Trends in Fleet and Aircraft Retirement

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June 2015
Agenda

- Passenger fleet
  - Products
  - Operators
  - Ownership

- Freighter fleet

- New and used airplanes

- Aircraft retirement

- Program update: ecoDemonstrator
Unprecedented, two models (737 / A320) will dominate single-aisle fleet

- ~80% of in-service passenger fleet
- ~85% of single-aisle backlog
- Combined production rates approaching 100/month

Data source: Western jets with >90 seats; Flightglobal Ascend May-18-2015; Boeing analysis
Widebody fleet will become more concentrated

- 777 & A330 account for ~60% of in-service pax widebodies

<table>
<thead>
<tr>
<th>Backlog (Flightglobal Ascend as of May-25-2015)</th>
</tr>
</thead>
<tbody>
<tr>
<td>777 / 777X</td>
</tr>
<tr>
<td>552</td>
</tr>
</tbody>
</table>

Data source: Western jets with >90 seats; Flightglobal Ascend May-18-2015; Boeing analysis
Geographical diversity calls for global parts distribution

- Growth of middle class in emerging economies
- Liberalization and sixth freedom carriers
- LCC global expansion

<table>
<thead>
<tr>
<th>Year</th>
<th>Single-aisle</th>
<th>Widebody</th>
</tr>
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<tbody>
<tr>
<td>1984</td>
<td>4,000 units</td>
<td>1,400 units</td>
</tr>
<tr>
<td>1999</td>
<td>7,500 units</td>
<td>2,800 units</td>
</tr>
<tr>
<td>2014</td>
<td>13,500 units</td>
<td>3,700 units</td>
</tr>
</tbody>
</table>

Data source: Western jets with >90 seats; Flightglobal Ascend May-18-2015; Boeing analysis
Increasing operating lease share in passenger fleet

Data source: Western jets with >90 seats; Flightglobal Ascend May-18-2015; Boeing analysis
Changes in freighter fleet

- Widebody share of freighter fleet has nearly doubled since 1999
- 757s and 737-300/400s led recent uptick in narrow-body conversion
- Average age for 737-300/400 conversion has risen to 23 years

Data source: Western jets with >90 seats; Flightglobal Ascend May-18-2015; Boeing analysis
Emerging markets are taking a greater share of both new and used airplanes.

Data source: Western jets with >90 seats; Flightglobal Ascend May-18-2015; Boeing analysis.
Growing retirements drive strong demand for recycling capacity

Airplanes retired (western jets with >90 seats, excluding hull losses)

Data source: Western jets with >90 seats; Flightglobal Ascend May-18-2015; Boeing analysis

15,000 aircraft to be retired in the next 20 years
Retirement age averaged 25-28 for pax and 31-38 for freighters over the past 15 years.

**Single-aisle excl. hull losses**
- Pax: 28 years
- Freighter: 38 years

**Widebody excl. hull losses**
- Pax: 25 years
- Freighter: 31 years

Data source: Western jets with >90 seats; Flightglobal Ascend May-18-2015; Boeing analysis.
ecoDemonstrator Program
Accelerate, Collaborate, Inspire

• **Accelerate technology**
  - Learn by doing, reduce risk
  - Speed implementation
  - 18 to 24 month rhythm

• **Collaborate** with government, suppliers and industry

• **Inspire** action and innovation
• Maximize residual value of aircraft materials for aerospace and other industries

• Disassemble, dismantle and recycle the 757 ecoDemonstrator airframe

• Demonstrate environmental solutions for aircraft at End-Of-Service (EOS) to gain key knowledge on airframe reuse and recycle processes
Takeaways

• 737NG/MAX and A320ceo/neo will dominate the single-aisle fleet
• Widebody fleet will become more concentrated
• 757s and 737-300/400s led recent uptick in narrow-body freighter conversion
• Worldwide fleet and increasing operating lease demand global parts distribution
• Emerging markets are taking a greater share of both new and used airplanes
• Growing aircraft retirements drive strong demand for recycling capacity
• Boeing is dedicated to bettering aircraft end-of-service solutions

Additional info: Key Findings on Airplane Economic Life