraft/engine technology and operational procedures, as well as enhancements in the airspace transportation system. The FAA measures performance against this target using the Aviation Environmental Design Tool (AEDT). AEDT is a FAA-developed computer model that estimates aircraft fuel burn and emissions for variable year emissions inventories and for operational, policy, and technology-related scenarios. For this target, AEDT is used to generate annual fuel burn and total distance flown data for all U.S. commercial operations.

Formula:

$$\frac{\text{Fuel Burn (Tg)}}{\text{Distance (billions of kilometers)}}$$

(Fuel Burn values in Teragrams, Tg, where 1 Tg = 10^{12} grams)

Scope of Metric: This metric focuses on all U.S. commercial operations.

Method of Setting Target: Fuel efficiency target was selected based upon knowledge of the factors that most accurately characterize commercial aircraft fleet fuel efficiency. The data that underlie this target can be assessed in terms of aircraft and engine technology, fleet turnover, and air traffic management procedures that influence routes and schedule.

Why the FAA Chooses this Metric

Measuring and tracking fuel efficiency from aircraft operations allows FAA to monitor improvements in aircraft/engine technology and operational procedures, and enhancements in the airspace transportation system. This information provides an assessment of their influence on reducing aviation's emissions contribution.

Public Benefit

Today's aircraft are up to 70 percent more efficient than early commercial jet aircraft. However there is growing concern over aviation's impact on the environment and public health. Aviation is currently viewed as a relatively small contributor to those emissions that have the potential to influence air quality and global climate. Carbon dioxide (CO_2) emissions are a primary greenhouse gas and are directly related to the fuel burned during the aircraft's operation. As air traffic grows, this contribution will increase without improvements in technology, more efficient air traffic operations, and renewable fuels.

This metric supports the development of these improvements to reduce aviation's impact on the environment and thereby improve public health and welfare. In addition, more fuel efficient aircraft should contribute to improving the financial well-being of commercial airlines and a growing economy.

Partners

The National Aeronautics and Space Administration (NASA) works with FAA to conduct research and development , identifying engine and airframe technologies that offer potential for reducing fuel burn and emissions. The Aerospace Industries Association works with FAA and NASA to commercialize technologies from the research phase and develop operational procedures to address environmental impacts. The Air Transport Association works with FAA to identify fleet and air traffic procedural changes that improve fuel efficiency.

External Factors Affecting Performance

NAS Energy Efficiency is heavily dependent on commercial airline operating procedures and day-to-day operational conditions. This includes operating fleet and route assignments, air traffic conditions, weather, airport operating status, congestion in the system, and any disruptions that introduce delay in scheduled flights. For example, a major sustained disruption or enhancement in air traffic and/or a significant shift in commercial operations amongst airlines, including changes in fleet composition and missions could have a profound impact upon achieving the performance target.

Source of the Data

The AEDT uses radar-based data from the Enhanced Traffic Management System (ETMS) and Official Airline Guide (OAG) schedule information to generate annual inventories of fuel burn and total distance flown data for all U.S. commercial operations.

Statistical Issues

Potential seasonal variability and variability from year-to-year can be expected when analyzing air traffic data and commercial operations.

The extent to which enhancements are incorporated to improve model accuracy, for example via more robust aerodynamic performance modeling algorithms and database of aircraft/engine fuel burn information, will impact the overall results and thus the performance target. This could create some statistical variability from year-to-year if not properly taken into account. In cases where such enhancements have the potential to create a significant shift in baseline, annual inventories may need to be re-processed and/or adjusted to ensure consistency and accuracy of results.

The extent to which aircraft fleet improvements cannot be sufficiently modeled because of a lack of manufacturer proprietary data may also influence the performance target results. In this case, attempts will be made to characterize such aircraft with the best publicly available information, recognizing that newer aircraft types in the fleet will likely exist in significantly lesser numbers, thus minimizing the influence upon the results.

Completeness

Data used to measure performance against the target are assessed for quality control purposes. Input data for the AEDT model are validated before proceeding with model runs. Radar data from the ETMS are assessed to remove any anomalies, check for completeness, and pre-processed for input to the AEDT model. ETMS data are verified against the OAG information in order to avoid any duplication of flights in the annual inventory.

In some cases, ETMS data lack appropriate fields to conduct quality control and in these cases the data are removed. Data from the AEDT model are verified by comparing output from previous years and analyzing trends to ensure that they are consistent with expectations. In other cases monthly inventories may be analyzed to validate the results. Model output is subsequently post-processed through spreadsheets to

perform the calculations for the performance target. Formulae and calculations are checked in order to ensure accuracy.

Full documentation of this target is determined when the annual inventories have been accomplished and the post-processing calculations have been completed, resulting in a percentage reduction in fuel consumption per miles flown (or increase in fuel efficiency) relative to the baseline. The standard for this documentation is set by FAA's Office of Environment and Energy, which is separate from the organization (DOT Volpe National Transportation Systems Center) responsible for input and output associated with the AEDT model runs and annual inventories.

Reliability

The measuring procedure used for this performance target is highly reliable. That is to say that the processing of data through the AEDT model including the performance of algorithms is not subject to random factors that could influence the results. However, as mentioned above, this performance target is potentially influenced by factors outside the control of FAA.

We do not expect increases in fuel burn or decreases in distance traveled or both to degrade the fleet fuel efficiency significantly. Further, we do not expect this to prevent us from meeting the FY 2012 target. However, we do expect that in the future, aircraft and engine technology improvements or air traffic management improvements or both may not be enough to offset traffic growth, congestion and delays. In addition, the current metric for measuring and tracking fuel efficiency may not adequately capture performance to the degree that would allow future decisions on technological and operational considerations. As we continue to review the impact of improvements on air traffic management and changes in operational trends, we will also assess the need for revised performance metrics for future targets.

PORTFOLIO OF GOALS
FY 2012 Methodology Report
FAA *Destination 2025* Performance Metrics

Federal Aviation Administration

GLOBAL COLLABORATION
World-wide Fatal Aviation Accidents

FY 2012 Performance Metric

In FY 2012, limit world-wide fatal accidents in Part 121-like operations to no more than 20 fatal accidents per million revenue aircraft departures.

Destination 2025 Outcome and Performance Metric

Outcome : Reduce aviation accidents and fatalities worldwide.

Performance Metric: By 2018, the World-wide fatal aviation accident rate declines 10% compared to 2010.

Lead Organization: Aviation Safety

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
Target Rate	N/A	N/A	N/A	N/A	20
Actual Rate	N/A	N/A	N/A	N/A	TBD

Definition of Metric

Metric Unit: Number of world-wide fatal accidents in Part 121-like operations per million revenue aircraft departures.

Computation: Number of world-wide fatal accidents in Part 121-like operations divided by part 121-like operation departures

Formula: FY 2012 Target: Number of World-Wide Fatal Accidents in Part 121-Like Operation

FY 2018 10% decline target:

$$\frac{\text{Number of World-Wide Fatal Accidents in Part 121-Like Operation}}{\text{Part 121-Like Aircraft Departures per 1,000,000}}$$

Scope of Metric: The metric will address only FAR "Part 121-like" operations. Part 121-like accident captures the following types of flights:

- Scheduled passenger flights in aircraft with 10 or more passenger seats.
- Non-scheduled passenger flights in aircraft with 30 or more passenger seats.
- All cargo flights in aircraft with 7,500 pounds of payload or more. This roughly corresponds to those passenger aircraft that typically have 30 or more seats.

Part 121-like EXCLUDES the following types of flights.

- Non-scheduled passenger flights in aircraft with 10 to 30 passenger seats. Those flights correspond to on-demand part 135 flights.
- All passenger flights in aircraft with fewer than 10 seats. Those flights correspond to scheduled part 135.
- Cargo flights in aircraft with less than 7,500 pounds payload. Those flights correspond to on-demand part 135 flights.

Those operations are synonymous with general public notions of passenger and cargo "airlines" in the United States. This measure excludes fatal accidents involving turbulence and ramp events because they are not reported consistently in much of the world.

Method of Setting Target: The target was set based on past trends. The trend has increased over the past 5 years. The target for 2018 implies a target in 2025 that is 18% below the FY08 to FY10 baseline average of 0.640. The 2018 target could prove to be a challenge, as most of the safest nations will experience

only modest growth rates, while more rapid growth rates can be expected in other regions of the world. For tracking purposes, a target number estimate is established each year. The number is based on a currently estimated annual 3% per year growth for departures. The FY 2012 target rate of 0.623 equates to 20 fatal accidents.

Why the FAA Chooses this Metric

FAA chooses this goal because American citizens travel on airlines throughout the world and a safe international system contributes to global economic growth, including growth in the U.S.

Public Benefit

The public will benefit from safer travel on foreign air carriers and from the economic contributions of a safe international aviation system.

