

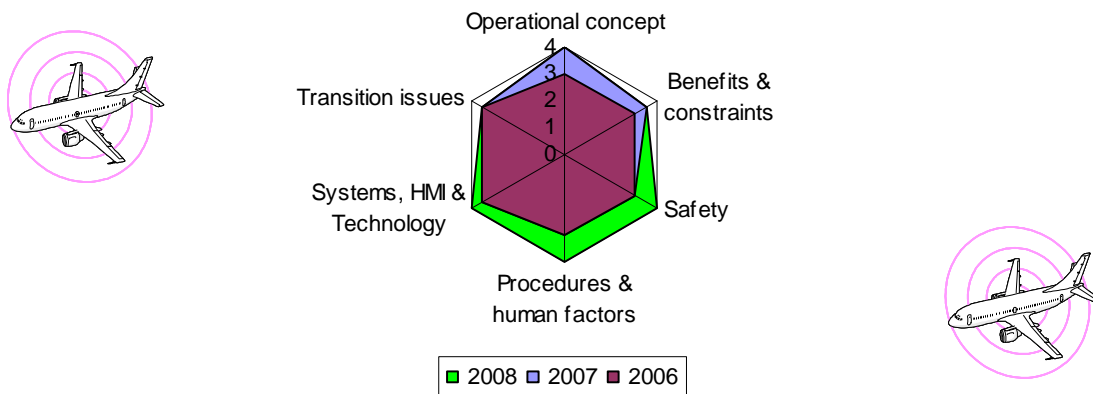
Airborne Separation Assistance System Thematic Network 2  
(ASAS-TN2)

# ASAS application maturity assessment

## Graphical summary

### 2006-8

28<sup>th</sup> March 2008



This handout is based on excerpts from the document "ASAS-TN2 application maturity assessment", Version 3, 7<sup>th</sup> March 2008 (see <http://www.asas-tn.org/reports>)

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## Summary

The global maturity of nineteen applications based on Automatic Dependent Surveillance Broadcast (ADS-B), has been assessed by the European Commission sponsored Airborne Separation Assistance System (ASAS) Thematic Network 2 project. A group of twelve European operational and technical ASAS specialists from industry, service providers and research (BAE Systems (UK), ENAV (Italy), LFV (Sweden), NLR (The Netherlands), Thales Air Systems (France), Thales Avionics (France) and EUROCONTROL) judged maturity based on a set of commonly agreed metrics and their experience in the field.

For each application, maturity scores in the range 0 to 4 were assigned for each of the following metric types: (i) Operational concepts, (ii) Benefits and constraints, (iii) Safety, (iv) Procedures and human factors, (v) Systems, HMI and technology and (vi) Transition issues. The maturity assessment was reviewed externally by peers in Europe, USA and Australia. This is the third annual assessment since 2006.

In the period October 2006 to January 2008, the percentage of European flights sampled that were Mode-S equipped increased from 95.3 % to 97.0 %. ADS-B Extended Squitter indicated capability as a percentage of Mode-S equipped flights increased from 57.3% to 78.3%.

Results indicate that one of the most mature applications is 'ATC surveillance in non-radar areas' with a total score of 23.0 out of a possible 24 (operational daily in Bundaberg, Australia since 2007). The airborne traffic situational awareness applications 'In-trail procedure in procedural airspace' and 'Enhanced visual separation on approach', and the Airborne spacing application 'Sequencing and merging' also seem to have made progress with total scores of 19 and above. The applications judged to be relatively immature are 'Aircraft derived data for ground tools' (ADS-B surveillance category) and 'Vertical crossing and passing' (Airborne separation category) with total scores less than 7.

Over the year from March 2007 to February 2008 the maturity scores of fourteen out of nineteen applications increased (compared with fifteen the previous year) including a new application In-trail Merge (Airborne separation category). 'Sequencing and merging' (Airborne spacing category) showed the greatest annual change in total score from 17 to 20.5 after FAA gave UPS/ACSS operational approval in December 2007.

