Context

• The Presenter
  – BA Harvard, MST Northwestern, MBA Foster School (U. of Washington)
  – Urban and regional transportation: 6 years including 1½ years in Lille, France
  – AT&T Communications, market analysis: 2 years
  – The Boeing Company: 29 years until retirement 7/1/2013
    • Telecommunications business strategy
    • IT design, project management, and quality assurance
    • Commercial Aviation Services and Marketing: airline value analysis, market analysis, and competitive analysis

• Not representing Boeing: all positions and opinions are presenter’s

• Objectives vis-à-vis audience
  – Context, and something new about the industry
  – Spark questions for research and investigation
  – Give suggestions for those seeking to work in the industry
Airline Operating Costs ("Typical" Airline, 2014)

Source: Boeing internal analysis, used with permission for presentation at Northwestern University 4/28/2016
The Fuel Factor

Oil price outlook uncertain but low

Brent crude oil price

US$ per barrel

2010 2011 2012 2013 2014 2015

Source: Platts, IEA, Press reports

Profit Trend

Record for the airline industry

Global commercial airline profitability

% revenues

0.0

-2.0

-4.0

-6.0

-8.0

-10.0


US$ billion

0

-10

-20

-30

-40

30

40

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Source: ICAO, IATA Economics

Career Factors in the Aviation Industry

- **OEM**
  - Desired background
    - Engineering background preferred; business supplemental
    - Airline experience valued
      - Departmental alignment enhances: e.g. fleet management, maintenance
    - Functional: e.g. accounting, law, supplier management, IT, non-commercial aviation
  - Entry
    - Networking
    - Internships
    - Jobs advertised
  - Career paths
    - Management
    - Technical: many disciplines
    - Marketing and Sales

- **Airline**
  - Fast paced: “day of” emphasis
  - Timeliness and accuracy

- **Business cycle** – timing
Scope: Single and Twin-Aisle > 90 Seats

**FORECAST 2015-2034 DELIVERIES**

- **Single-aisle**: 62% (25,354)
- **Regional jet**: 11% (833)
- **Twin-aisle**: 7% (2,898)
- **Turboprop**: 2% (833)
- **Freighter**: 18% (7,506)

**FORECAST 2015-2034 DELIVERY VALUE ($BN)**

- **Single-aisle**: 46% (1,292.3)
- **Regional jet**: 5% (135.3)
- **Twin-aisle**: 2% (59.6)
- **Turboprop**: 4% (122.4)
- **Freighter**: 43% (1,219.9)

Source: ASCEND / Flightglobal Consultancy
Passenger vs. Cargo

Very different businesses

Airline revenues from passengers and cargo

Revenue from tickets and ancillaries

Revenue from cargo

Source: ICAO, IATA Economics

Globalization has paused

International trade compared to global industrial production

How the Industry Works – Major Players
Life Cycle of an Airplane Sale

Airline Strategic Assessment
OR
Lessor Market Assessment

Prepare to support:
- Provide training
- Deploy maintenance facilities and inventory
- Deploy/train field service

Prepare to introduce into fleet and operate:
- Train personnel: flight, cabin, maintenance
- Deploy maintenance facilities and inventory
- Plan cabin and seat configuration

Negotiate

Procure

Assemble

Test & Accept

Line Start

Install Interior

Deliver

Proposal(s)

Definitive Agreement

RFP
OEM Aftermarket “Services & Support”

- Training
- Parts: “spares” & routine
- Engineering support
  - Field Service: 100’s of offices worldwide
  - Repairs
  - Modifications – SB’s
  - Engineering Data
- Navigational data (Boeing: Jeppesen)
- Information based
  - Airplane health
  - Operations centers
- Consulting
  - Fuel, other operational & business

Boeing Field Service offices
Airbus Field Service and other offices
## Airbus & Boeing Fleet Statistics 2015

<table>
<thead>
<tr>
<th></th>
<th>Airbus</th>
<th>Boeing</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015 Net Orders</td>
<td>1,080</td>
<td>768</td>
</tr>
<tr>
<td>2015 Aircraft Delivered</td>
<td>635</td>
<td>762</td>
</tr>
<tr>
<td>Total Orders (to 3/16)</td>
<td>16,361</td>
<td>23,132</td>
</tr>
<tr>
<td>Total Deliveries (to 3/16)</td>
<td>9,643</td>
<td>17,392</td>
</tr>
<tr>
<td>In Operation (3/16)</td>
<td>8,762</td>
<td>10,000 +</td>
</tr>
</tbody>
</table>

Sources: Airbus and Boeing annual reports
# Airbus & Boeing Financial Statistics 2015