Partners

Partners will include the International Civil Aviation Organization, selected national governments, mainframe manufacturers, the Commercial Aviation Safety team, and regional cooperative organizations.

External Factors Affecting Performance

The effort could be negatively affected by a failure to fund international efforts within AVS, such as "shadow certification" with airframe manufacturers and AVS outreach.

Source of the Data

Fatal accidents will be identified from several respected sources of data on international accidents, including the United Nation's ICAO, two commercial sources, and national databases from selected countries whose investigative authorities provide significant assistance to other countries, including the US NTSB, BEA of France, AAIB of the UK, and Australia's ATSB. However, total flight departures for the most current year at any time must rely on an estimate, based largely on industry press because preliminary data will not be available until approximately 6 months into the following fiscal year. In contrast, accident information should be essentially complete shortly after the end of each fiscal year, though minor adjustments to those data may be required as more complete data become available.

Statistical Issues

Statistical issues include timely availability of departure for the most recently completed fiscal year.

Completeness

Accident data will be precise and complete, and easily duplicated. The data on revenue aircraft departures will be equally universal. Combined, the data will yield fatal accident rates, which are the most commonly cited measure of fundamental safety throughout the world.

Reliability

Political-economic factors are beyond the direct influence of FAA or of the aviation community could influence results. Severe political or economic upheaval in any of several key aviation markets could negatively affect results, while better than expected positive changes in governance and wealth could strengthen results.

PORTFOLIO OF GOALS
FY 2012 Methodology Report
FAA *Destination 2025* Performance Metrics

Federal Aviation Administration

WORKPLACE OF CHOICE
FAA Ratings by Employees

FY 2012 Performance Target

75th percentile rank in the Best Places to Work (BPTW) Index for Federal Agencies Subcomponents.

Destination 2025 Outcome and Performance Metric

Outcome : FAA is widely recognized as a workplace of choice.

Performance Metric: The FAA is rated in the top 25 percent of places to work in the federal government by employees.

Lead Organization: Human Resources

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
Target[1]	N/A	N/A	N/A	N/A	75%
Actual	N/A	N/A	83%	TBD	TBD

[1]This is a new metric for FY 2012. The FY 2010 result is included here as a basis for comparison. The actual result for FY 2011 will be available after September, 2011.

Definition of Metric

Metric Unit: FAA's percentile rank in the Partnership for Public Service (PPS) Best Places to Work (BPTW) Index results for Federal Agencies Subcomponents. The long term target is a specific percent percentile rank value, as are the interim targets.

Computation: The Partnership for Public Service (PPS) obtains the Employee Viewpoint Survey (EVS) data from the Office of Personnel Management (OPM) and calculates the BPTW Index results. PPS ranks FAA's index result among the results for other federal agency subcomponents (e. g., components of the Department of Defense). FAA's percentile rank is based on its rank divided by the total number of federal agency subcomponents.

Formula: The BPTW Index result for FAA will be an average of FAA's percent positive results for EVS items 40, 69, and 71, as calculated by PPS. (Item numbers are those in the EVS 2010 survey – see Scope of Metric below for item descriptions.)

FAA 's percentile rank =

((FAA's numerical rank)/(number of ranked federal agencies subcomponents)) times 100.

For 2010, FAA's rank was 187 out of 224 federal agencies subcomponents, therefore it rank was (187/224)*100 = 83%.

Scope of Metric: The items used are indicators of employees' job and organizational satisfaction and PPS selected this combination of items for its overall index, based on statistical modeling of EVS results. The BPTW Index items are:

Item 40. I recommend my organization as a good place to work.

Item 69. Considering everything, how satisfied are you with your job?

Item 71. Considering everything, how satisfied are you with your organization?

Method of Setting Target: The 2018 target was selected relative to the 2010 baseline to set a stretch goal given typical trends in employee survey results.

Why the FAA Chooses this Metric

The BPTW is used to rank federal agencies and the rankings receive a lot of attention from Congress, the press and other stakeholders. It is often the most well publicized EVS result.

Public Benefit

Improvements in EVS results that are used to calculate the BPTW rankings would indicate that FAA is managing its workforce better. Research indicates that improved employee survey results are associated with higher organizational performance.

Partners

The FAA leadership, including executives, managers, and supervisors need to work collaboratively to improve BPTW Index results, particularly in the larger organizations, and all must be held accountable.

External Factors Affecting Performance

Factors such as Congressional decisions, negative press articles can affect employees' attitudes governmentwide and within FAA. FAA's BPTW Index rank depends, in part, on the EVS results for other federal agencies, since a ranking is a comparison.

Source of the Data

OPM administers the EVS Survey, maintains the database and provides the official results and reports for the whole government and individual agencies. The Partnership for Public Service (PPS) obtains the Employee Viewpoint Survey (EVS) data from OPM and calculates the BPTW Index results and rankings.

Statistical Issues

FAA's results are based on a stratified sample of FAA employees and are subject to sampling error. There may also be error due to differences in the attitudes of the employees who respond to the survey and those who do not. For these reasons, it may take several years before an overall trend emerges.

Completeness

The Workplace of Choice Goal indicates that the core concept is that current and potential employees have positive views of FAA as a place to work. The BPTW index directly measures employees' attitudes with respect to job and organizational satisfaction. The EVS is administered and the results are analyzed using the highest professional standards.

Reliability

See above information on statistical issues concerning sampling error for the EVS.

PORTFOLIO OF GOALS
FY 2012 Methodology Report
FAA *Destination 2025* Performance Metrics

Federal Aviation Administration

WORKPLACE OF CHOICE
Outside Ratings

FY 2012 Performance Target

Achieve a 90 percent success rate in the areas of financial management and human resources management.

Destination 2025 Outcome and Performance Metric

Outcome: FAA is widely recognized as a workplace of choice.

Performance Measure: Achieve a 90% success rate in the areas of financial management and human resources management:

- Receive annual Unqualified Audits with no material weaknesses.
- Maintain the competitive status of all FAA employees within the federal personnel system.
- Improve the "effective leadership" index score on the OPM Employee Viewpoint Survey by 8 percent.
- Improve the "talent management" index score on the OPM Employee Viewpoint Survey by 8 percent.

Lead Organization: Human Resources

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012[1]
Target	N/A	N/A	N/A	N/A	90% success rate
Actual	N/A	N/A	N/A	N/A	TBD

1 This is a new measure for FY 2012 – no prior year data are available.

Definition of Metric

Metric Unit: The metric unit is the change in the weighted scores of the four components of this performance measure (financial management, human resources management, and the OPM indices for talent management and leadership). The baseline is derived using results from FY 2008 for the OPM audit of FAA's personnel system, the FY 2010 opinion of the independent audit of FAA's financial statements, and FY 2010 Employee Viewpoint Survey (EVS) results for the talent management and leadership indices.

Computation: The end-of-year result is computed by calculating the sum of weighted scores for the four components. To achieve a 90 percent success rate, the scores of the financial management and human resources management components must be perfect to contribute 40 percent each of the total, while the index scores will be weighted at 10 percent each.

Formula: Weighted sum (40 percent for the auditor's opinion on FAA's annual financial statement; 40 percent value for OPM audit; and 10 percent each for the EVS survey items on leadership and talent management).

Scope of Metric: The scope includes:

FAA's annual financial statements, related footnotes, and required supplementary information;

An independent, biennial assessment and audit of the FAA's personnel management system, policies and practices by OPM; and

Indicators of employees' views of the Talent Management and Leadership performance of FAA's managers.

Method of Setting Target: The target was selected relative to the most recent opinion and assessment of FAA's financial and human resources management systems. The FY 2010 EVS data provides a positive reflection of employee's views of the performance of FAA's managers in talent management and leadership and increasing those scores by 8 percent sets a stretch goal.

Why the FAA Chooses this Metric

The FAA chooses this metric to show its success in financial and human resources management as indicated by assessments from outside sources. OPM manages the EVS process as part of the President's efforts to improve workforce engagement. Research by the Corporate Leadership Council and other organizations has shown that employee development and training has lasting positive impacts on employee engagement as does effective leadership. OPM has identified the Human Capital Assessment and Accountability Framework (HCAAF) Leadership and Talent Management indices as the EVS-based measures of those areas.

Public Benefit

The public benefits by being reasonably assured the agency is being operated in a transparent and fiscally responsible manner and that our human resources management system is legally compliant with merit systems principles, adheres to veterans' preference rules and maintains an internal system of accountability. The public also benefits by knowing that our human resource practices, programs and policies position us to compete for the best and brightest talent to ensure a safe, efficient, and responsive air transportation system for the flying public.

Partners

ABA coordinates the efforts of all FAA organizations in following accounting policy properly, and for entering accurate source data into the accounting system. While AHR has fiduciary oversight and corporate responsibility for the agency's human resources management system, all FAA organizations and managers and supervisors are accountable for their HR decisions. It is essential that we work collaboratively to ensure sound, merit-based practices are implemented within the agency to achievement satisfactory reviews of our financial and human resource management systems.