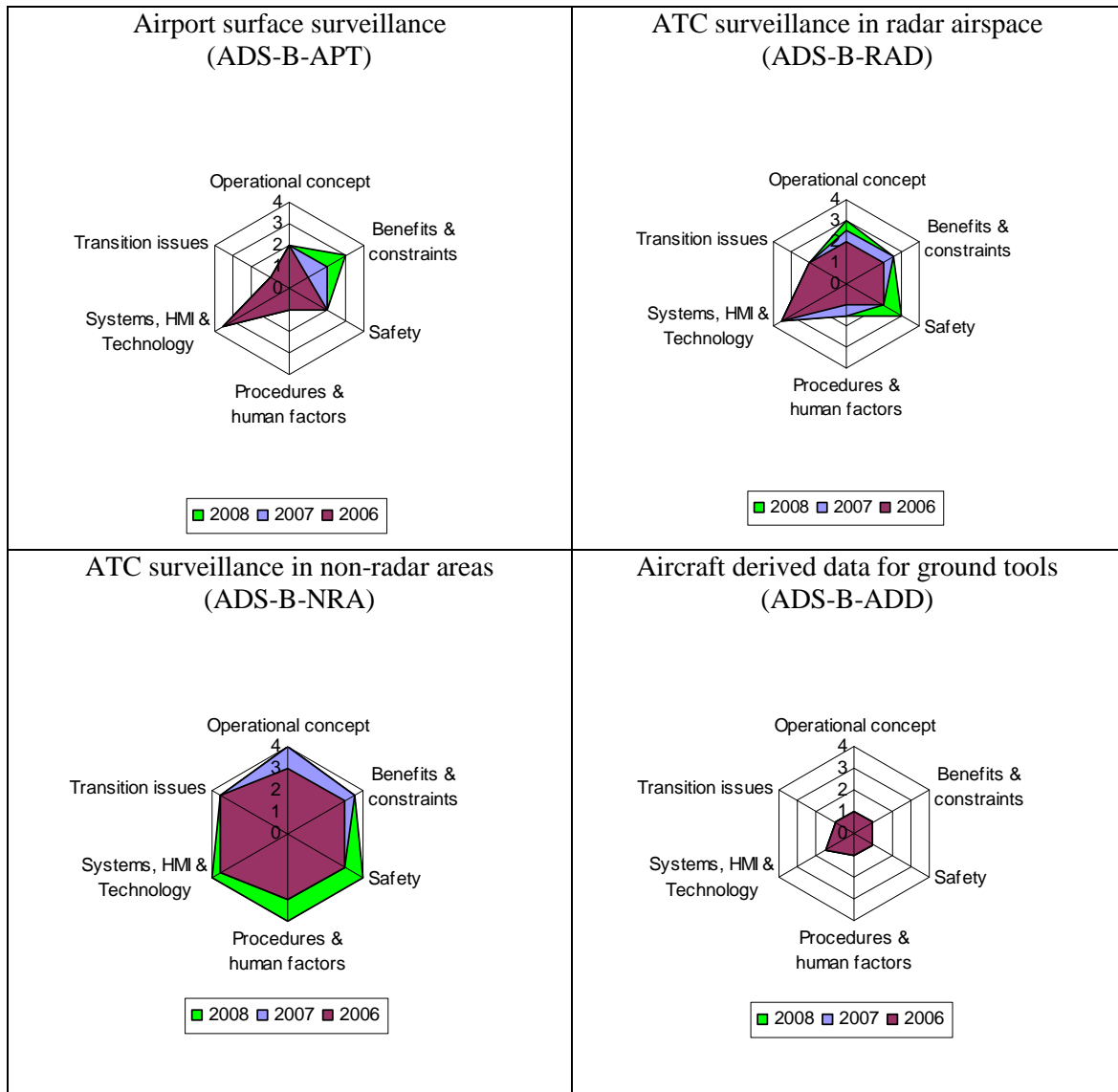
Over the two year period from March 2006 to February 2008 the maturity scores of seventeen out of nineteen applications increased. The total maturity score of the airborne spacing application 'sequencing and merging' increased the most over the two year period from 15.5 to 20.5. The two applications with the lowest scores also matured at the slowest rate over the two year period: 'Aircraft derived data for ground tools' (ADS-B surveillance category) and 'Vertical crossing and passing' (Airborne spacing category) did not change maturity score. . The lack of change in score of Aircraft derived data for ground tools over the three year period implies the application needs to be revisited in the context of SESAR and NextGen.