<table>
<thead>
<tr>
<th></th>
<th>Airbus Group</th>
<th>Airbus Commercial</th>
<th>Boeing Company</th>
<th>Boeing Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees</td>
<td>136,574</td>
<td>~ 160,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Orders (1)</td>
<td>$178.7</td>
<td>$156.2</td>
<td>$83.0</td>
<td>$57.0</td>
</tr>
<tr>
<td>Order Book (1)</td>
<td>$1,130.2</td>
<td>$1,070.2</td>
<td>$489.0</td>
<td>$432.0</td>
</tr>
<tr>
<td>Revenue</td>
<td>$72.5</td>
<td>$51.5</td>
<td>$96.1</td>
<td>$66.0</td>
</tr>
<tr>
<td>Op. Earnings (Boeing)</td>
<td></td>
<td></td>
<td>$7.4</td>
<td>$5.2</td>
</tr>
<tr>
<td>PBFCIT (2) (Airbus)</td>
<td>$4.6</td>
<td>$2.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Earnings / PfP (3)</td>
<td>$3.0</td>
<td></td>
<td>$5.2</td>
<td></td>
</tr>
<tr>
<td>Cash &amp; Equivalents – EoP</td>
<td>$8.2</td>
<td></td>
<td>$11.3</td>
<td></td>
</tr>
</tbody>
</table>

(1) New Orders and Order Book / Backlog are based on list prices. Actual prices may be lower.
(2) Airbus PBFCIT = Profit Before Finance Costs and Income Taxes.
(3) Boeing Net Earnings believed to be roughly equivalent to Airbus Profit for Period.

Currency conversion: $1 = €0.89 representative rate for 2015. $1 = €0.92 at EoP on 12/31/15.
Commercial Airplanes

- Delivered 176 airplanes in Q1
- Orders valued at $6B in Q1; robust backlog of $424B
  - Won 121 net orders
- Achieved 737 MAX first flight and began flight test
- Began 12 per month rate in 787 Final Assembly
- Started major assembly early on the 787-10

Revenues & Operating Margins

- $15.4 billion, 10.5% margin in 2015 Q1
- $14.4 billion, 7.2% margin in 2016 Q1

Focusing on execution, quality and productivity
Some Causes of Flight Schedule Delays

- Weather
- Air traffic control
- Passenger
- Security
- Mechanical / technical (tend to be long, “creeping”)
- Flight crew not available
- Cabin crew not available
- Equipment not available
- Previous delay (“Consequential”)
- Facilities
- Damage
- Connecting passenger
- Ramp

**NOTE:** Many airlines do not track the lengths of delays, and/or do not understand their true costs.

Inspired by Boeing analysis, patent pending
Cost of a Flight Delay, by Length of Delay

“Notional”, normalized by seat capacity

Low Schedule Frequency vs. High Schedule Frequency

Strategy: cancel flight

Strategy: recover flight

Inspired by Boeing analysis, patent pending

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The Low-Cost Carrier (LCC) Model

- Primarily point-to-point operations.
- Serving short-haul routes, often to/from regional or secondary airports.
- A strong focus on price sensitive traffic, mostly leisure passengers.
- Typically one service class only, with no (or limited) customer loyalty programmes.
- Limited passenger services, with additional charges for some services (e.g. on-board catering).
- Low average fares, with a strong focus on price competition.
- Different fares offered, related to aircraft load factors and/or length of time before departure.
- A very high proportion of bookings made through the Internet.
- High aircraft utilisation rates, with short turnaround times between operations.
- A fleet consisting of just one or two types of aircraft.
- Private-sector companies.
- A simple management and overhead structure with a lean strategic decision-making process.

Alaska to Acquire Virgin America

Airline Market Segments – N. America

We believe there is significant demand for low-fare carriers that offer a premium product.

Source: Alaska Airlines
**VIRGIN AMERICA’S SUPERIOR BUSINESS MODEL**

**PREMIUM REVENUE GENERATION WITH A LCC COST BASE**

<table>
<thead>
<tr>
<th>MAXIMIZING REVENUE...</th>
<th>VIRGIN AMERICA</th>
<th>LOW COST CARRIERS</th>
<th>LEGACY CARRIERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRST CLASS SERVICE</td>
<td>🚁</td>
<td>🛬</td>
<td>🛬</td>
</tr>
<tr>
<td>LEADING IN-FLIGHT EXPERIENCE</td>
<td>🚁</td>
<td>🛬</td>
<td>🛬</td>
</tr>
<tr>
<td>BRAND PREMIUM</td>
<td>🚁</td>
<td>🛬</td>
<td>🛬</td>
</tr>
<tr>
<td>TOP DESTINATIONS WITH STRONG ALLIANCE NETWORK</td>
<td>🚁</td>
<td>🛬</td>
<td>🛬</td>
</tr>
<tr>
<td>CORPORATE SELLING FOCUS</td>
<td>🚁</td>
<td>🛬</td>
<td>🛬</td>
</tr>
<tr>
<td>ANCILLARY REVENUE STRATEGY</td>
<td>🚁</td>
<td>🛬</td>
<td>🛬</td>
</tr>
<tr>
<td>LOYALTY PROGRAM</td>
<td>🚁</td>
<td>🛬</td>
<td>🛬</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WHILE KEEPING COSTS LOW...</th>
<th>VIRGIN AMERICA</th>
<th>LOW COST CARRIERS</th>
<th>LEGACY CARRIERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SINGLE FLEET TYPE</td>
<td>🚁</td>
<td>🛬</td>
<td>🛬</td>
</tr>
<tr>
<td>YOUNG AND FUEL EFFICIENT FLEET</td>
<td>🚁</td>
<td>🛬</td>
<td>🛬</td>
</tr>
<tr>
<td>POINT-TO-POINT NETWORK</td>
<td>🚁</td>
<td>🛬</td>
<td>🛬</td>
</tr>
<tr>
<td>OUTSOURCING</td>
<td>🚁</td>
<td>🛬</td>
<td>🛬</td>
</tr>
<tr>
<td>HIGH LABOR PRODUCTIVITY</td>
<td>🚁</td>
<td>🛬</td>
<td>🛬</td>
</tr>
</tbody>
</table>
# Combined Airline Statistics

