



Point-to-Point®

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Asset Value and the Aircraft Maintenance Revolution

Long before Boeing committed to building the revolutionary 787 Dreamliner, the company had already embarked on programs to revolutionize aircraft maintenance. Airlines, eager for opportunities to streamline operations and reduce costs, worked closely with Boeing to help shape the future of aircraft maintenance.

Why should the financial community also be interested in aircraft maintenance? The answer is simple: airplane asset value.

The airplane's value as an asset is vital in the determination of financial terms for airplane acquisitions. In asset-based financing, the maintenance condition of the asset is a crucial variable in managing risk.

Maintenance condition reflects the cost of outstanding maintenance, how much time has passed since the airplane's last maintenance check, the quality of past maintenance, and the quality of maintenance and operational records.

Today, determining and keeping track of an aircraft's maintenance condition presents challenges to financiers. Variability of maintenance practices makes it difficult to predict airplane maintenance condition, and maintenance documentation does not provide the transparency necessary for gauging maintenance-related economic risk.

Boeing is bringing technology to bear on the maintenance process to reduce complexity, variability, and economic risk to airplane owners and investors.

Airplane maintenance, which seems such a simple concept, is currently highly complex in practice. The airplane owner or operator must orchestrate the activities of scores of functional groups within the airline; at the aircraft and engine manufacturers; at hundreds of parts suppliers and contract maintenance providers; and at regulatory agencies. Moreover, maintenance processes differ according to aircraft type, age, operational history, and airline business model.

As a consequence of the tangle of supplier relationships and variable maintenance practices, a typical commercial airplane will



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amass shelves full of records as it ages. Boeing Commercial Aviation Services offers business solutions that help airlines simplify and standardize maintenance through efficient management of information and infrastructure.

Electronic Flight Bag, Airplane Health Management, and Integrated Materials Management are three important examples of business solutions that use information technology to streamline maintenance and reduce economic risk to financiers.



Electronic Flight Bag is standard on the 787 and available for 737NG, 777, 747-400 and 747-8 airplanes.

Electronic Flight Bag (EFB) replaces volumes of paper documents and checklists that pilots have traditionally carried to the flight deck. It allows airlines to update and distribute documents, instructions, routing information and crew assignments electronically. Pilots use EFB to calculate takeoff and payload performance on the runway, giving airlines flexibility to make the most of the airplane's revenue capacity and fuel economy. Of greatest interest to financiers, EFB captures a digital record of pilot fault reports and details of the airplane's maintenance and operational history. Linked to a central maintenance database, this information can help owners make a complete and up-to-date assessment of the airplane's maintenance condition.

Airplane Health Management (AHM) monitors the airplane's condition in flight, providing real-time decision support to airline operations and maintenance personnel on the ground. AHM transforms cryptic fault codes and performance data into prognostics information

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Boeing 2006 Current Market Outlook Summary (2006-2025)

Market size		Demand by region	\$bn	Units
Market value:	\$2.6 trillion	Asia Pacific	930	7,900
New airplanes required:	27,210	North America	740	9,490
		Europe	620	6,600
New airplanes required		Middle East	160	1,110
Regional jets	3,450	Latin America	110	1,680
Single-aisle airplanes	16,540	Africa	40	430
Twin-aisle airplanes	6,230			
Large airplanes	990	Fleet size	2005	2025
		Regional jets	2,710	5,040
		Single-aisle	10,580	21,470
		Twin-aisle	3,070	8,070
		Large	970	1,390
		Total	17,330	35,970

The 2006 Current Market Outlook is available online at <http://www.boeing.com/commercial/cmo/index.html> and will be featured in the next issue of Point-to-Point.

787 Tally, as of 9/5/06 — 377 Firm Orders, 420 Announced Orders and Commitments, 32 Customers

(787 Program Milestones on page 4)

that allows airlines to resolve maintenance issues before they cause major schedule delays or flight cancellations. The system prioritizes fault reports so airlines can schedule service efficiently. AHM's fleet-wide statistical analysis and prognostication ability help avoid unscheduled maintenance, which increases aircraft utilization. For financiers, this can mean fewer outstanding maintenance issues when the time comes to evaluate the airplane.