When grouped in order of increasing ASAS functionality, the maturity tends to decrease on average. The relatively high initial airborne self-separation scores given in 2006 can perhaps be explained by the free flight research initiatives in the US and Europe during the previous decade with airborne separation category applications catching up more recently.

## Graphical summary

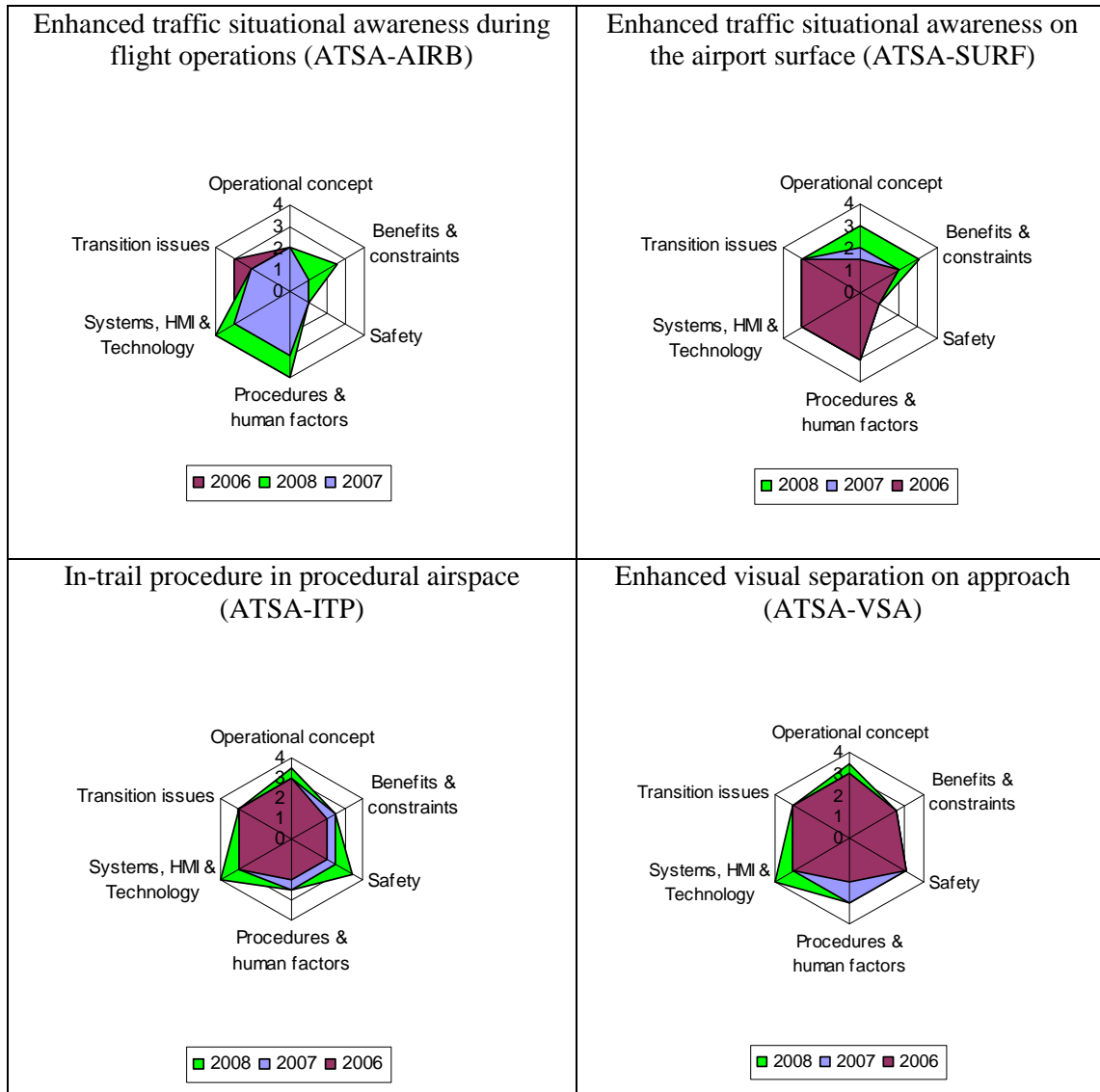
The following diagrams try to give an indication of the overall level of maturity of each application with respect to the six criteria selected for the assessment. The size of the shaded area does not necessarily reflect the readiness for deployment because all axes may not carry equal weight. The values for three consecutive years 2006-8 are shown on the same axes for comparison.

