Advancements in Aircraft Technology

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InterVISTAS Consulting Group

IAAE Canada Conference, Victoria, BC, June 6th 2012
Aviation Trends
Global Air Passenger Traffic

Source: International Civil Aviation Organization (ICAO) and International Air Transport Association (IATA).
Average Annual Forecast Growth Rate of Passenger Traffic

Source: Boeing Current Market Outlook 2011-2030
Boeing & Airbus Projected Aircraft Deliveries

Source: Airbus and Boeing websites, The Airline Monitor Jan/Feb 2012.
New Aircraft Forecast Deliveries (Long-Term)

Source: Airline Monitor – Commercial Aircraft Monitor, Jan-Feb. 2012
Fuel Efficiency

- Oil prices continue to rise

Crude Oil Spot Prices
January 2007 to March 2012
Composite Construction

- Composite aircraft designs allows for lighter aircraft and less restrictions on design
- Boeing 787 constructed with composites allows for larger windows
- A350 XWB will be over 50% composites
Fuel Efficiency

- Rising fuel costs leading to redesign of aircraft, retooling of engines
  - A320Neo, B737 MAX
- Need for greater efficiency and longer range
Increasing attention to in-cabin experience

- Lower cabin pressure = greater comfort
- Transparent rooflines, mood lighting, ergonomics related to changing demographic of passengers including more women passengers
- Winglets also reduce in-cabin noise

Source: Airbus
Turbo props and business aircraft

• The growing orders for Q400 signals improvements for short-haul routes from new turboprop technologies
  • and in-cabin noise cancellation
• Bombardier projects strong biz aircraft growth to 2030

Source: Bombardier
In 2010 the busiest traffic regions and pairs remain in Western Europe…

Source: EUROCONTROL – Business Aviation in Europe 2010 Briefing
… but the growth can be found in Turkey and the Ukraine

Source: EUROCONTROL – Business Aviation in Europe 2010 Briefing
Fight Deck Enhancements

- Corporate and commercial aircraft benefit
  - Information concentrated in smaller areas
  - Allows for flight crew ease of control
- Vision Flight Deck is industry’s first to feature synthetic vision imagery on HUD’s

Existing Technology  Advanced Technology
Enhancements to Small Aircraft

- Float planes are benefiting from technological advancements
  - Improved cockpit designs and navigational instruments allows for IFR navigation
Engine Technology
Engine Technology

- Engines are quieter, lighter and more fuel efficient (i.e. GEnx)

- Continual testing of bio fuels in search of alternate fuels (Lufthansa trans Atlantic flights)
Engine Technology

• **High Efficiency Engines**
  - Twin ETOPS of 330 min for B777 aircraft & eventually the B787
• **Airbus studying 350min ETOPS for A350 XWB**
• **Longer flights to reach more points non-stop**

Shaded areas represent flight restrictions
Impacts of Long Range Aircraft
Airport Impacts of Long Range Aircraft

- Some airports may be bypassed
- Airports now focused on connectivity
- New aircraft create new non-stop markets
  - UA IAH – AKL / JL NRT – BOS / ET ADD – YYY*  

(*Currently served with B777 with stop in FCO until B787 introduced on route)
Ultra Long-Haul Flights

- US gateways rank high in ultra long haul sectors
  - Longest is SIN – EWR at 10,000nm, 18h55min flying time
- Gulf carriers looking to create one-stop global network through geographic advantage on long-distance routes
  - Though most flights are within 3000 – 4000nm
  - Long hauls are focused on Americas and Australia
- Asia is aviation’s busiest region but few ultra long haul services except to US
Central Asia as the Centre of the World
US Gateways with Long Haul Flights

- Examples of destinations over 6,000nm from East and West Coasts

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<thead>
<tr>
<th>Between</th>
<th>9,000nm+</th>
<th>8,000nm+</th>
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### Persian Gulf Airports with Long Haul Flights

- **Examples of destinations over 6,000nm from Persian Gulf**

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Future Sectors in Long Haul Market

• Better links between Oceana and India
• Northern Asia to points in Africa and South America
• Long haul aircraft may enable more effective trade flows
• North Asia – Latin American market is underserviced
  • Currently need to connect via Europe or North America
• Advancements in aircraft will shrink markets further
Air Traffic Control
Air Traffic Control

- FAA’s NextGEN Program
- Europe’s EUROCONTROL SESAR
- Improving technology creating:
  - Better utilization of space
  - Sequencing tools improve airport capacity
  - Direct routings (cost and time savings)
  - Improved situational awareness (safety)
- **ADS-B will support Airborne Traffic Situational Awareness**
  - Provides in-cockpit position information on other aircraft
FAA’s NextGEN

Source: FAA
New WAAS Coverage Clears the Way for New Access to Airports

The FAA has published more than 3000 Wide Area Augmentation System or WAAS approaches in the US.

Source: FAA
Future of Transport
Dragon is a free-flying, reusable spacecraft developed by SpaceX under NASA's Commercial Orbital Transportation Services (COTS) program.

The Dragon spacecraft is made up of a pressurized capsule and unpressurized trunk used for transport of cargo and/or crew members.

Source: SpaceX
strategic transportation & tourism solutions

Thank You!

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