



# Innovation aloft

The 737 Boeing Sky Interior and performance improvements extend 737 market leadership

By Jay Spenser

The world's best-selling jetliner will soon be even more popular for airlines and passengers alike. On April 28, Boeing unveiled the 737 Boeing Sky Interior—a new passenger cabin for the Next-Generation 737 based on the 787 Dreamliner—and a suite of performance improvements that will further enhance the twinjet's operating costs, fuel consumption and environmental performance.

"Boeing recently delivered its 6,000th 737 and more than 2,000 Next-Generation 737s are on order," said 737 Chief Project Engineer John Hamilton, Boeing Commercial Airplanes. "This record attests to the 737's proven ability to continually incorporate improvements that add value to the customer."

## REDEFINING THE 737 FLYING EXPERIENCE

The all-new 737 Boeing Sky Interior will debut in service in late 2010. Inspired by the 787 Dreamliner's advanced interior, it's a cabin design that promises to redefine the 737 travel experience. Seven airline customers already have ordered this interior, which is optional for existing Next-Generation 737 operators but standard for all new customers.

Boeing also announced a performance improvement package offering a 2 percent reduction in fuel consumption through various airframe and engine improvements. Airplanes delivered from mid-2011 onward will see these benefits.

"The changes mark the latest chapter in a history of continuous innovation that began when the 737 first entered service three decades ago," Hamilton said. Since then, 737 operators worldwide have benefited from constant infusions of value-added technology, including two major-derivative updates, each of which delivered an essentially new airplane.

Boeing's dedication to ongoing improvement is clear in today's Next-Generation 737. Available in four model sizes seating from 110 to 220 passengers in a two-class configuration, the Next-Generation 737 family boasts many technological firsts, including its fuel-saving blended winglets, advanced flight-deck displays, and satellite-based navigation and landing capabilities.

## 737 BOEING SKY INTERIOR

At the Customer Experience Center in Renton, Wash., south of Seattle, airline customers can walk through mock-ups of Boeing jetliner interiors. Lately, one new mock-up has been surprising airline executives familiar with the Next-Generation 737. On entering the Dreamliner-inspired 737 Boeing Sky Interior, they often think they're in a different airplane.

"We had a couple of airlines' executives who just couldn't believe we hadn't widened the 737 fuselage," said Alan Wittman, 737 Boeing Sky Interior program manager, Engineering. "The chief financial officer of one even asked us for a tape measure so he could check the cabin width for himself. What a wonderful validation of our intended architectural impact!"

How can this new cabin be so different? The answers begin at the threshold, where cove lighting, curving architecture and softer accents create a more spacious and welcoming entryway. Passengers boarding from the jetway will sense immediately they've left behind the airport hustle and bustle and can relax.

As they proceed down the aisle, they'll find things very



**PHOTO:** Stepping aboard a Next-Generation 737 with the new 737 Boeing Sky Interior, passengers will notice that the new entry offers a welcoming transition from the jetway. Cove lighting and curved architecture create a distinctive entry and greater openness in the cabin. **BOEING**

different. Instead of shelf-type stow compartments bordering the aisle, the 737 Boeing Sky Interior features stow bins that tuck up and out of the way when closed. "The result: a roomier, more open in-flight environment with unobstructed views, whether passengers are standing or seated," said Kent Craver, regional director, Passenger Satisfaction and Revenue. And for the first time in any single-aisle jetliner, window-seat passengers can get in and out of their seats easily and gracefully.

Years of research went into these 787-style pivoting bins, which Boeing first introduced on the 777. Because they more closely match the shape of standard carry-on roller bags, the bins maximize the space for overhead stowage. With more bags stowed above, there's more legroom available below.

"Functionality was our No. 1 priority with the pivoting bins," said Dean Habersetzer, manager for the 737 Boeing Sky Interior at the Interiors Responsibility Center, which is part of Commercial Airplanes Fabrication. (See sidebar on Page 49.) "Of course, we also considered weight, cost, ergonomics, reliability, manufacturability and certification requirements. The result is a breakthrough bin design that will let 737 passengers store more luggage closer to their seats, yet contributes to a more open cabin environment."

These bins also feature an easy-to-use latch that works whether passengers pull or push it from either the top or the bottom. The latch was developed for the 787 and, in fact, is the identical part. This commonality is another example of Boeing's focus on saving airlines money by reducing spares provisioning requirements.

Several centers of excellence across Boeing collaborated to create the 737 Boeing Sky Interior. Among these is Teague, the industrial design firm that has teamed with Boeing in airliner interior developments since the propeller era. Teague experts and their Boeing counterparts work side by side—often at the Commercial Airplanes Payloads Concepts Center—to advance the state of the art.

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promises air travelers a greater sense of familiarity and continuity across the Boeing product line,” said Miguel Remedios, lead Teague designer for the 737 Boeing Sky Interior. “This will be true whether they board a Next-Generation 737, 787 Dreamliner or 747-8 Intercontinental.”

Carried over from the 787, an advanced light-emitting diode (LED) lighting scheme washes the ceiling with blue light, which suggests an open sky overhead and makes the airplane feel more spacious.

New sidewalls also foster a connection to the sky. Sculpted window reveals direct passengers’ eyes outside. The windows themselves, now rounder, are also slightly larger because they use all the available viewing area of the external windows, unlike the squared design on current 737s.