### ADS-B surveillance



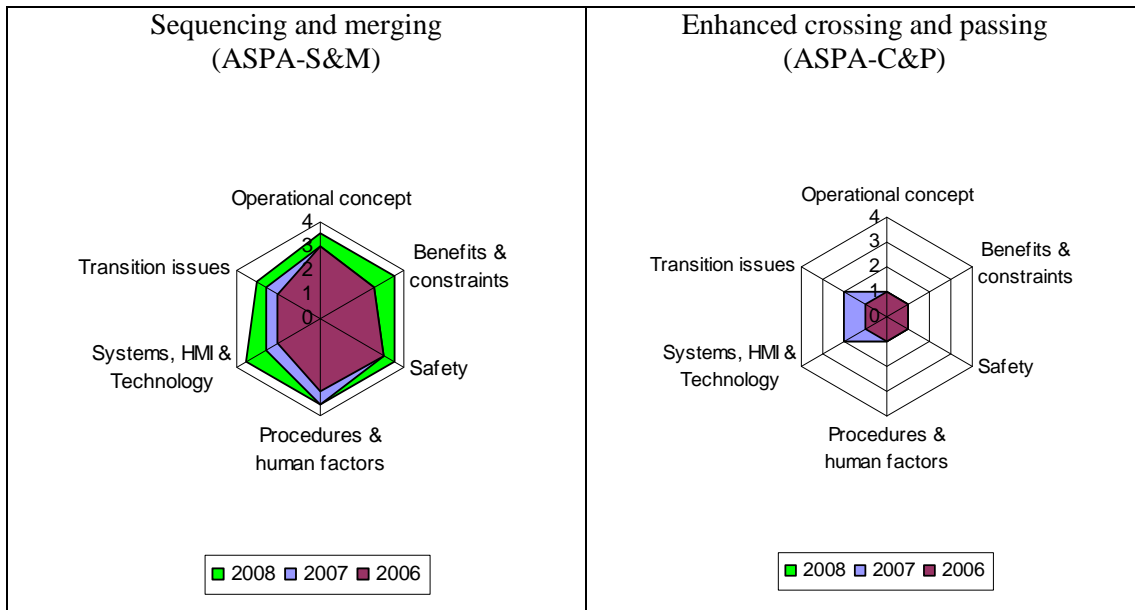
**Figure 1: ADS-B surveillance applications maturity summary**

