BUILDING THE FUTURE TOGETHER

COMMERCIAL MARKET OUTLOOK 2019–2038

Randy Tinseth
Vice President, Commercial Marketing

17 June 2019
Total Served Market
$8.7T
2.9% CAGR

Commercial Airplanes
$3.1T
3.6% CAGR
20,600 units

Defense, Space & Security
$2.5T
1.2% CAGR

Global Services
$3.1T
3.5% CAGR
Long-term forecast of global air travel, new airplane demand and commercial services

All jets >30 seats and freighters in commercial service

$1T

$8T

$9T

Services required to support the operation of commercial aviation

$16T
Nine years of profitable growth for our customers

Global GDP growth

Traffic growth rates (RPKs)

Net profit ($billions)

SOURCES: IHS Markit, ICAO, IATA and Cirium Fleets Analyzer
Most diverse market in history

**Economies**
- Developing
- Emerging
- Mature

**Networks**
- Short-haul
- Mid-haul
- Long-haul

**Business models**
- Low Cost
- Hybrid
- Network

**Fleet needs**
- Expansion
- Growth
- Replacement
Single-aisles driving global network expansion

~7,000 nonstop markets added past 10 years

60% Network increase since 2008

Sources: FlightGlobal August schedules, Boeing analysis
>30% of long-haul network is new in last decade
Global airplane market trends

Resilient

Sustainable

Productive
Resilient growth market continues

RPKs = Revenue Passenger Kilometers
SOURCE: ICAO scheduled traffic / 2018E/202019F IATA December 2018, GDP (constant $ and exchange rate) from Oxford Economics
Structural factors driving sustainable growth

Global middle class expanding

Emerging and developing market urban population rising

Accessibility and affordability improving

- Global middle class expanding
  - 2003: 1,000
  - 2008: 1,500
  - 2013: 2,000
  - 2018: 2,500
  - 2023: 3,000
  - 2028: 3,500
  - 2033: 4,000

- >$20K annual income
  - 2003: 500
  - 2008: 750
  - 2013: 1,000
  - 2018: 1,250
  - 2023: 1,500
  - 2028: 1,750
  - 2033: 2,000

- <$20K
  - 2003: 500
  - 2008: 750
  - 2013: 1,000
  - 2018: 1,250
  - 2023: 1,500
  - 2028: 1,750
  - 2033: 2,000

- Average yield
  - 1998: $1,500
  - 2008: $2,000
  - 2018: $2,500
  - 2028: $3,000
  - 2038: $3,500

- Emerging and developing market urban population rising
  - 1998: 30.0%
  - 2018: 35.0%
  - 2038: 40.0%

- Accessibility and affordability improving
  - Index, 2000=100
  - Airport pairs
  - Average yield

- Global middle class: 2003 to 2033
- Emerging and developing market urban population: 1998 to 2038
- Accessibility and affordability: 2000 to 2018
Productivity driving sustainable growth

Traffic increasing >x2 the global fleet

- Fleet
- Higher utilization
- Higher load factors
- Densification & other

~6,700 Airplanes
~7,100 Airplanes
Why the Commercial Market Outlook (CMO)?

**Shape**
Our product strategy

**Guide**
Long-range business planning

**Inform**
Suppliers and airline customers
20-year forecast: continued long-term growth

- **World Economy (GDP)**: 2.7%
- **Passenger Traffic (RPK)**: 4.6%
- **Commercial Services ($)**: 4.2%
- **Cargo Traffic (RTK)**: 4.2%
Airlines will need 44,000 new airplanes valued at $6.8 trillion

Airplane deliveries: 44,040
2019 - 2038

New airplane values: $6.8T
2019 - 2038
Fleet will double, composition to shift

Fleet growth rate = 3.4%

24,830 Growth 56%

19,210 Replacement 44%

6,620 Retained fleet

50,660

25,830 25,830

2018 2038

2018 2038

6,620 6,620

SOURCES: Fleet Analyzer & Boeing CMO
Dynamic global market

1980-2000
60-70% of aviation & economic market

2019-2038
50+% of future economic growth
4X population & middle class
Asia Pacific responsible for 40% of future airplane demand

