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100- to 150-Seat Large Civil Aircraft from Canada
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Good morning. I'm Sebastien Mulloot. Since 2008, I've served as the Director of the C Series Program in Bombardier's Commercial Aircraft division. In this role, I'm responsible for the C Series business case, and I also support sales campaigns and accompany customers through entry into service. I've been with Bombardier for 17 years, holding positions spanning the company's rail transportation and business aircraft units.

Today, I appreciate the opportunity to introduce you to the C Series. I'll first explain the origins of the aircraft and how it was a response to unmet customer needs. Next, I'll walk you through a high-level timeline of the aircraft's development, including key milestones and challenges. Finally, I'll share an overview of the aircraft's groundbreaking features that enable efficiency, operational flexibility, comfort, and environmental benefits unparalleled among single-aisle aircraft—and that set it apart from Boeing's products.

A. Origins of the C Series

Bombardier's efforts to develop the C Series began around 2004, when we conducted a study that identified an opening in the lower end of the single aisle market. At the time, none of our products could accommodate over 100 seats. And the Airbus A320 and Boeing 737 targeted a larger capacity—well above 150 seats. No other new aircraft were specifically designed for this smaller size range. Older jets like the MD-80 and Boeing 717 were in service but were expected to need replacing within 10-15 years.

The lack of new aircraft offerings wasn't for lack of demand. Data showed that for over 50% of departures, airlines would not have optimally sized aircraft going forward. That is, their planes would take off with a lot of unused capacity. Airlines themselves confirmed this; they were expressing interest in an offering in the lower seat range.

But we recognized that airlines weren't looking just for a certain seat capacity. Smaller single-aisle aircraft were disadvantaged in the U.S. First, average seat costs per trip were higher due to the lower seat count. Second, pilot contracts were more expensive for planes larger than 100 seats. So airlines needed a breakthrough in operating efficiency to offset these costs. They also wanted features that no manufacturer to date had been able to integrate into a single aircraft of that size.

Bombardier not only saw an opportunity, but believed it had a unique capability to capture it. Our experience developing business and regional jets gave us helpful perspectives on how to build a better small single-aisle commercial aircraft. By contrast, Boeing and Airbus have focused on larger aircraft like the 737 and A320, and their flagship double-aisle widebodies.

B. Development

The process of developing the C Series was an iterative one, as this timeline on Slide 2 shows.

In 2006, we completed our first design iteration. Potential airline customers told us this iteration didn't yield the major gains in economic efficiency they wanted: namely, a minimum 15% cash operating cost improvement.

Between 2006 and 2008, we made technical improvements to meet the airlines' cost improvement target. For example, we integrated the Pratt & Whitney geared turbofan engine. This engine enabled an improvement in fuel burn and noise reduction. We also made bolder

technology choices, using more advanced materials and more integrated systems. The result was a lighter and more efficient aircraft.

In 2008, we reached our target of a 15% operating cost improvement. This was the trigger for securing our initial customer, Lufthansa, in 2009.

In 2016, both the CS100 and CS300 received FAA certifications.

Here, I want to respond to one point that I understand Boeing has raised. Boeing alleges that Bombardier is in a position to rapidly increase C Series imports into the U.S. market in the near term. This allegation doesn't accurately represent our ramp-up capabilities. The C Series is a clean-sheet design—the aircraft manufacturer equivalent of a start-up. Bombardier is still on a learning curve, working to optimize the supply chain and final assembly operations so it can meet delivery dates for existing U.S. and international customers.

Now, I'll explain some of the most innovative features of the C Series.

C. C Series Today

Today, the C Series is the most efficient and technologically advanced single-aisle commercial aircraft in the skies. As seen on **Slide 3**, the C Series is on the cutting edge along four main dimensions—efficiency, operational flexibility, passenger experience, and environmental benefits.

The C Series family delivers a 15% cash operating cost advantage and a 20% fuel burn advantage, making this family ideal for longer, thinner routes—by “thin,” we mean that there are generally not enough passengers to warrant a larger aircraft. This means airlines can service far-flung points that previously wouldn't have been profitable or possible to connect.

The C Series also boasts significant operational flexibility. The shorter landing and takeoff field lengths enable the planes to service a wider range of destinations. Cabin

configuration can be easily customized to a particular airline's needs and adjusted as those needs evolve.

Besides delivering best-in-class economics, we wanted the C Series cabin to ensure an excellent passenger experience. Although there's only one aisle, a wide cross section and larger windows, seats, and overhead bins create a widebody feel. These features added additional weight, but we decided not to compromise.

Lastly, the C Series family is a community-minded aircraft. Efficiency gains like reduced fuel burn and emissions translate into a smaller carbon footprint. The engine also features reduced noise levels. Back in 2008, noise was more of an afterthought for airlines and manufacturers, but it's now increasingly a concern as airport restrictions grow more strict.

Slide 4 shows some of the positive feedback we've received from customers. This praise has confirmed that we've been able to deliver on our promises.

You've heard a bit about what the C Series family is. Now I'll tell you what it isn't—a substitute for the 737 family. As **Slide 5** states, the fundamental difference from a product perspective is that the C Series is a brand new technology, custom-built from the ground up and optimized for the small single-aisle segment, with all of the efficiencies and performance metrics I've already discussed. The 737-700, by contrast, is really just a smaller version of the 737-800. But simply shrinking an aircraft doesn't enable much weight reduction or efficiency gain—most of the systems and components remain unchanged. Moreover, the 737-700 has old technology generally.

As for the 737 MAX 7, the story is similar—no real competition with the C Series. The MAX 7 is Boeing's attempt at breathing new life into an aging platform by using a new engine. But there have been few takers, and many customers may convert to the MAX 8.

In fact, as you see here on **Slide 6**, in discussing the Delta deal, Mr. Conner admitted that the MAX does not compete directly with the CS100. Here's another example involving the MAX 7: Air Canada purchased CS300s to replace Embraer e-jets, and the MAX 8 to replace A320s. The MAX 7 really wasn't even in the picture. In fact, as shown on **Slide 7**, Boeing's investor communications compare the MAX family only with the A320neo family. So even Boeing doesn't really believe that the C Series is competing with the 737 MAX 7.

In closing, this aircraft was born out of a genuine market need and evolved over years of research and development. And today, we're proud that the C Series is delivering on its promises to airline customers and passengers.

Thank you.