External Factors Affecting Performance

External financial data, such as excise tax revenue of the Airport and Airway Trust Fund (AATF), collected and attributed to the AATF by the Department of Treasury (Treasury) can affect FAA performance. FAA analyzes this data to ensure reasonableness; however we rely upon various Treasury bureaus for the accuracy of these amounts which are reported in FAA's financial statements.

Regarding human resources management, external factors that can affect FAA's results include OPM's use of the Central Personnel Data File (CPDF) and not the agency's official personnel system of record, Federal Personnel and Payroll System (FPPS), which is maintained by the Department of Interior. FAA must rely on OPM for the accuracy of information reported in the CPDF.

Factors such as Congressional budget decisions and legislation could affect the levels of funding for training. Decreases in available training could in turn negatively affect employees' perceptions of FAA's support for their development and career opportunities. Also, the same Congressional decisions and along with negative press articles can affect employees' perceptions of leaders' government-wide and within FAA.

Source of the Data

Several sources of data are required to support the achieved success rate of this performance measure.

The data used to evaluate FAA's financial management component of this measure comes from the independent auditors' report, issued at the conclusion of their audit of FAA's annual financial statements. The auditors' report is published annually in FAA's Performance and Accountability Report.

The data used for OPM's compliance review and audit of FAA's human resources management system is

The auditors' report is published annually in FAA's Performance and Accountability Report.

The data used for OPM's compliance review and audit of FAA's human resources management system is collected from official personnel case files and records from approved audit sites (i.e., cross-section of FAA regional, Centers and Headquarters HR offices), interviews with HR staff, OPM's central personnel data file (CPDF), and published agency policies and guidelines. Data collected from these sources are then compiled and analyzed by OPM's evaluators, and findings from their review are documented in an independent report, containing recommended actions as necessary, issued at the conclusion of the audit. OPM's decision to renew, or extend, FAA's personnel interchange agreement is subsequently transmitted in an Executive Memorandum, and serves as the official source of performance data for the metric.

OPM administers the EVS Survey, maintains the database, and provides the official results and reports for the whole government and individual agencies. OPM provides FAA the information needed to calculate its score on this index.

Statistical Issues

The assessments of the financial and human resources management systems must be perfect to contribute 40 percent each toward the total 90 percent success rate. Although the Leadership and Talent Management index percentage are each weighted 10 percent of the total percentage, a combination of these weighted values must total at least 10 percent. If the combined weighted value of the indices exceeds 10 percent, FAA will exceed the 90 percent success rate. Similarly, if the combined value is less than 10 percent, FAA will not meet the 90 percent target.

The baseline of the index scores was established using FY 2010 EVS results and the value of the index scores will likely change as the results of each EVS are reported. The FAA established an increase of 8 percent by FY 2018 in the score of each index to demonstrate its commitment to meeting the President's challenge to improve workforce engagement. While the combined value is essential to achieving the 90 percent success rate, an increase in the value of the index scores year after year will result in exceeding the target.

Completeness

Achievement of this target will be fully documented by the assessments from independent auditors and OPM review, with the results being issued by those organizations. OPM has identified the Human Capital Assessment and Accountability Framework (HCAAF) Leadership and Talent Management indices as the EVS-based measures of those areas. The Leadership Index covers a range of leader roles and performance dimensions and the Talent Management Index covers a comprehensive range of issues related to the effective training and development of employees and the application of knowledge and skills in the workplace. The FAA desires to increase the score of these indices each year to show an 8 percent increase by FY 2018. The results for these indices will be reported in the year-end documentation of this performance measure.

Reliability

OPM's Talent Management and Leadership Indices meet reliability standards for survey scales (coefficient alpha); however, the factors described in the Statistical Issues section could reduce reliability.

PORTFOLIO OF GOALS
FY 2012 Methodology Report
FAA Performance Metrics in DOT Strategic Plan

U.S. Department of Transportation
Federal Aviation Administration

SAFETY
Commercial Air Carrier Fatality Rate

FY 2012 Performance Target

In FY 2012, the commercial air carrier fatality rate will not exceed 7.6 fatalities per 100 million people on board.

FAA Outcome and Performance Metric in DOT Strategic Plan

Outcome: Reduction in transportation-related fatalities and injuries.

Performance Measure: Reduce commercial aviation air carrier fatalities to no more than 7.4 per million persons on board in FY 2013. *This is a DOT Priority Goal*

Lead Organization: Aviation Safety

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
Target	8.7	8.4	8.1	7.9	7.6
Actual	0.4	6.7	0.3	0.0[1]	TBD

[1] Preliminary estimate. Final data will be available in March 2013.

Definition of Metric

Metric Unit: Number of fatalities per 100 million persons on board.

Computation: Number of fatalities, including ramp accidents and other fatalities as a result of the accident, divided by number of passengers and crew on board flights.

Formula:

$$\frac{\text{Number of commercial air carrier fatalities}}{(\text{Number of persons on board}/100{,}000{,}000)}$$

Scope of Metric: This metric includes both scheduled and nonscheduled flights of U.S. passenger and cargo air carriers (14 CFR Part 121) and scheduled passenger flights of commuter operators (14 CFR Part 135). It excludes on-demand (i.e., air taxi) service and general aviation. Accidents involving passengers, crew, ground personnel, and the uninvolved public are all included.

Method of Setting Target: The annual targets were calculated to reflect a linear reduction based on the long-term strategic target to reduce fatalities per 100 million persons on board to 4.4% by the year 2025. The baseline, 8.88% was established during the 1997-2006 timeframe.

Why DOT and FAA choose this Metric

We chose this metric because it is easy to understand and measures the individual risk to the flying public. The metric will help us to move toward a low sustainable rate by maintaining our focus on recently identified risks.

Public Benefit

As fatal air carrier accidents have declined in terms of average fatalities per accident, this metric will sharpen FAA's focus on helping air travel become even safer.

Partners

Partners include: Bureau of Transportation Statistics (BTS); National Transportation Safety Board (NTSB); FAA's Office of Policy, International Affairs and Environment (APL).

External Factors Affecting Performance

Approximately 80 percent of fatal accidents are directly related to some form or combination of human factors. These run the gamut of external organizational influences, inadequate supervision, personnel factors (such as self-imposed stress), to individual acts, such as skill-based errors, misperception errors, judgment and decision-making errors, etc. While an accident's causation can be thoroughly investigated and understood by FAA, as a practical matter, the agency's ability to influence basic decisions by every pilot, every day, and in every circumstance to prevent the accidents becomes much more difficult.

Source of the Data

The data on commercial fatalities come from NTSB's Aviation Accident Database. All but a small share of the data for persons on board comes from the air carriers, who submit information for all passengers on board to the Office of Airline Information (OAI) within BTS. In addition, FAA estimates crew on board based on the distribution of aircraft departures by make and model, plus an average of 3.5 persons on board per Part 121 cargo flight.

Statistical Issues

Both accidents and passengers on board are censuses, having no sampling error. Crew on board is an estimate with a small range of variation for any given make and model of aircraft. Departure data and enplanements for Part 121 are from the BTS. The crew estimate is based on fleet makeup and crew requirements per number of seats. For the current fleet, the number of crew is equal to about seven percent of all Part 121 enplanements. The average number of cargo crew on board is 3.5 per departure, based on data from subscription services such as Air Claims, a proprietary database used by insurers to obtain information such as fleet mix, accidents and claims. Cargo crews typically include two flight crew members, and occasionally another pilot or company rep, or two deadheading passengers. Part 135 data also comes from BTS and Air Claims databases, but is not as complete. AEP calls the operators where BTS data have gaps. Based on previous accident and incident reports, the average Part 135 enplanement is five per departure. Crew estimates for Part 135 are based on previous accident and incident data. Any error that might be introduced by estimating crew will be very small and will be overwhelmed by the passenger census. Also, note that the fatality rate is small and could significantly fluctuate from year to year due to a single accident.

Completeness

The FAA does comparison checking of the departure data collected by BTS. This data is needed for crew estimates. However, FAA has no independent data sources against which to validate the numbers submitted to BTS. FAA compares its list of carriers to the Department of Transportation list to validate completeness and places the carriers in the appropriate category (i.e., Part 121 or Part 135). The number of actual persons on board for any given period is considered preliminary for up to 18 months after the close of the reporting period. This is due to amended reports subsequently filed by the air carriers. Preliminary estimates are based on projections of the growth in departures developed by APL. However, changes to the number of persons on board should rarely affect the annual fatality rate. NTSB and FAA's Office of Accident Investigation and Prevention meet regularly to validate the accident and fatality count.