**Airborne traffic situational awareness**



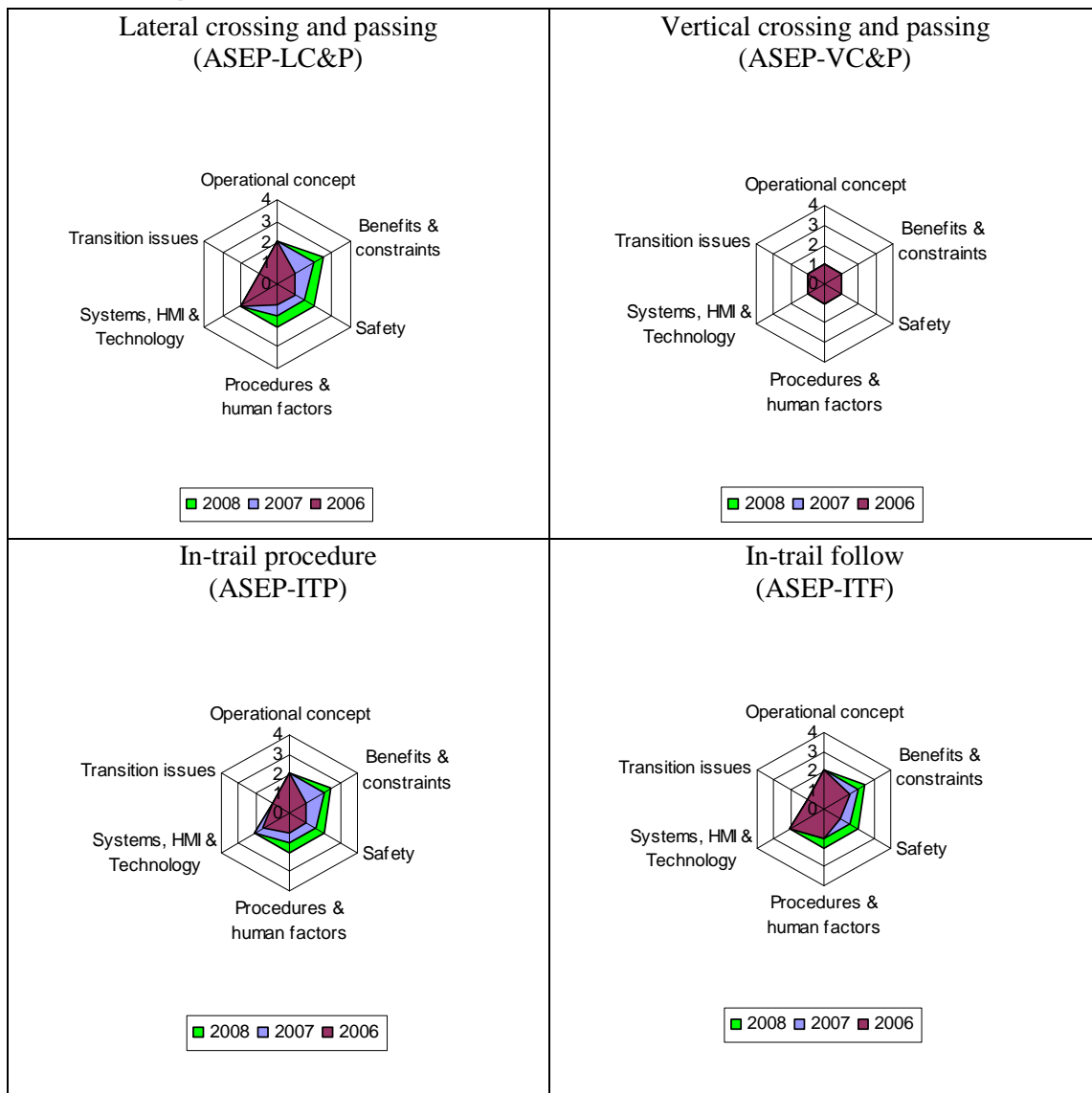
**Figure 2: Airborne traffic situational awareness applications maturity summary**