Integrated Materials Management (IMM) transfers much of the responsibility and cost for managing spare parts and logistics from the airlines to Boeing and its global team of logistics partners. The IMM team retains ownership of spare parts inventories so airlines pay for parts only when the parts are delivered to the work site for installation on the airplane. Parts are deployed near airline maintenance operations for prompt delivery directly to the work site. Boeing manages logistics, warranty, order tracking, and inventory replenishment.

For airlines, this means lower acquisition costs and a streamlined supply chain. For financiers, reducing the initial spares and logistics component of acquisition cost means that the airplane's asset



Technical experts co-located at the Boeing Commercial Airplanes Operations Center are available every day, around the clock, to help operators maintain airplane asset values and keep airplanes in peak revenue-earning condition.

value can cover a larger percentage of the initial investment. And, because parts and delivery processes are standardized, the maintenance condition is more transparent and predictable.

These and other Boeing maintenance offerings are accessible worldwide through the MyBoeingFleet.com portal, the world's largest business-to-business website. MyBoeingFleet.com allows airlines to completely manage the technical interface with Boeing, suppliers, MRO (maintenance, repair, and overhaul) contractors, and financiers.

More than 20 airlines have already signed on as customers for Boeing maintenance solutions. These customers represent the full spectrum of commercial carriers, from large network and international airlines to the most successful low-cost carriers. Standardizing maintenance procedures across the spectrum of carriers will help reduce the variation that creates economic risk.

GoldCare, the next level of lifecycle management service, will be introduced concurrently with the 787's entry into service. GoldCare takes advantage of the advanced capabilities of the 787 airplane to integrate today's Commercial Aviation Services (CAS) maintenance solutions with the services of suppliers and MRO providers. In addition, GoldCare will streamline and standardize maintenance operations, whether they are performed by the airline, an MRO provider, or a combination of both. The result is consistent maintenance quality, streamlined maintenance records, and reduced economic risk.

Ultimately, GoldCare will integrate all aircraft maintenance stakeholder interests into a single solution. Financiers will be able to visit the MyBoeingFleet.com web portal to access complete, up-to-date information on their airplanes' maintenance condition—including service bulletin status, repair history, maintenance check status, and the as-flying configuration—by airplane tail number.

Boeing is committed to integrating the interests of the financial

community into its products and services. Boeing airplanes and business solutions provide more efficient ownership transfer, enhanced operator credit worthiness, and improved lifecycle asset value. ■

GoldCare Enhances 787 Lifecycle Value

GoldCare is Boeing's comprehensive lifecycle management service, specially developed for the 787 Dreamliner. It offers airlines a new strategic business model for acquiring, operating, and transitioning their fleets.

Under GoldCare, Boeing leads and integrates a global team of partners specializing in maintenance, engineering, and spares logistics. GoldCare services are tightly integrated into the operational processes and business model of each airline. Airlines pay an agreed-upon per-flight-hour price, which makes many of the costs of running an airline predictable and responsive to the airline's activity and revenue cycles.

GoldCare frees airlines to focus on their passengers and core business activities, with the confidence that the airline can count on optimum dispatch readiness and maximum airplane utilization.

Far beyond being a services integration program, GoldCare leverages the Dreamliner's technical innovation to reduce airline operating costs and enhance the airplane's residual value—which could facilitate advantageous financing.

According to Bob Avery, Boeing's vice president of 787 Support & Services, there is a strong trend for airlines to use the most efficient maintenance and support providers. In addition, airlines are already looking to Boeing to provide business solutions that integrate technical support services and harness Boeing's industry-scale purchasing and contracting advantages to reduce costs. The technical innovation of the 787 gives Boeing an unprecedented opportunity to integrate its established services capabilities with the expertise of Boeing's global partners.

Boeing welcomed its first three supplier partners to its GoldCare team in July. SR Technics was named GoldCare's first maintenance provider partner, while Smiths Aerospace and Hamilton Sundstrand are the first component suppliers to sign on. More supplier partners will be announced this year.

Getting these highly respected providers integrated into GoldCare strengthens the service and signals to customers that GoldCare will be

GoldCare Simplifies Airplane Ownership Makes Costs Predictable



GoldCare smooths the peaks and valleys of ownership costs (grey), making costs more predictable (gold). Availability and reliability are guaranteed. Total maintenance costs are significantly reduced (gold bar) compared to traditional maintenance programs (red bar).