To overcome reporting delays of 60 to 90 days, FAA must rely on historical data, partial internal data sources, and Official Airline Guide (OAG) scheduling information to project at least part of the fiscal year activity data. The FAA uses OAG data until official BTS data are available. The final result for the air carrier fatality rate is not considered reliable until BTS provides preliminary numbers. Due to reporting procedures in place, it is unlikely that calculation of future fiscal year departure data will be markedly improved. This lack of complete historical data on a monthly basis and independent sources of verification increases the risk of error in the activity data.

NTSB and the Office of Accident Investigation and Prevention meet regularly to validate information on the number of fatalities. Accident data are considered preliminary. NTSB usually completes investigations and issues reports on accidents that occur during any fiscal year by the end of the next fiscal year. Results are considered final when all those accidents have been reported in the NTSB press release published by March.

FY 2012 results will therefore be final after the 2014 press release. In general, however, fatal and serious injury accident numbers are not likely to change significantly between the end of the fiscal year and the date they are finalized.

Reliability

Results are considered preliminary based on projected activity data. The FAA uses performance data extensively for program management, personnel evaluation, and accountability. Most accident investigations are a joint undertaking. NTSB has the statutory responsibility to determine probable cause, while FAA has separate statutory authority to investigate accidents and incidents in order to ensure that FAA meets its broader responsibilities. The FAA's own accident investigators and other FAA employees participate in all accident investigations led by NTSB investigators.

PORTFOLIO OF GOALS
FY 2012 Methodology Report
FAA Performance Metrics in DOT Strategic Plan

U.S. Department of Transportation
Federal Aviation Administration

SAFETY
General Aviation Fatal Accident Rate

FY 2012 Performance Target

Limit the general aviation fatal accident rate to no more than 1.07 fatal accidents per 100,000 flight hours.

FAA Outcome and Performance Metric in DOT Strategic Plan

Outcome: Reduction in transportation-related fatalities and injuries.

Performance Metric: Reduce the general aviation fatal accident rate per 100,000 flight hours to no more than 1.06 in FY 2013. *This is a DOT Priority Goal.*

Lead Organization: Aviation Safety

	FY 2008	FY 2009[1]	FY 2010	FY 2011	FY 2012
Target	N/A	1.11	1.10	1.08	1.07
Actual	N/A	1.17	1.10	1.12[2]	TBD

[1] This was a new metric for FY09, replacing the numerical general aviation fatal accident reduction metric. No data are available for prior years.
[2] Preliminary estimate. Final data will be available in March 2013.

Definition of Metric

Metric Unit: Number of fatal accidents per 100,000 flight hours.

Computation: The number of general aviation fatal accidents divided by the number of flight hours.

Formula:

$$\frac{\text{Number of general aviation fatal accidents}}{(\text{Number of general aviation flight hours} / 100{,}000)}$$

Scope of Metric: This metric includes on-demand (non-scheduled FAR Part 135) and general aviation flights. General aviation comprises a diverse range of aviation activities, from single-seat homebuilt aircraft, helicopters, balloons, single and multiple engine land and seaplanes, to highly sophisticated, extended range turbojets.

Method of Setting Target: The three safest years in general aviation history (Jun 2006-May 2008) were used as the baseline. Government and industry consensus was to target a 10 percent reduction in 10 years from this baseline. Each year's annual target is a linear reduction to achieve the overall 10 percent reduction in 10 years. Therefore, we do not have targets beyond 2018.

Why the FAA Chooses this Metric

The success of FAA and industry collaborative safety initiatives continues to drive the general aviation fatal accident rate lower. This metric was adopted in FY 2009 to replace the existing general aviation fatal accident metric. The FAA and the general aviation community have determined that a general aviation fatal accident rate rather than the number of fatal accidents is a better performance metric because the rate reflects fleet activity levels and their relationship to the number of fatal accidents. The Fatal Accident Rate is a true rate-based metric and tracks changes in the fatal accident rate for a fixed volume of flight hours (per 100,000).

Public Benefit

By tracking the rate of fatal accidents per flight hours, FAA can more accurately pinpoint safety concerns or trends indicating potential safety concerns.

Partners

National Transportation Safety Board's (NTSB), FAA's Office Aviation Policy and Plans (APO), and the FAA and Industry General Aviation Joint Steering Committee (GAJSC), which includes AOPA, GAMA, NBAA, EAA, academia, etc.

External Factors Affecting Performance

Approximately 80 percent of general aviation fatal accidents are directly related to some form or combination of human factors. These run the gamut of external organizational influences, inadequate supervision, personnel factors (such as self-imposed stress), to individual acts, such as, skill-based errors, misperception errors, judgment and decision-making errors, etc. These human factor influences are occurring in a broad spectrum of general aviation activities from more highly regulated on-demand air taxi service in sophisticated aircraft, to more loosely regulated recreational flying in homebuilt aircraft. While accident causation can be thoroughly investigated and understood by FAA, as a practical matter, the FAA's ability to influence basic decisions by every pilot, every day, and in every circumstance to prevent the accidents becomes much more difficult.

Source of the Data

The data for general aviation fatal accidents comes from the National Transportation Safety Board's (NTSB) Aviation Accident Database. Aviation accident investigators, under the auspices of the NTSB, develop the data.

Annual flight hours are derived from the FAA's annual *General Aviation and Part 135 Activity Survey*. Current year estimates are provided by FAA's Forecast and Performance Analysis Division, APO-100.

Statistical Issues

The NTSB determines the actual number of general aviation fatal accidents. Since this is a simple count of accidents, there are no statistical issues relevant to this data.

The survey data for activity are highly accurate with a percent-standard error of less than 1 percent. The general aviation community and the General Aviation Joint Steering Committee (GAJSC) of the Safer Skies initiative recommended development of a data collection program that will yield more accurate and relevant data on general aviation demographics and utilization. Improved survey and data collection methodologies have been developed.

As a result of these efforts, FAA, working with the General Aviation Manufacturers Association, the NTSB, and other aviation industry associations, has made many improvements to the survey. First, the sample size has significantly increased. Second, a reporting form has been created to make it much easier for organizations with large fleets to report. Third, the agency worked with the Aircraft Registry to improve the accuracy of contact information. As a result, an improved survey was completed in FY 2004. This survey created, for the first time, a statistically valid report of activity on which the general aviation community could agree. Each year since 2004, significant improvements have been made which, in turn, substantially improved the accuracy of the data.

The GAJSC General Aviation Data Improvement Team has worked closely with the general aviation community and industry to develop this performance metric and target. There is unanimous support and consensus for the metric and target.

Completeness

The number of general aviation fatal accidents, even when reported as preliminary, is very accurate. When final reports are issued, the number of fatal accidents does not change significantly. NTSB classifications are considered final when the Board issues their annual press release. Accidents during a fiscal year are addressed in the NTSB press release issued at the end of the following year.

GA Survey calendar hours are finalized by October 31 of the following year. Hence, the fatal accident rate for FY 2012 will not be considered final/complete until October 2013.

Reliability

The FAA uses performance data extensively for program management, and personnel evaluation and accountability. Most accident investigations are a joint undertaking between FAA and NTSB. NTSB has the statutory responsibility, but, in fact, most of the accident investigations related to general aviation are conducted by FAA Aviation Safety Inspectors without NTSB direct involvement. The FAA's own accident investigators and other FAA employees participate in all accident investigations led by NTSB investigators.

As mentioned above, the large sample for FAA's activity survey, along with the ease of data collection, produce highly accurate flight hour data. The low standard error which results ensures the reliability of these data.

PORTFOLIO OF GOALS
FY 2012 Methodology Report
FAA Performance Metrics in DOT Strategic Plan

U.S. Department of Transportation
Federal Aviation Administration

SAFETY
Serious Runway Incursion Rate

FY 2012 Performance Target

Maintain the rate of serious runway incursions (Category A & B) to no more than 0.395 per million operations.

FAA Outcome and Performance Metric in DOT Strategic Plan

Outcome : Reduction in transportation-related fatalities and injuries.

Performance Metric: Reduce category A&B runway incursions in all airports to a rate of no more than 0.395 per million operations in FY 2013.

Lead Organization: Air Traffic Organization – Office of Safety

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012[1]
Target	0.509	0.472	0.450	0.450	0.395
Actual	0.427[1]	0.227	0.117	0.138	TBD

[1] Final result revised in FY 2011 from original actual of 0.427, reflecting slight change jn final number of operations.

Definition of Metric

Metric Unit: Rate of Category A & B (most serious) runway incursions per million operations.

Computation: The total number of Category A and B runway incursions is divided by the sum of the number operations divided by 1 million.

Formula:

$$\frac{\text{Number of A \& B Incursions}}{(\text{Operations Count}/1{,}000{,}000)}$$

Scope of Metric: A runway incursion is any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and takeoff of aircraft. They are grouped in three general categories: air traffic, pilot, or vehicle/pedestrian events Runway incursions are reported and tracked at airports that have an operational air traffic control tower. Operations are defined as total takeoffs and landings.