New airplane deliveries by region 2019 - 2038

<table>
<thead>
<tr>
<th>Region</th>
<th>Airplanes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia Pacific</td>
<td>17,390</td>
</tr>
<tr>
<td>North America</td>
<td>9,130</td>
</tr>
<tr>
<td>Europe</td>
<td>8,990</td>
</tr>
<tr>
<td>Middle East</td>
<td>3,130</td>
</tr>
<tr>
<td>Latin America</td>
<td>2,960</td>
</tr>
<tr>
<td>Russia &amp; Central Asia</td>
<td>1,280</td>
</tr>
<tr>
<td>Africa</td>
<td>1,160</td>
</tr>
<tr>
<td>World Total</td>
<td>44,040</td>
</tr>
</tbody>
</table>

Market values by region 2019 - 2038

<table>
<thead>
<tr>
<th>Region</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia Pacific</td>
<td>$2,830B</td>
</tr>
<tr>
<td>North America</td>
<td>$1,155B</td>
</tr>
<tr>
<td>Europe</td>
<td>$1,370B</td>
</tr>
<tr>
<td>Middle East</td>
<td>$725B</td>
</tr>
<tr>
<td>Latin America</td>
<td>$395B</td>
</tr>
<tr>
<td>Russia &amp; Central Asia</td>
<td>$160B</td>
</tr>
<tr>
<td>Africa</td>
<td>$175B</td>
</tr>
<tr>
<td>World Total</td>
<td>$6,810B</td>
</tr>
</tbody>
</table>

World Total 2019-2038: $6.8T
Freighter fleet is growing

Total growth = 21%

5.4% annual growth

3.8% annual growth

2.4% annual growth
Freighter demand – 1,040 new, 1,780 converted
Global services market trends
Commercial aviation will demand $9.1 trillion in services over 20 years

Commercial Aviation Services: $9.1T

2019 - 2038

<table>
<thead>
<tr>
<th>Services</th>
<th>2019</th>
<th>2038</th>
<th>CAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate &amp; External</td>
<td>$155B</td>
<td>$2,400B</td>
<td>3.2%</td>
</tr>
<tr>
<td>Marketing &amp; Planning</td>
<td>$545B</td>
<td>$1,175B</td>
<td>5.2%</td>
</tr>
<tr>
<td>Flight Ops</td>
<td>$1,175B</td>
<td>$4,825B</td>
<td>3.7%</td>
</tr>
<tr>
<td>Maintenance &amp; Engineering</td>
<td>$2,400B</td>
<td>$2,400B</td>
<td>4.0%</td>
</tr>
<tr>
<td>Ground &amp; Cargo Ops</td>
<td>$4,825B</td>
<td>$4,825B</td>
<td>4.1%</td>
</tr>
</tbody>
</table>

Services by Region

2019 - 2038

<table>
<thead>
<tr>
<th>Region</th>
<th>Services</th>
<th>CAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia Pacific</td>
<td>3,480</td>
<td>5.1%</td>
</tr>
<tr>
<td>Europe</td>
<td>1,980</td>
<td>3.3%</td>
</tr>
<tr>
<td>North America</td>
<td>1,865</td>
<td>2.8%</td>
</tr>
<tr>
<td>Middle East</td>
<td>790</td>
<td>4.7%</td>
</tr>
<tr>
<td>Latin America</td>
<td>500</td>
<td>4.7%</td>
</tr>
<tr>
<td>Russia/CA</td>
<td>270</td>
<td>2.7%</td>
</tr>
<tr>
<td>Africa</td>
<td>215</td>
<td>5.0%</td>
</tr>
<tr>
<td>World Total</td>
<td>$9,100B</td>
<td>4.1%</td>
</tr>
</tbody>
</table>
Emerging customer needs drive our products and services
Delivering value to our customers

5,500+ backlog

Services growing faster than market
BOEING’S MARKET OUTLOOK

LEARN MORE
2.2 million commercial aviation personnel needed to fly, maintain world fleet

Boeing Pilot & Technician Outlook 2019-2038

- **645,000**
  - NORTH AMERICA
- **632,000**
  - LATIN AMERICA
- **881,000**
  - ASIA-PACIFIC
- **415,000**
  - EUROPE
- **231,000**
  - MIDDLE EAST
- **75,000**
  - RUSSIA & C. ASIA
- **75,000**
  - AFRICA
- **816,000**
  - NORTH AMERICA