Two GoldCare Service Offerings

Airlines may choose from two GoldCare services to match their business models:

GoldCare: A lifecycle management solution offering guaranteed dispatch reliability levels through comprehensive fleet maintenance management and spare parts support. Boeing manages a globally recognized team of maintenance providers and component suppliers for GoldCare customers, and provides GoldCare Integrated Materials Management Service, as well.

GoldCare Integrated Materials Management Service: A comprehensive logistical and supply chain integration service for spare parts, including repair and overhaul of components, with Boeing providing guaranteed parts availability service levels.

ready to go to work well before they receive their first 787s.

GoldCare builds on the experience that Boeing has gained in the commercial aviation services market. GoldCare benefits directly from the success of offerings such as the Integrated Materials Management program, which guarantees parts availability and reduces spares inventories for nine customers, including Japan Airlines, All Nippon Airlines, Delta, and AirTran—and Airplane Health Management, which enables customers, including Singapore Airlines and Etihad, to predict airplane maintenance requirements and to schedule service to optimize airplane availability and avoid airline schedule disruptions.

With the 787 entering into service in 2008, GoldCare is already generating significant interest, with several customers considering proposals. The financing community is also paying attention, as GoldCare standardizes maintenance, repair, and modification procedures. This greatly reduces variation among Dreamliners covered by the program, throughout the service life of the airplanes. As a result, it will be easier for airlines, leasing companies and financiers

to place GoldCare airplanes with other operators. Residual values will therefore remain high, which should give financiers greater flexibility to develop innovative financing.

The reception of the GoldCare financial story has been very positive because GoldCare keeps a digital record of the airplane's maintenance and operational history. This reduces the time it takes and the cost to transition airplanes to the next owner. For leasing companies and financiers that's a huge area of uncertainty and cost that GoldCare can minimize, making the 787 an even more valuable asset.

This type of lifecycle support was pioneered by aircraft engine manufacturers over recent years with great success. Boeing is now, for the first time, extending the convenience and economy of lifecycle support at the airframe level with the Dreamliner. Boeing is confident that this revolutionary new business model can help airline owners or operators become lower cost carriers. ■

Aircraft Retrofits Part of the Lifecycle Solution

Two things are certain to happen during the long productive life of a commercial jetliner: technology will advance and cabin interior styles will change.

Boeing's lifecycle approach to aviation services and support is designed to go beyond merely keeping up with technology and

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Boeing provides parts kits, engineering, and management for interior, avionics, and structural modifications.

Commercial Aviation Services (CAS) Fact Sheet

Everyday Boeing is Supporting...

12,000 Airplanes
900 Airline Operators
150 Maintenance, Repair and Overhaul Facilities

24/7/365 Operations

12,500 Structural Repairs
14,000 Part Orders
28,000 Shipments per week from eight distribution centers worldwide
92,500 Maintenance and Flight Manuals
135,000 Customer Service Requests

Worldwide Operations

8,000 Boeing Professionals
330 Field Service Representatives
12 Spares Distribution Centers
10 Technical Support Centers
8 Continental Data Graphics Facilities
6 Component Services Centers
2 Component Services Program Partners in Europe

Jeppesen – A Boeing Company

Serving 600 airlines and 850,000 pilots in more than 200 countries, Jeppesen offers a comprehensive suite of flight management products and services, leading the world in delivering navigational information to general, business, and commercial aviation.

17 Global locations
35,000 Flight plans and weather briefs per day
78,000 Navigational charts
150,000 Information updates every 28 days
950,000 Unique data records

Alteon – A Boeing Company

Through its worldwide network of training centers, Alteon offers one-stop pilot, cabin crew, and maintenance training on both Boeing and Airbus models.

400 Airline customers
31,000 Students annually
21 Training locations in 11 countries
70 Advanced full-flight simulators and maintenance training devices

passenger preference. Boeing focuses on providing business solutions that help airlines and leasing companies stay ahead of the upgrade requirement curve.

For example, retrofitting in-service 737NGs and Classics with fuel-saving winglets makes it easier for operators to use these airplanes interchangeably with the latest 737s. In addition, 737s with winglets can operate profitably in a wider variety of markets and meet regulatory requirements throughout the world. This translates directly into a stronger resale market and a larger pool of potential financiers.