The FAA tracks four categories of runway incursions - A, B, C, D - but includes only those with the highest risk of collision, Category A and B incursions, in the metric.

- Category A: Separation decreases to the point that participants take extreme action to narrowly avoid a collision.
- Category B: Separation decreases, and there is a significant potential for a collision.
- Category C: Separation decreases, but there is ample time and distance to avoid a collision.
- Category D: There is little or no chance of collision, but the definition of a runway incursion is met.

In FY 2002, FAA changed the focus of measurement for runway incursions from all incursions to those incursions with measurable risk of collision, Categories A and B.

Since Category C and D incursions were not likely to lead to an accident or a significant risk of an accident, their inclusion in the previous total tended to mask true safety risk. The new metric reflects the focus of FAA's runway safety effort to reduce the rate of the incursions with demonstrable risk.

Method of Setting Target: This target was set based on past history and long term trends of the rate of serious runway incursion events.

Why the FAA Chooses this Metric

Runway incursions create dangerous situations that can lead to serious accidents. Reducing the number of runway incursions lessens the probability of accidents that potentially involve fatalities, injuries, and significant property damage.

Public Benefit

Reduced probability that the public will be injured or killed in an accident resulting from a runway incursion.

Partners

The FAA Co-Chairs the Runway Safety Council with the Aircraft Owners and Pilots Association (AOPA). Other Council members include the Airline Transport Association, the Air Line Pilots Association, NATCA, National Association of Flight Instructors, National Business Aviation Association, Regional Airline Association, National Air Traffic Controllers Association, Airport Councils International-North America, and the American Association of Airport Executives. The program has internal FAA support from AVS, ARP, and ATO.

External Factors Affecting Performance

Runway incursions are the result of an air traffic controller, pilot, or vehicle/pedestrian event. The FAA has direct influence on air traffic controller performance, but indirect influence on pilots and airport personnel.

Source of the Data

Air traffic controllers and pilots are the primary source of runway incursion reports. The data are recorded in the FAA Air Traffic Quality Assurance (ATQA) database, which has replaced the FAA National Incident Monitoring System. Preliminary incident reports are evaluated when received and evaluation can take up to 90 days

Statistical Issues

None

Completeness

The data are typically not finalized for 90 days following the close of the fiscal year. Surface event reports are reviewed on a daily basis to determine if the incident meets the definition of a runway incursion. Runway incursions are a subset of the incident data collected and the completeness of the data is based on the reporting requirements and completeness for each of the incident types.

If the operations data are not up to date, these calculations must be revised. The rate may also need to be recalculated if runway incursions are reported late. Historical volume data have been changed over the last three years, resulting in adjustments to current baselines.

Reliability

FAA uses performance data extensively for program management, personnel evaluation, and accountability in prioritizing its facility evaluations and audits. The data are also used to track daily progress on performance goals. Annual runway incursion incident data are used to provide a statistical basis for research and analysis and outreach initiatives. FAA verifies and validates the accuracy of the data through reviews or preliminary and final reports. Reconciliation of the databases is conducted monthly and anomalies are explored and resolved. In cases where major problems are identified, a request to re-submit is issued. The FAA conducts annual reviews of reported data and compares them with data reported from previous years.

PORTFOLIO OF GOALS

FY 2012 Methodology Report
FAA Performance Metrics in DOT Strategic Plan

U.S. Department of Transportation
Federal Aviation Administration

STATE OF GOOD REPAIR
Runway Pavement Condition

FY 2012 Performance Target

At least 93% of airport runways are in excellent, good or fair condition.

FAA Outcome and Performance Metric in DOT Strategic Plan

Outcome : Maintain the percentage of airport runways in excellent, good, or fair condition.

Performance Metric: Maintain runway pavement in excellent, good, or fair condition for 93 percent of the paved runways in the National Plan of Integrated Airport Systems through 2016.

Lead FAA Organization: Airports

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
Target	93.0%	93.0%	93.0%	93.0%	93.0%
Actual	96.9%	97.0%	97.2%	97.4%	TBD

Definition of Metric

Metric Unit: This metric tracks, on an annual basis, the number of runways at public use airports included in the federal airport system that meet FAA's standard for safe operation of aircraft with runway pavement considered to be in excellent, good, or fair condition.

Computation: This information is collected through visual inspection of runway pavement, in accordance with Advisory Circular 150/5320-17. The number of paved runways in the National Plan of Integrated Airport Systems (NPIAS) with surface ratings in each of the five conditions (excellent, good, fair, poor, and failed) is totaled. Paved runway ratings are numbered by condition: excellent = 5; good = 4; fair=3; poor=2; failed=1. Landing surfaces that are not paved, including water, dirt, turf, gravel, and permafrost, are not included. The percentage of runways rated excellent, good, and fair is calculated based on the total number of paved runways at NPIAS airports.

Formula:

$$\frac{\text{X condition 5 runways} + \text{Y condition 4 runways} + \text{Z condition 3 runways}}{\text{total NPIAS paved runways}}$$

Scope of Metric: The metric covers all paved runways at federally funded NPIAS airports.

Method of Setting Target: Maintaining runway pavement conditions requires careful coordination, often years in advance, of a runway rehabilitation project. Projects must be timed precisely, regardless of whether they involve the phased reconstruction of a single-runway airport or the sequential resurfacing of multiple runways over a period of several years. Some of the nation's largest airports resurface one runway every year on a revolving basis. As a result, FAA is able at times to exceed the goal. However, this does not necessarily represent a sustainable trend. For major reconstruction, runways must typically be taken out of service for a full construction season or longer. It can be particularly challenging to rehabilitate one runway while keeping intersecting runways operational. FAA works with airports to ensure that the system

never has too many runways out of service at any given time.

Why DOT and FAA Choose this Metric

This metric was chosen because if runway pavement is neglected, severe deterioration can cause damage to airframes, engines, and landing gear, unnecessarily compromising safety, and leading to higher rehabilitation costs.

Public Benefit

Periodic maintenance of runways, particularly resurfacing, has proven a cost effective way to delay the need for major runway rehabilitation. The FAA funds initial infrastructure development at all NPIAS airports; however, funding for maintenance is limited to those airports that generally do not generate sufficient revenue for periodic repairs—usually smaller airports. Deferred or delayed maintenance creates an increased risk of damage to aircraft and is a safety concern for the travelling public, increasing both the scope and cost of eventual rehabilitation or reconstruction.

Partners

FAA's Regional Airports Divisions and Airports District Offices partner with individual airports to identify poor or failed pavement. FAA's airport inspectors along with inspectors from state aeronautical agencies conduct visual inspections of the runways. Four other offices support this effort: the Air Traffic Organization, which assesses the impact of the runway's condition on navigational aids; the Flight Procedures Office and Flight Standards Service, which assess its impact on pilots; and the William J. Hughes Technical Center, which assists with pavement research.

External Factors Affecting Performance

The airport sponsor is responsible for maintaining runway pavement. Economic factors may determine when the airport sponsor is able to fund pavement rehabilitation. In addition, if federal and state funding for airport improvements is reduced, the timing of rehabilitation projects may be slowed or deferred.

Source of the Data

Results of the inspections are entered into FAA's National Airspace System Resource.

Statistical Issues

None

Completeness

The inspection and reporting of conditions are conducted in accordance with existing FAA guidance. The data are publicly available and therefore can be examined and evaluated by any federal auditor.

Reliability

N/A

PORTFOLIO OF GOALS
FY 2012 Methodology Report
FAA Performance Metrics in DOT Strategic Plan

U.S. Department of Transportation
Federal Aviation Administration

ECONOMIC COMPETITIVENESS
Average Daily Airport Capacity (Core Airports)

FY 2012 Performance Target

Maintain an average daily airport capacity for Core Airports of 86,835 arrivals and departures per day.

FAA Outcome and Performance Metric in DOT Strategic Plan

Outcome: Maximum economic returns on transportation policies and investments.

Performance Metric: Maintain an average daily airport capacity for Core Airports of 86,835 arrivals and departures through FY 2016.

Lead Organization: Air Traffic Organization

	FY 2008	FY 2009	FY 2010	FY 2011[1]	FY 2012
Target	N/A	N/A	N/A	86,606	86,835
Actual	N/A	N/A	N/A	87,338	TBD

[1] This metric was revised in FY 2011 to include a new set of airports, replacing the original 35 Operational Evolution Partnership airports. New targets were set.

Definition of Metric

Metric Unit: Average of daily arrival and departure rates.

Computation: Average Daily Airport Capacity is the sum of the daily hourly-called arrival and departure rates at the relevant airports per month, divided by the number of days in the month. The annual capacity level is the weighted sum of the monthly capacity levels.

Formula:

$$\frac{\text{Daily Hourly Called Arrival \& Departure Rates}}{\text{Number of Days in the Month}}$$

Scope of Metric: Only the Core Airports are included in this metric. Each airport facility determines the number of arrivals and departures it can handle for each hour of each day, depending on conditions, including weather. These numbers are the called arrival and departure rates of the airport for that hour. Data are summed for daily, monthly, and annual totals.