**Alaska + Virgin by the Numbers**

<table>
<thead>
<tr>
<th></th>
<th><strong>Alaska</strong></th>
<th><strong>Virgin America</strong></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Annual Revenues</strong></td>
<td>$5.6 Billion</td>
<td>$1.5 Billion</td>
<td>$7.1 Billion</td>
</tr>
<tr>
<td><strong>Annual Passengers</strong></td>
<td>32 Million</td>
<td>7 Million</td>
<td>39 Million</td>
</tr>
<tr>
<td><strong>Aircraft</strong></td>
<td>152 Boeing 52 Q400 15 regional jets</td>
<td>63 Airbus 200</td>
<td>282</td>
</tr>
<tr>
<td><strong>Daily Departures</strong></td>
<td>1,000</td>
<td>200</td>
<td>1,200</td>
</tr>
<tr>
<td><strong>Destinations</strong></td>
<td>112</td>
<td>24</td>
<td>114*</td>
</tr>
<tr>
<td><strong>Pre-Tax Profit</strong></td>
<td>$1.3 Billion</td>
<td>$200 Million</td>
<td>$1.5 Billion</td>
</tr>
</tbody>
</table>

*AS and VX have 22 current destinations that overlap.

**Source:** Alaska Airlines
Alaska / Virgin American Route Networks

Source: Alaska Airlines
Emergence of Fewer, Larger Airlines

Consolidation has led to dominance of just four airlines.

<table>
<thead>
<tr>
<th>Airline Domestic Market Share (Revenue)</th>
</tr>
</thead>
<tbody>
<tr>
<td>61%</td>
</tr>
</tbody>
</table>

Acquisition Economic Overview

*Significant synergies create value for our owners.*

We expect one-time costs to total ~$300M - $350M

<table>
<thead>
<tr>
<th></th>
<th>Average Annual Run Rate Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue Synergies</td>
<td>$175 M</td>
</tr>
<tr>
<td>Net Cost Synergies</td>
<td>$50 M</td>
</tr>
<tr>
<td>Total Synergies</td>
<td>$225 M</td>
</tr>
</tbody>
</table>

Source: Alaska Airlines
Acquisition Financial Overview

We expect to finance the transaction with cash on hand, aircraft debt and a temporary slowdown of share buybacks.

<table>
<thead>
<tr>
<th>Acquisition Price</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity Purchased</td>
<td>$2.6B</td>
</tr>
<tr>
<td>Net Debt and Leases Assumed</td>
<td>$1.4B</td>
</tr>
<tr>
<td>Total</td>
<td>$4.0B</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Financing Sources</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$0.6M</td>
</tr>
<tr>
<td>Debt and Leases Assumed</td>
<td>$1.4B</td>
</tr>
<tr>
<td>New Debt Issued</td>
<td>$2B</td>
</tr>
<tr>
<td>Total</td>
<td>$4.0B</td>
</tr>
</tbody>
</table>
## Traditional Maintenance Checks

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D / HMV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interval – FH</td>
<td>400-600</td>
<td>(1)</td>
<td>(2)</td>
<td></td>
</tr>
<tr>
<td>Interval – Cycles</td>
<td>200-300</td>
<td>(1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interval - Months</td>
<td></td>
<td>6-8</td>
<td>20-24</td>
<td>72</td>
</tr>
<tr>
<td>Maintenance Hrs</td>
<td>20-60</td>
<td>120-150</td>
<td>Up to 6,000</td>
<td>Up to 50,000</td>
</tr>
<tr>
<td>AC Down Time</td>
<td>Overnight</td>
<td>1-3 days</td>
<td>1-2 wks +</td>
<td>Up to 2 months</td>
</tr>
<tr>
<td>Purposes</td>
<td>Systems, etc.</td>
<td>Systems, etc.</td>
<td>Structural and zone inspections</td>
<td>Deep inspection, overhaul, cabin</td>
</tr>
</tbody>
</table>

(1) May be the same as for A checks.  
(2) May be defined by manufacturer.