Owners can upgrade 737 flight decks with the latest flight management, Electronic Flight Bag, GPS, and heads-up display technologies to make existing 737s consistent with today's fast-selling 737NGs. Flight deck commonality enables operators to standardize maintenance, crew training, and flight operations throughout the fleet. For owners, these improvements can mean increased asset value and liquidity.

For 757 and 767 owners, Boeing offers Extended-Range Twin-Engine Operations (ETOPS) retrofits that will allow airplanes not originally equipped for ETOPS service to take advantage of the growing trend toward long-distance, point-to-point service.

Boeing upgrades are recognized by regulatory agencies around the world as consistent with manufacturer aircraft certification standards. This eliminates many delays associated with modifications provided by other sources. Anticipating eventual transfer of ownership, the Boeing lifecycle approach incorporates improved record keeping, which reduces ownership transfer costs and delay by making aircraft maintenance condition more transparent.

Passenger cabin upgrades are particularly important to help airlines bridge the interval between a new airplane order and the delivery of the new jetliners. For example, the 767 Enhanced Interior upgrade captures the look and feel of the 777 Boeing Signature Interior so faithfully that several airline customers are considering keeping the airplanes in service even after their new 787 Dreamliners are delivered.

Upgraded hardware, software, and engineering are only part of a business solution. Boeing provides a wealth of industry experience and information to help owners select the upgrades that will deliver the greatest return on their retrofit investment, identify the best airplane candidates, and determine the best sequence for modifying the airplanes. Boeing works with airlines to bundle upgrade tasks with scheduled maintenance to eliminate redundant activities and minimize the time that airplanes must be out of service.

When at last a jetliner reaches the end of its passenger-carrying career, the Boeing Converted Freighter program can extend the airplane's productive life even further. Boeing helps the owner assess the market for the converted freighter, manages and integrates all aspects of the conversion process, and can even help the owner establish contact with other owners and operators who have requirements for converted freighters.

Boeing lifecycle business solutions, including airplane upgrade and modification products, protect airplane asset values and enable airplane owners to be confident that their Boeing airplanes are in peak revenue-earning condition. ■

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Noteworthy Developments

Boeing Program Update:

737:

- First 737-800 with short-field performance enhancement delivered to GOL.
- First 737-800 with production-installed Electronic Flight Bag delivered to Egyptair.
- First 737 with production-installed seatback in-flight entertainment system delivered to Jet Airways.
- Newest single-aisle airplane – 737-900ER – rolled out for flight testing.

747

- First cargo loader unveiled for 747 Large Cargo Freighter to transport 787 assemblies.
- 747-400F and -400ER Freighter orders announced by Cathy Pacific, Nippon Cargo, and LoadAir Cargo.
- Purchase agreement signed by Emirates SkyCargo for 10 Boeing 747-8 freighters.

777:

- Purchase of 777 Freighters agreed by Flyington Freighters.
- Firm configuration of new 777 Freighter completed.

787:

- 787 livery revised to enhance airplane performance.
- Major assembly of first 787 Dreamliner started.
- 787 demonstration wing box completed for certification testing.
- SR Technics, Smiths, and Hamilton Sundstrand named to GoldCare team to provide lifecycle management service.
(See photo)



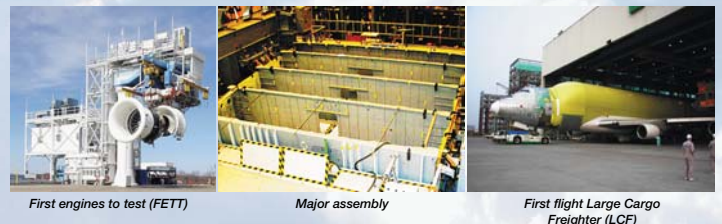
Commercial Aviation Services:

- Carmen Systems acquired to expand information management and operations solutions. Carmen now operates as part of Jeppesen, a wholly owned subsidiary of Boeing.
- Agreement to acquire Aviall, largest independent provider of new aviation parts and services, to help grow Boeing services business.
- Boeing Integrated Materials Management program signs SIA Engineering as first MRO partner in managing spare parts.

787 Development Schedule on Track



Planned progress in 2006



First engines to test (FETT)

Major assembly

First flight Large Cargo Freighter (LCF)

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