Method of Setting Target: Annual targets are set using historical trend data for the previous three years, information on upcoming construction impacts, and inputs from individual Air Traffic Control facilities.

Why DOT and FAA Choose this Metric

Growth in air travel has generally been accomplished by increasing the number of flights. Measuring the growth of airport capacity indicates the limit at which increased service can be accommodated without affecting delay.

Public Benefit

The public benefits from increased capacity by experiencing a decrease in delays and improved on-time performance.

Partners

ATO (AJR, AJE, AJT, AJW, AJS); AEP; ARC; ARP

External Factors Affecting Performance

Called rates at airports, which are adjusted in real time throughout the day, are primarily impacted by weather, construction/maintenance impacts, procedural changes, and equipment outages.

Source of the Data

The Aviation System Performance Metrics (ASPM) database, maintained by the FAA's Office of Aviation Policy and Plans, provides the data for this metric. The individual air traffic facilities for the Core Airports provide arrival and departure rates. APO staff feed this information into the ASPM database.

Statistical Issues

None.

Completeness

Fiscal year data are finalized approximately 90 days after the close of the fiscal year.

Reliability

The reliability of ASPM is verified on a daily basis by the execution of a number of audit checks, comparison to other published data metrics, and through the use of ASPM by over 1,500 registered users.

PORTFOLIO OF GOALS
FY 2012 Methodology Report
FAA Performance Metrics
in DOT Strategic Plan

U.S. Department of Transportation
Federal Aviation Administration

ECONOMIC COMPETITIVENESS
Adjusted Operational Availability

FY 2012 Performance Target

Sustain adjusted operational availability at 99.70% for the reportable facilities that support the Core Airports.

Outcome and Performance Metric in DOT Strategic Plan

Outcome: Maximum economic returns on transportation policies and investments.

Performance Metric: Maintain operational availability of the National Airspace System (NAS) at 99.7 percent through 2016.

Lead Organization: Air Traffic Organization

	FY 2008	FY 2009	FY 2010	FY 2011[1]	FY 2012
Target	N/A	N/A	N/A	99.70	99.70
Actual	N/A	N/A	N/A	99.72	TBD

[1] This metric was revised in FY 2011 to include a new set of airports, replacing the original 35 Operational Evolution Partnership airports. Annual targets were not changed.

Definition of Metric

Metric Unit: Ratio of total available hours minus outage time to total available hours.

Computation: Adjusted Operational Availability is calculated by dividing the maximum facility/service hours minus all outage time except for improvements (cause code 62 outages) by the total maximum facility/service hours, and multiplying by 100 to express the ratio as a percentage.

Formula:

$$\frac{\text{Total Available Hours} - (\text{Total Outage Time} - \text{Code 62 Outage Time})}{\text{Total Available Hours}} \times 100$$

Scope of Metric: The National Airspace Performance Reporting System (NAPRS) facilities necessary to maintain the provision of service in the NAS overall have been determined and are monitored. For this metric, those NAPRS reportable facilities necessary for the provision of service at the Core Airports have been separately measured. Time out of service is adjusted to exclude hours when equipment is unavailable due to scheduled improvement (cause code 62) down time.

Method of Setting Target: The target was initially set at 99.5 percent and subsequently increased to 99.7 percent. Historical analysis and trending levels were used to set and increase the target.

Why DOT and FAA Choose this Metric

The availability of the equipment necessary to provide service directly affects the performance of the NAS. Loss of radar or communications equipment will affect the speed and number of aircraft that can be handled where that loss occurs. The ability of the NAS to continually provide guidance is crucial, and affects both safety and capacity. The adoption of this metric has the additional advantage of linking three capacity

measures. NAS On-Time Arrivals are affected by the airport and en-route capacity, which are directly impacted by the availability of the equipment and facilities supporting that capacity.

Public Benefit

The public realizes an indirect benefit from the Adjusted Operational Availability Metric. Airline on-time performance is affected by the airport and en-route capacity, which are directly impacted by the availability of the equipment and facilities supporting that capacity. The safety of air travelers is dependent on navigational and communications equipment, and redundant back-up systems.

Partners

The Technical Operations Service Unit within the FAA's Air Traffic Organization works with equipment vendors, En Route and Terminal Service Units to provide service to customers.

External Factors Affecting Performance

Several external factors may affect Adjusted Operational Availability. Funding levels may limit availability of maintenance personnel. Higher incidences of equipment failure, usually due to weather or natural disaster, may negatively affect the year-end average.

Source of the Data

The National Airspace System Performance Analysis System (NASPAS). NASPAS was developed to analyze outages of the Air Traffic Control Facilities in the NAS maintained by the FAA. NASPAS receives monthly updates of outage data from the National Outage Database (NODB). The Maintenance Management System (MMS) contains individual equipment outage data as recorded by the system specialist.

Statistical Issues

None.

Completeness

The FAA's Quality Assurance and Performance Team, under ATO-W, conducts a monthly review of all Log Interrupt Reports (LIRs) that are entered into the MMS to ensure the data, which resides in the NODB, are as complete and accurate as possible.

Reliability

The National Airspace System Performance Analysis System is the official source of equipment and service performance data for the Federal Aviation Administration.

PORTFOLIO OF GOALS
FY 2012 Methodology Report
FAA Performance Metrics
in DOT Strategic Plan

U.S. Department of Transportation
Federal Aviation Administration

ECONOMIC COMPETITIVENESS
NAS On-Time Arrivals

FY 2012 Performance Target

Achieve a NAS On-Time Arrival rate of 88.00 percent at the Core Airports.

FAA Outcome and Performance Metric in DOT Strategic Plan

Outcome: A competitive air transportation system responsive to consumer needs.

Performance Metric: Maintain a NAS on-time arrival rate of 88.00 percent at Core Airports through 2016.

Lead Organization: Air Traffic Organization

	FY 2008	FY 2009	FY 2010	FY 2011[1]	FY 2012
Target	N/A	N/A	N/A	88.00%	88.00%
Actual	N/A	N/A	N/A	90.41	TBD

[1] This metric was revised in FY 2011 to include a new set of airports, replacing the original 35 Operational Evolution Partnership airports. Annual targets were not changed.

Definition of Metric

Metric Unit: Percentage of flights arriving no more than 15 minutes late.

Computation: NAS On-Time Arrival is the percentage of all flights arriving at the Core Airports equal to or less than 15 minutes late, based on the carrier flight plan filed with the FAA, and excluding minutes of delay attributed by air carriers to weather, carrier action, security delay, and prorated minutes for late arriving flights at the departure airport. The number of flights arriving on or before 15 minutes of flight plan arrival time is divided by the total number of completed flights, and the result is multiplied by 100 to convert it to a percentage.

Formula:

$$\frac{\text{NAS On - Time Flights}}{\text{Total Flights}} \times 100$$

Scope of Metric: A flight is considered on time if it arrives no later than 15 minutes after its published, scheduled arrival time. This definition is used in both the DOT Airline Service Quality Performance (ASQP), and Aviation System Performance Metrics (ASPM) reporting systems. Air carriers, however, also file up-to-date flight plans for their services with the FAA that may differ from their published flight schedules. This metric measures on-time performance against the carriers' filed flight plan, rather than what may be a dated published schedule.

The time of arrival of completed passenger flights to and from the Core Airports is compared to their flight plan scheduled time of arrival. For delayed flights, delay minutes attributable to extreme weather, carrier caused delay, security delay, and a prorated share of delay minutes due to a late arriving flight at the departure airport are subtracted from the total minutes of delay. If the flight is still late, it is counted

as a delayed flight attributed to the National Aviation System (NAS) and the FAA.

Method of Setting Target: The target is set based on three years of historical trending data.

Why DOT and FAA Choose this Metric

On-Time performance is a measure of the ability of the FAA to deliver services. A major weakness of using air carrier scheduled on-time performance as a metric is that it contains flight delays caused by incidents outside the FAA's control. However, the air carriers have supplied the causation of flight delay, by flight, since June 2003 under revised Part 234 instructions. Removal of delays not attributable to the FAA provides a more accurate and equitable method of measuring the FAA's performance.

Public Benefit

This metric helps the flying public reach their intended destinations on time.

Partners

ATO (AJE, AJT, AJR, AJW, AJS); ARC; ARP; APL; ATA; NBAA; airlines

External Factors Affecting Performance

Weather, airline scheduling practices, runway construction/maintenance, ramp/airport congestion.

Source of the Data

The ASPM database, maintained by the FAA's Office of Aviation Policy and Plans, in conjunction with DOT's ASQP causation database, provides the data for this metric. By agreement with DOT, certain major carriers file ASQP flight data for all flights to and from most large and medium hubs. Flight records contained in the Traffic Flow Management System (TFMS) and flight movement times provided by Aeronautical Radio, Inc. (ARINC) supplement the flight data.