**Airborne spacing**



**Figure 3: Airborne spacing applications maturity summary**

**Airborne separation**



**Figure 4: Airborne separation applications maturity summary**

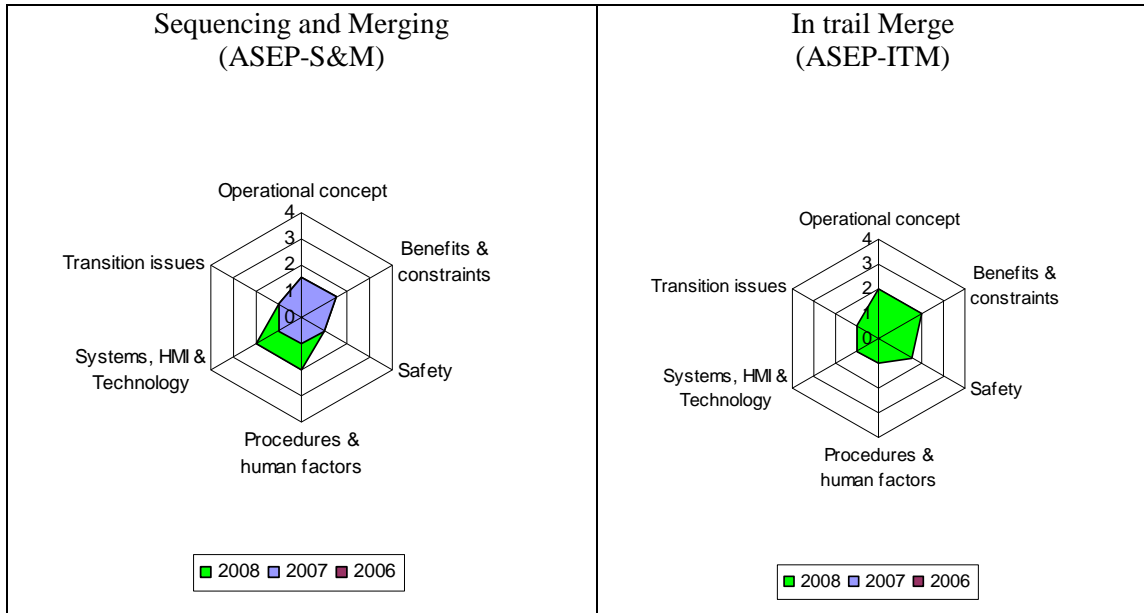
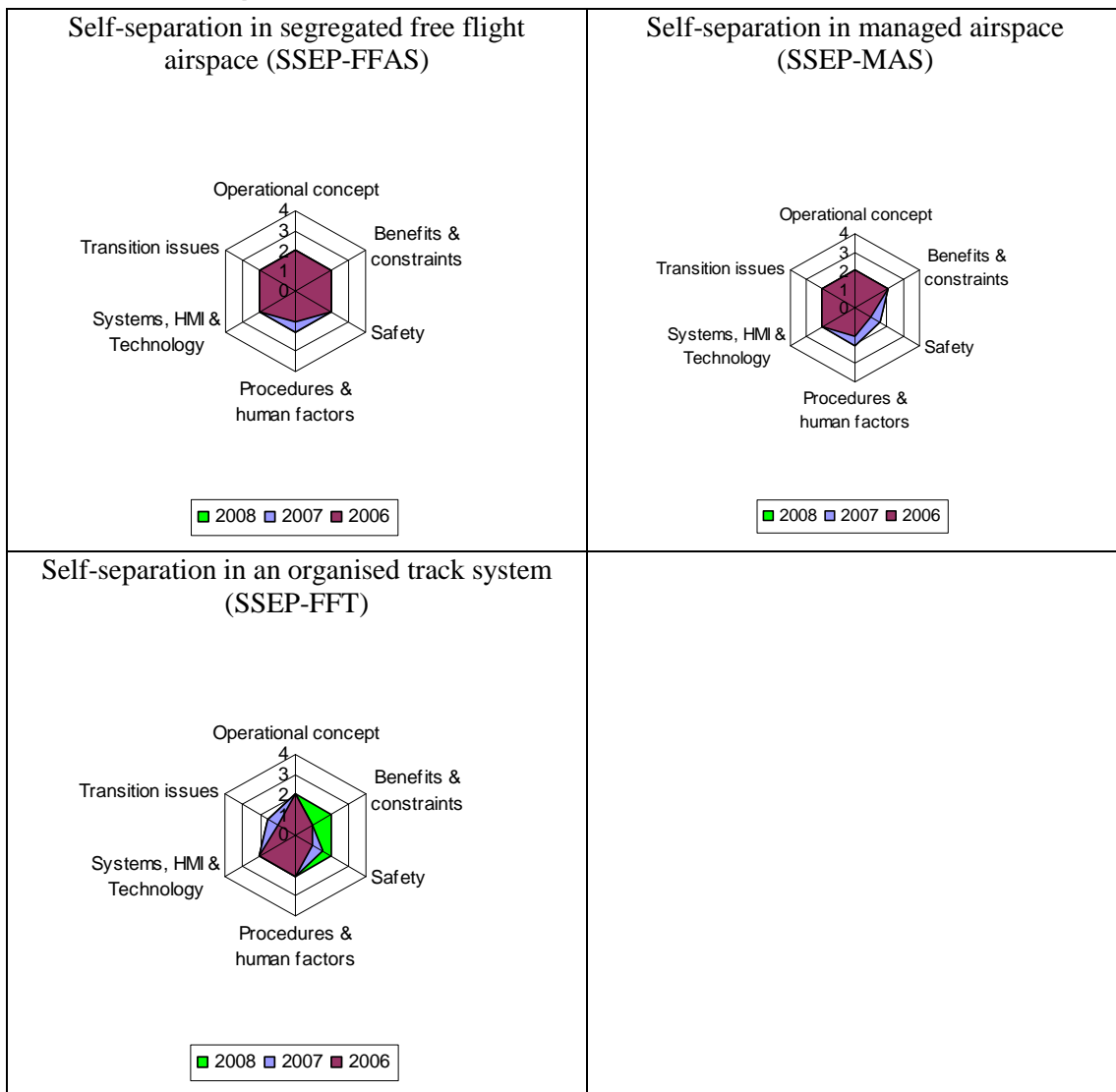


