Agenda

- Business Environment
- Commercial Market Outlook
- BCA Titanium Usage
- Affordability Focus
- Supply Chain Strategy
Business Environment

- Cost reduction pressures
- Highly competitive landscape
- Global economy growth
- Oil prices rising
- Geopolitical uncertainty
- Increase regulation - trades, tariff, duty
- Factory digital transformation
- Speed of technology development
- More for less – customer and productivity focus critical
The CMO is our long-term forecast of global air travel, new airplane demand and commercial services

Airplanes
$6.3T

Services
$8.8T

$15T

All jets >30 seats and freighters in commercial service

Services required to support the operation of commercial aviation

Copyright © 2018 Boeing. All rights reserved.
20-year forecast:
Continued long-term growth

World economy (GDP): 2.8%
Commercial services ($): 4.2%
Cargo traffic (RTK): 4.2%
Passenger traffic (RPK): 4.7%
Air travel growth varies by market

- *Within Asia Pacific*: 6.1%
- Within China: 2.8%
- Within North America: 3.0%
- Within Europe: 3.6%
- Middle East - Asia Pacific: 6.2%
- North Atlantic: 3.0%
- Europe - Asia Pacific: 4.3%
- North America - Latin America: 5.5%
- Within Latin America: 6.0%
- Transpacific: 3.5%
- Within/to Russia and Central Asia: 4.1%
- Europe - Latin America: 4.3%
- Africa - Europe: 4.6%

*Does NOT include travel within China*

World GDP Growth: 2.8%
World Traffic Growth: 4.7%
Airlines will need 42,700 new airplanes valued at $6.3 trillion

**Airplane deliveries: 42,700**
- Regional jet: 2,320 (5%)
- Single-aisle: 31,360 (73%)
- Widebody: 8,070 (19%)
- Freighter: 980 (2%)

**New airplane values: $6.3T**
- Regional jet: $110B (2%)
- Single-aisle: $3,480B (55%)
- Widebody: $2,480B (39%)
- Freighter: $280B (4%)

Copyright © 2018 Boeing. All rights reserved.
Asia Pacific responsible for 40% of future airplane demand

New airplane deliveries by region
2018 - 2037

<table>
<thead>
<tr>
<th>Region</th>
<th>Airplanes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia Pacific</td>
<td>16,930</td>
</tr>
<tr>
<td>North America</td>
<td>8,800</td>
</tr>
<tr>
<td>Europe</td>
<td>8,490</td>
</tr>
<tr>
<td>Middle East</td>
<td>2,990</td>
</tr>
<tr>
<td>Latin America</td>
<td>3,040</td>
</tr>
<tr>
<td>Russia &amp; Central Asia</td>
<td>1,290</td>
</tr>
<tr>
<td>Africa</td>
<td>1,190</td>
</tr>
<tr>
<td>World Total</td>
<td>42,700</td>
</tr>
</tbody>
</table>

Market values by region
2018 - 2037

<table>
<thead>
<tr>
<th>Region</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia Pacific</td>
<td>$2,670B</td>
</tr>
<tr>
<td>North America</td>
<td>$1,100B</td>
</tr>
<tr>
<td>Europe</td>
<td>$1,240B</td>
</tr>
<tr>
<td>Middle East</td>
<td>$660B</td>
</tr>
<tr>
<td>Latin America</td>
<td>$360B</td>
</tr>
<tr>
<td>Russia &amp; Central Asia</td>
<td>$150B</td>
</tr>
<tr>
<td>Africa</td>
<td>$170B</td>
</tr>
<tr>
<td>World Total</td>
<td>$6,350B</td>
</tr>
</tbody>
</table>

Copyright © 2018 Boeing. All rights reserved.
Open demand is there... more than 65% left to sell

2017-2036

---

**Regional Jet**
- **1,670**

**Single-aisle**
- **18,650**

**Small widebody**
- **3,640**

**Medium/Large widebody**
- **2,260**

**Freighter**
- **790**

---

Solid shading = backlog, light shading = market opportunity (freighter also includes conversions)

SOURCE: Ascend backlog as of 5/31/2017

---

Copyright © 2018 Boeing. All rights reserved.
BCA production rates and aerospace titanium demand
Anticipate ~80% increase from 2011 through 2019
Affordability Focus Areas

1st Time Quality
- Quality parts
- Rate readiness

Design Cost Out / Lean+
- Value Engineering
- Productivity improvements

Supply Chain Architecture
- Strategic sourcing
- Value creation / innovation

Competition / Commercial Rebalancing / Volume
- Risk & Reward
- Statement of work adjustment

Partnering for Success 1.0, 2.0, ...
Titanium is the metal of choice but the cost is limiting the additional use on airplanes.

Titanium benefit in aerospace
- Lightweight characteristics
- Corrosion resistant
- Withstand high temperatures
- Compatible with composites
Future business opportunities are tied to Performance, Best Value, Working Together and PFS.
Competitive landscape
Where are you in the journey?

Grow

Maintain

Reduce/Exit

Potential - New

Future business opportunities are tied to Performance, Best Value, Working Together and PFS
Supply Chain Strategy Keys to Success

Quality, Delivery and Rate Readiness
Working Together, Partnering for Success and Best value
Increase competition, R&D and Innovation

Materials must buy their way onto an airplane and earn the privilege to stay
THANK YOU!