Statistical Issues

Data are not reported for all carriers, only the 20 carriers reporting monthly into the ASQP reporting system.

Completeness

Fiscal year data are finalized approximately 90 days after the close of the fiscal year.

Reliability

The reliability of ASPM is verified on a daily basis by the execution of a number of audit checks, comparison to other published data metrics, and through the use of ASPM by over 1500 registered users. ASQP data is filed monthly with DOT under 14 CFR Part 234, Airline Service Quality Performance Reports, which separately requires reporting by major air carriers on flights to and from all large hubs.

PORTFOLIO OF GOALS
FY 2012 Methodology Report
FAA Performance Metrics in DOT Strategic Plan

U.S. Department of Transportation
Federal Aviation Administration

ENVIRONMENTAL SUSTAINABILITY
NAS Energy Efficiency

FY 2012 Performance Target

Improve aviation fuel efficiency by 14 percent, as measured by the calendar year 2010 fuel burned per revenue mile flown, relative to the calendar year 2000 baseline.

FAA Outcome and Performance Metric in DOT Strategic Plan

Outcome : Reduction in transportation-related carbon emissions, improved energy efficiency, and reduction in use of oil in the transportation sector.

Performance Metric: Improve National Airspace System (NAS) energy efficiency (fuel burned per distance flown) by at least 2 percent per year from 4.24 teragrams per billions of kilometers (Tg/Bkm) in 2010 to 3.73 Tg/Bkm in 2016.

Lead Organization: Policy, International Affairs & Environment

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
Target	-8%	-9%	-10%	-12%	-14%
Actual	-13.52%	-14.03%	-15.25%	-14.50%	TBD

Definition of Metric

Metric Unit: Fuel burned per mile flown.

Computation: Measuring and tracking fuel efficiency from commercial aircraft operations allows FAA to monitor improvements in aircraft/engine technology and operational procedures, as well as enhancements in the airspace transportation system. The FAA measures performance against this target using the Aviation Environmental Design Tool (AEDT). AEDT is a FAA-developed computer model that estimates aircraft fuel burn and emissions for variable year emissions inventories and for operational, policy, and technology-related scenarios. For this target, AEDT is used to generate annual fuel burn and total distance flown data for all U.S. commercial operations.

Formula:

$$\frac{\text{Fuel Burn (Tg)}}{\text{Distance (billions of kilometers)}}$$

(Fuel Burn values in Teragrams, Tg, where 1 Tg = 10^{12} grams)

Scope of Metric: This metric focuses on all U.S. commercial operations.

Method of Setting Target: Fuel efficiency target was selected based upon knowledge of the factors that most accurately characterize commercial aircraft fleet fuel efficiency. The data that underlie this target can be assessed in terms of aircraft and engine technology, fleet turnover, and air traffic management procedures that influence routes and schedule.

Why DOT and FAA Choose this Metric

Measuring and tracking fuel efficiency from aircraft operations allows FAA to monitor improvements in aircraft/engine technology and operational procedures, and enhancements in the airspace transportation system. This information provides an assessment of their influence on reducing aviation's emissions contribution.

Public Benefit

Today's aircraft are up to 70 percent more efficient than early commercial jet aircraft. However there is growing concern over aviation's impact on the environment and public health. Aviation is currently viewed as a relatively small contributor to those emissions that have the potential to influence air quality and global climate. Carbon dioxide (CO_2) emissions are a primary greenhouse gas and are directly related to the fuel burned during the aircraft's operation. As air traffic grows, this contribution will increase without improvements in technology, more efficient air traffic operations, and renewable fuels.

This metric supports the development of these improvements to reduce aviation's impact on the environment and thereby improve public health and welfare. In addition, more fuel efficient aircraft should contribute to improving the financial well-being of commercial airlines and a growing economy.

Partners

The National Aeronautics and Space Administration (NASA) works with FAA to conduct research and development , identifying engine and airframe technologies that offer potential for reducing fuel burn and emissions. The Aerospace Industries Association works with FAA and NASA to commercialize technologies from the research phase and develop operational procedures to address environmental impacts. The Air Transport Association works with FAA to identify fleet and air traffic procedural changes that improve fuel efficiency.

External Factors Affecting Performance

NAS Energy Efficiency is heavily dependent on commercial airline operating procedures and day-to-day operational conditions. This includes operating fleet and route assignments, air traffic conditions, weather, airport operating status, congestion in the system, and any disruptions that introduce delay in scheduled flights. For example, a major sustained disruption or enhancement in air traffic and/or a significant shift in commercial operations amongst airlines, including changes in fleet composition and missions could have a profound impact upon achieving the performance target.

Source of the Data

The AEDT uses radar-based data from the Enhanced Traffic Management System (ETMS) and Official Airline Guide (OAG) schedule information to generate annual inventories of fuel burn and total distance flown data for all U.S. commercial operations.

Statistical Issues

Potential seasonal variability and variability from year-to-year can be expected when analyzing air traffic data and commercial operations.

The extent to which enhancements are incorporated to improve model accuracy, for example via more robust aerodynamic performance modeling algorithms and database of aircraft/engine fuel burn information, will impact the overall results and thus the performance target. This could create some statistical variability from year-to-year if not properly taken into account. In cases where such enhancements have the potential to create a significant shift in baseline, annual inventories may need to be re-processed and/or adjusted to ensure consistency and accuracy of results.

The extent to which aircraft fleet improvements cannot be sufficiently modeled because of a lack of manufacturer proprietary data may also influence the performance target results. In this case, attempts will be made to characterize such aircraft with the best publicly available information, recognizing that newer aircraft types in the fleet will likely exist in significantly lesser numbers, thus minimizing the influence upon the results.

Completeness

Data used to measure performance against the target are assessed for quality control purposes. Input data for the AEDT model are validated before proceeding with model runs. Radar data from the ETMS are assessed to remove any anomalies, check for completeness, and pre-processed for input to the AEDT model. ETMS data are verified against the OAG information in order to avoid any duplication of flights in the annual inventory.

In some cases, ETMS data lack appropriate fields to conduct quality control and in these cases the data are

removed. Data from the AEDT model are verified by comparing output from previous years and analyzing trends to ensure that they are consistent with expectations. In other cases monthly inventories may be analyzed to validate the results. Model output is subsequently post-processed through spreadsheets to perform the calculations for the performance target. Formulae and calculations are checked in order to ensure accuracy.

Full documentation of this target is determined when the annual inventories have been accomplished and the post-processing calculations have been completed, resulting in a percentage reduction in fuel consumption per miles flown (or increase in fuel efficiency) relative to the baseline. The standard for this documentation is set by FAA's Office of Environment and Energy, which is separate from the organization (DOT Volpe National Transportation Systems Center) responsible for input and output associated with the AEDT model runs and annual inventories.

Reliability

The measuring procedure used for this performance target is highly reliable. That is to say that the processing of data through the AEDT model including the performance of algorithms is not subject to random factors that could influence the results. However, as mentioned above, this performance target is potentially influenced by factors outside the control of FAA.

We do not expect increases in fuel burn or decreases in distance traveled or both to degrade the fleet fuel efficiency significantly. Further, we do not expect this to prevent us from meeting the FY 2012 target. However, we do expect that in the future, aircraft and engine technology improvements or air traffic management improvements or both may not be enough to offset traffic growth, congestion and delays. In addition, the current metric for measuring and tracking fuel efficiency may not adequately capture performance to the degree that would allow future decisions on technological and operational considerations. As we continue to review the impact of improvements on air traffic management and changes in operational trends, we will also assess the need for revised performance metrics for future targets.

PORTFOLIO OF GOALS
FY 2012 Methodology Report
FAA Performance Metrics in DOT Strategic Plan

U.S. Department of Transportation
Federal Aviation Administration

ENVIRONMENTAL SUSTAINABILITY
Noise Exposure

FY 2012 Performance Target

Reduce the number of people exposed to significant aircraft noise to less than 386,000 in calendar year 2012.

FAA Outcome and Performance Metric in DOT Strategic Plan

Outcome : Reduction in transportation-related air, water and noise pollution and impacts on ecosystems

Performance Metric: Improve Aviation Noise Exposure (the U.S. population exposed to significant aircraft noise around airports) from 307,420 persons in 2011 by at least 2 percent per year to less than 328,000 persons in 2016.*

Lead Organization: Aviation Policy, Planning, Environment and International

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012[1]
Target	455,000	436,000	419,000	402,000	386,000
Actual	386,662	296,527	323,039	307,420	TBD

[1]For FY 2012, targets and results for this metric were changed from percent of population exposed to the number of persons exposed. The prior years' targets and results have been recalculated from the original percentages.

