A sector of its own…

WHAT IS BUSINESS AVIATION?
IN BETWEEN COMMERCIAL AND G.A. OPERATIONS

• Business Aviation is:
  > on demand – non scheduled
  > aircraft with 19 seats and less

• Business Aviation is:
  > the aviation for business
MULTIPLE AIRCRAFT TYPES TO OFFER TAILOR-MADE SOLUTIONS TO CUSTOMER
EUROPEAN FLEET CONTINUES TO CLIMB

Number of BusAv a/c

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of BusAv a/c</th>
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<tbody>
<tr>
<td>2001</td>
<td>1,517</td>
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<tr>
<td>2002</td>
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<tr>
<td>2003</td>
<td>1,517</td>
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<tr>
<td>2004</td>
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<td>2005</td>
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<td>2006</td>
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<tr>
<td>2007</td>
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<tr>
<td>2008</td>
<td>2,000</td>
</tr>
<tr>
<td>2009</td>
<td>2,500</td>
</tr>
<tr>
<td>2010</td>
<td>3,000</td>
</tr>
<tr>
<td>2011</td>
<td>3,000</td>
</tr>
<tr>
<td>2012</td>
<td>3,000</td>
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<tr>
<td>2013</td>
<td>3,000</td>
</tr>
<tr>
<td>2014</td>
<td>3,301</td>
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</table>
EUROPEAN FLEET IS YOUNG – 55% OF AIRCRAFT HAVE LESS THAN 10 YEARS

N° Aircraft/Age

Airframes

Years

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SMALLER OPERATORS

Size of the operators

<table>
<thead>
<tr>
<th>Size of the operators</th>
<th>Number of Operators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 20</td>
<td>9</td>
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<tr>
<td>Between 16-20</td>
<td>10</td>
</tr>
<tr>
<td>Between 11-15</td>
<td>15</td>
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<tr>
<td>Between 6-10</td>
<td>59</td>
</tr>
<tr>
<td>Between 2-5</td>
<td>330</td>
</tr>
</tbody>
</table>
• **96%** – proportion of city pairs served by business aviation that had NO scheduled connection. The remaining 4% represent however more than 1/3 of business aviation traffic in volume.

• **70%** – proportion of business aviation flights taking off and landing at airports handling fewer than 100 departures per day

• **Up to 25%** of operator revenues are derived from multiple destination journeys
APPLICATIONS EGNOS in Business aviation

EGNOS MAKES THE OPERATIONS POSSIBLE
1. IMPROVING SIGNAL INTEGRITY
   • The EGNOS ground stations monitor in real time the satellite signals and correct
   • Integrity Level 10-7 compared to 10-5 "RAIM"?

2. IMPROVING THE ACCURACY
   • Allows you to use the GPS altitude as a vertical guide
   • More likely to display barometric pressure reference error?

3. BEST AVAILABILITY
   • 4 satellites are needed against 5 satellites in the conventional solution "RAIM"
APPLICATIONS- LPV

- BusAv has been the leader for development and certification of LPV avionics
- Virtually ILS Cat 1 (3D) decision height can descend to 200ft
  - Pushing for LPV200 and reduction of minima on all runways
- Possible on all tracks without specific ground equipment
- Eliminates "non-precision approaches"; USA 3,500 LPVs have already been published
- Most to not say all Business Aircraft on production lines are SBAS equipped.
- LPVs specific to helicopters on the helipads
- Medical evacuations and whatever the conditions (IFR, Night, Fog)
• Possibility for airplanes using "SVS / EVS" to operate in terms Cat 2 / Cat 3
• All airports become available whatever the conditions (up to 210 m RVR)
• To improve ADS-B GPS position availability and so to achieve the certification criteria.
• To use SBAS geometric altitude in Vpath to allow a perfect transition between RNP to LPV.
• To develop dual slope LPV approaches to reduce nuisance to airport residents or to reduce the risk of hard landing of the steep approaches.
• In a way to increase capacity and to mitigate wake vortex risks on hub runways, to develop LPV with a threshold set 2000 3000 ft after the normal threshold of the runway.
• Improve “safety in the air” by detecting “misleading baro altitude” (transmission of SBAS Geometric Altitude by ADS-B).
Curbed Approaches

Category B aircraft
IAS: 120 kts
(Falcon 7X Vref: 104 kts)
Wind: 15 kts
Slope: 4.5°
Bank: 25° (135 kts)
Wake Vortex Free Approaches

4°5 LPV SBAS approach
Threshold shift by 1000ft to 2000 ft

SBAS Path 4.5°

ILS GS 3°

Threshold Shift

Minimum wake vortex separation

SL2010-08 TOPOS Applications 100510.ppt

SBAS: Satellite Based Augmentation System
LPV: Localizer Performance with Vertical guidance
THANK YOU FOR YOUR ATTENTION