Figure 5: Airborne separation applications maturity summary (2)



**Airborne self-separation**



**Figure 6: Airborne self-separation applications maturity summary**

### Trend over three year period 2006-8

Figure 12 gives an overview of the total maturity score of each application per year over the period from March 2006 to February 2008. The applications are grouped by surveillance and ASAS categories. The order corresponds to increasing on-board functionality with which can be seen a trend of decreasing maturity. The relatively high initial self-separation scores can perhaps be explained by the free flight research initiatives in the US and Europe during the previous decade with separation category applications catching up more recently.

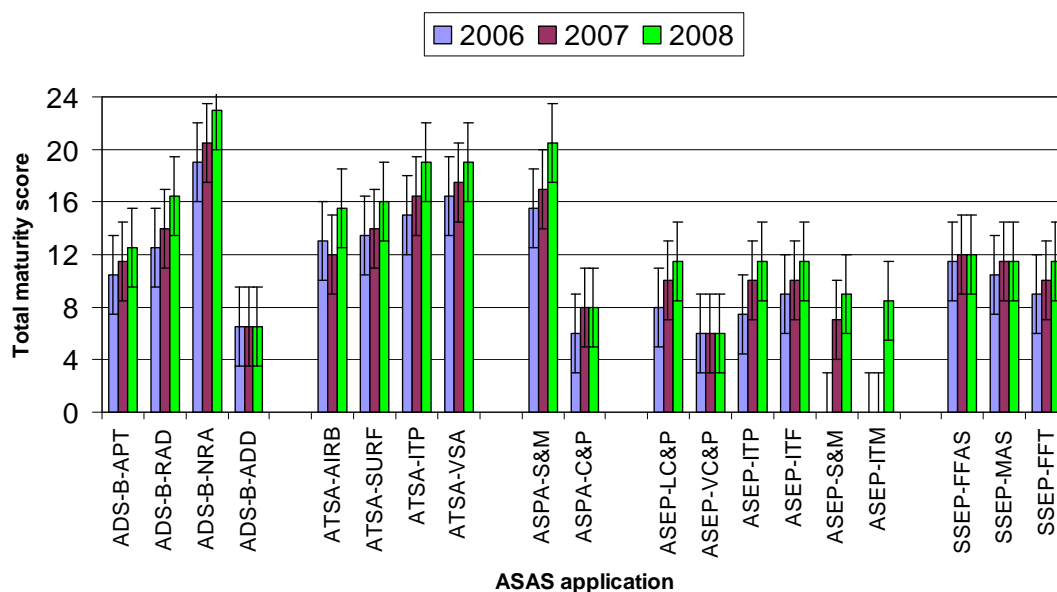


Figure 7: Total maturity score per application for each of the three years 2006-8

#### ASAS-TN2 consortium:

BAE Systems (UK), ENAV (Italy), LFV (Sweden), NLR (Netherlands), Thales Air Systems (France), Thales Avionics (France), IFATCA (International Federation of Air Traffic Controllers' Associations), and EUROCONTROL