Definition of Metric

Metric Unit: Number of persons exposed to significant aircraft noise. Significant aircraft noise levels as currently defined as values greater than or equal to 65 decibels dB Day Night Sound Level (DNL). The target is determined by reducing the 2005 population exposed to significant aircraft noise by 1 percent in 2006, and by a 4 percent compounded rate from 2007 to 2018.

Computation: The estimates of the number of people exposed to significant noise are calculated from the Model for Assessing Global Exposure to the Noise of Transport Aircraft (MAGENTA). The computational core of MAGENTA is FAA's Integrated Noise Model (INM), the most widely used computer program for the calculation of aircraft noise around airports. Major assumptions on local traffic utilization come from obtaining INM datasets that were developed for an airport.

The MAGENTA model calculates individual DNL contours for the top 95 US airports using INM. The contours are superimposed on year 2000 Census population densities projected to the current year to calculate the number of people within the DNL 65 dB contour at each airport. For smaller airports, a procedure is used where contour area is calculated from airport operations data using a statistical relationship. The contours areas are then used to calculate people exposed using 2000 Census population densities projected to the current year. The projection is used to account for population growth between 2000 and the current year. The individual airport

* The previous target of 1 percent per year remained in effect from 2005 to 2006. The 4 percent compounded rate of reduction began in 2007.

exposure data are then summed to the national level. Finally, the number of people relocated through the Airport Improvement Program is subtracted from the total number of people exposed.

The U.S. MAGENTA incorporates INM version 7.0. In addition, military operations for the KC-135 were updated based on more accurate information from the Air Force. Older, louder KC-135's are being phased out of service, producing smaller contours at some airports.

Formula:

The number of people exposed to significant aircraft noise is calculated as follows:

$$\sum_{i=1}^{n} POP65_i - \sum_{j=1}^{9} POPREL_j$$

Where, $POP65_i$ is the number of people residing in the DNL 65 dB contour at the i^{th} "Noise Inventory" airport as of the current year projected from the 2000 Census, and n is the number of Noise Inventory airports. A Noise Inventory airport is defined as any airport that reported having at least 365 jet departures for the year being used in the analysis. $POPREL_j$ is the number of people relocated from the DNL 65 dB contour in the j^{th} FAA region since the year 2000.

Scope of Metric:

The metric tracks the residential population exposed to significant aircraft noise around U.S. airports. Significant aircraft noise is defined as aircraft noise above a Day-Night Sound Level (DNL) of 65 decibels. In 1981, FAA issued 14 CFR Part 150, Airport Noise Compatibility Planning, and as part of that regulation, formally adopted Day Night Sound Level. Day Night Sound Level, abbreviated as DNL and symbolized as Ldn, is the 24-hour average sound level, in db, obtained from the accumulation of all events with the addition of 10 decibels to sound levels in the night from 10 PM to 7 AM. The weighting of the nighttime events accounts for the increased interfering effects of noise during the night when ambient levels are lower and people are trying to sleep.

In the promulgation of 14 CFR Part 150, FAA also published a table of land uses that are compatible or incompatible with various levels of airport noise exposure in DNL. This table established that levels below DNL 65 dB are considered compatible for all indicated land uses and related structures without restriction.

Method of Setting Target:

The target was set by analyzing the historical rate of change of noise exposure and taking into account recent events and long term projections of air traffic demand. As air traffic grows over time, noise exposure is likely to move upwards. The target will continue to be re-assessed as we take a more integrated approach to environmental regulation – assessing the relative costs and benefits of noise, local air quality, and greenhouse gas emissions – and the trade-offs in achieving reductions in each.

Why the FAA Chooses this Metric

Mitigating noise directly impacts our ability to increase capacity while sustaining our future. Although building new runways is the best way to increase capacity, communities and local government are reluctant to build them if they impose increased aircraft noise exposure. By mitigating and reducing exposure to excessive noise, FAA can help communities accept more runways in their areas.

The number of people exposed to significant noise levels was reduced by about 90 percent between 1975 and 2000. This is due primarily to the legislatively mandated transition of airplane fleets to newer generation aircraft that produce less noise. Most of the gains from quieter aircraft were achieved by FY 2000. The remaining problem must be addressed primarily through airport-specific noise compatibility programs. The FAA pursues a program of aircraft noise control in cooperation with the aviation community. Noise control measures include noise reduction at the source, i.e., development and adoption of quieter aircraft, soundproofing and buyouts of buildings near airports, operational flight control measures, and land use planning strategies. The FAA is authorized to provide funds for soundproofing and residential relocation, but each project must be locally sponsored and be part of a noise compatibility program prepared by the airport sponsor and approved by FAA.

The base year for setting the target is 2005. This base year was selected starting with FY10 to account for

the significant changes to the commercial fleet from the previous baseline. The target remains at a rate of reduction of one percent in 2006 and a four percent compounded reduction from 2007 to present.

Environmental trends based on expansion of the U.S. air transportation system show that noise exposure is likely to move upwards as traffic growth continues – even taking into account forecasted fleet changes and implementation of beneficial new air traffic procedures. The agency's ability to develop next generation technologies and have the broadest possible array of available noise mitigation approaches at its disposal will affect FAA's ability to continue making significant improvements in aviation noise exposure.

Public Benefit

Public benefit is reduced exposure to unwanted aircraft noise and increased capacity, reducing airport congestion and delays.

Partners

Partners include government agencies worldwide and the aviation industry through the International Civil Aviation Organization (ICAO), who periodically update noise standards and methodologies. The FAA has also partnered with NASA in the development of continuous lower energy, emissions and noise (CLEEN) technologies for civil subsonic jet airplanes to help achieve NextGen goals to increase airspace system capacity by reducing significant community noise and air quality emissions impacts in absolute terms and limiting or reducing aviation greenhouse gas emissions impacts on the global climate.

External Factors Affecting Performance

The primary external factors affecting performance are market forces that drive changes in commercial aircraft fleets and operations. Other external factors include providing FAA the authority and funding to accelerate the implementation of new aircraft emissions and noise technology, and providing funding to FAA's Airport Improvement Program. These programs help foster the type of fleet and performance change required to meet either our current target or historic experience.

Source of the Data

The Model for Assessing Global Exposure to the Noise of Transport Airplanes, MAGENTA, is used to track airport noise exposure. MAGENTA uses updated population data from the 2000 Census projected to the current year to account for population growth. The data source for airport traffic is FAA's Enhanced Traffic Management System (ETMS). This database has replaced the original source, the Official Airline Guide (OAG). Unlike the OAG, the ETMS database includes unscheduled air traffic, which allows for more accurate modeling of freight, general aviation, and military operations. The ETMS also provides more details on aircraft type for a more accurate distribution of aircraft fleet mix.

Since ETMS does not provide future data on flight operations, FAA uses the Terminal Area Forecast (TAF). TAF provides information on how operations will increase on an airport specific basis. Therefore, the current year's result is classified as preliminary until the following year when projected data are finalized, based on actual numbers of operations. Data on the number of people relocated through the Airport Improvement Program are collected from FAA regional offices. Local traffic utilization data are collected from individual airports and updated periodically.

A task group formed to develop MAGENTA by the Committee on Aviation Environmental Protection (CAEP) under the International Civil Aviation Organization (ICAO) has thoroughly reviewed the model's population exposure methodology and has validated it for several airport specific cases. MAGENTA played an important role in the setting of new international aircraft noise standards by CAEP in 2001. CAEP has used MAGENTA to assess the benefits (reduction in number of people exposed to aircraft noise) of several noise stringency proposals.

Statistical Issues

This metric is derived from model estimates that are subject to errors in model specification. Trends of U.S. noise exposure may change due to annual improvements to the noise exposure model. A major change to MAGENTA (Model for Assessing the Global Exposure of Noise because of Transport Airplanes) would result in a significant change in the estimate of the number of people exposed to significant noise levels around US airports. Improvements to the estimate of the number of people exposed to significant noise levels will continue as FAA plans to replace MAGENTA with the Aviation Environmental Design Tool (AEDT).

Completeness

No actual count is made of the number of people exposed to aircraft noise. Aircraft type and event level are current. However, some of the databases used to establish route and runway utilization were developed from 1990 to 1997. Changes in airport layout including expansions may not be reflected. The FAA continues to update these databases as they become available. The benefits of federally funded mitigation, such as buyout, are accounted for.

The noise studies obtained from U.S. airports have gone through a thorough public review process, either under the National Environmental Policy Act (NEPA) requirements or as part of a land use compatibility program.

Performance metric data for the current year (forecasted data) are calculated and reported during the period of July and August, and the data are finalized by May of the following reporting year.

Reliability

The Integrated Noise Model (the core of the MAGENTA model) has been validated with actual acoustic measurements at both airports and other environments such as areas under aircraft at altitude. External forecast data are from primary sources. The MAGENTA population exposure methodology has been thoroughly reviewed by an ICAO task group and was most recently validated for a sample of airport-specific cases.