At the base of these sidewall panels, new integrated air return grilles have been made tamperproof, which saves inspection time for airlines required to perform security checks before flights. Together with a revised installation of noise-damping material against the airplane’s interior skin, the revised grille also makes for a quieter cabin.

Other improvements also make the 737 even more pleasant for passengers. For example, those reaching up for the reading-light switch will be less likely to press the attendant call button by accident, thanks to a more intuitive design inspired by the 787. Airlines will spend less time and money replacing light bulbs because the LED reading lights last 40,000 hours—10 times as long as the current halogen bulbs. And cabin announcements will be easier to hear because each row now has its own speakers.

“Everything that our 737 Boeing Sky Interior team has accomplished reflects an overarching Boeing interiors philosophy, as pioneered with the Dreamliner, which is to reconnect passengers with the magic of flight,” Craver said.

The 737 Boeing Sky Interior also promises to help Boeing operators succeed through faster and easier boarding and deplaning, increased passenger preference and enhanced

perceptions of the airline’s brand. In turn, these factors help set the stage for increased market share and higher revenues.

## PERFORMANCE IMPROVEMENTS

Complementing the new interior is a package of Next-Generation 737 performance improvements that targets a 2 percent fuel consumption improvement by 2011. Aerodynamic refinements to reduce airframe drag will yield about half this improvement, with changes to the airplane’s CFM56-7B fanjet engines providing the rest.

“The Next-Generation 737 already is the most efficient airplane in its class, so finding changes to make it even more so was highly challenging,” said Ed Kane, chief engineer for 737 Product Development. “What our engineering team ultimately came up with is a suite of changes that are relatively simple to make. In fact, a number of these modifications could potentially be retrofitted as interchangeable parts that operators could use in place of current airplane components.”

Continental Airlines will make a 737-800 available to Boeing to flight-test the engine and airframe improvements, which promise to further solidify the 737 family’s market leadership.

“These performance enhancements offer our customers a significant opportunity to reduce their fuel consumption and operating costs,” said Jon Robinson, 737 Performance Improvement Package team leader. “They also offer environmental benefits in terms of reduced carbon emissions. At Boeing, we are committed to doing the right thing, and this is another step in that direction.” ■

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**PHOTOS:** The new 737 Boeing Sky Interior features sculpted window reveals to direct the passenger’s eyes to the view outside the window; larger stowage bins that pivot up and out of the way to create more headroom and more room to store bags; and an air return grille that is integrated into the sidewall to create a quieter cabin. BOEING

# Interiors Responsibility Center

In a nondescript building at the Boeing plant in Everett, Wash., is a remarkable organization that supports the new 737 Boeing Sky Interior. Employees with the Interiors Responsibility Center—part of Commercial Airplanes Fabrication—played a major role in defining and prototyping this new passenger cabin and will provide it with finished components.

The IRC designs, manufactures, assembles and integrates overhead stowage compartments, sidewalls, ceilings, crew rests, closets, partitions and other furnishings for Boeing jetliners. A global Boeing center of excellence, the IRC competes with other airliner interiors suppliers around the world for the company's business, a requirement that keeps it agile.

With engineering and manufacturing capabilities all housed under one roof, the IRC can move as quickly as an independent company. "Morale is high among our dedicated employees. We also pride ourselves on our Lean+ philosophy and we've achieved dramatic reductions in flow times and inventory," said Dean Habersetzer, the IRC manager responsible for the 737 Boeing Sky Interior.

Today, almost all of the IRC's major deliverables—from stow bins to crew rests to sidewalls—are built on moving assembly lines. Production processes ensure that these interior components are delivered when and as needed to the twin-aisle Boeing jets built in Everett and the single-aisle Next-Generation 737s assembled in Renton, Wash.

"The IRC is proud of its role in the 737 Boeing Sky Interior, which it helped define and whose production it will support," Habersetzer said. "Among the many important capabilities we brought to this effort was the ability to rapidly prototype whatever people could imagine. For example, we turned out early versions of the pivoting bins that proved invaluable for testing, design reviews and trial installations in engineering mock-ups. And we made sure to get feedback from the assembly-line technicians



**PHOTO:** Engineer Jeri Imhoff demonstrates the more intuitive placement of buttons in the passenger service unit inside a mock-up of the new 737 Boeing Sky Interior located at the Customer Experience Center in Tukwila, Wash. The service unit was redesigned based on passenger research conducted for the 787 Dreamliner. Engineers Steve Lin and Brent Walton look on with Kent Craver, regional director of Passenger Satisfaction and Revenue for Boeing Commercial Airplanes. MARIAN LOCKHART/BOEING

who will install 737 Boeing Sky Interiors in new Next-Generation 737s beginning late next year."

"Early on, the IRC and the 737 Program committed to a 'One Team' approach for our part of this major cabin development effort," added Brent Walton, the 737 Boeing Sky Interior manager for Engineering, Commercial Airplanes. Experts from both camps relocated to the Boeing campus in Bellevue, Wash., which is about halfway between Everett and Renton. "We worked side by side for almost a year before returning to our home organizations. That one-team collaboration ensured a better product and fewer problems than would otherwise have been possible," Walton explained.

– Jay Spenser