



HELIOS

Improving safety by reducing General Aviation airspace infringements

Ben Stanley

Helios



Contents

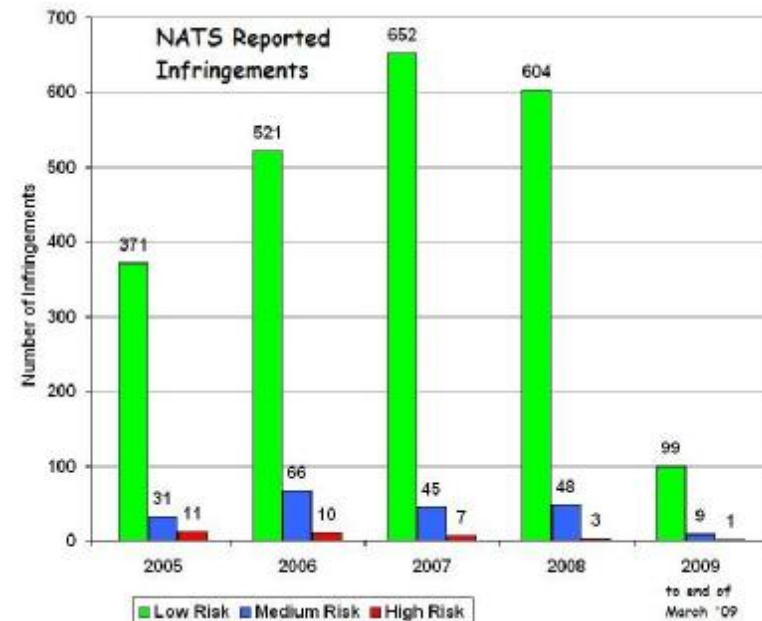
- A bit of background
- The anatomy of airspace incursions
- The independence issue
- An airborne safety net for infringements
- The cost of safety



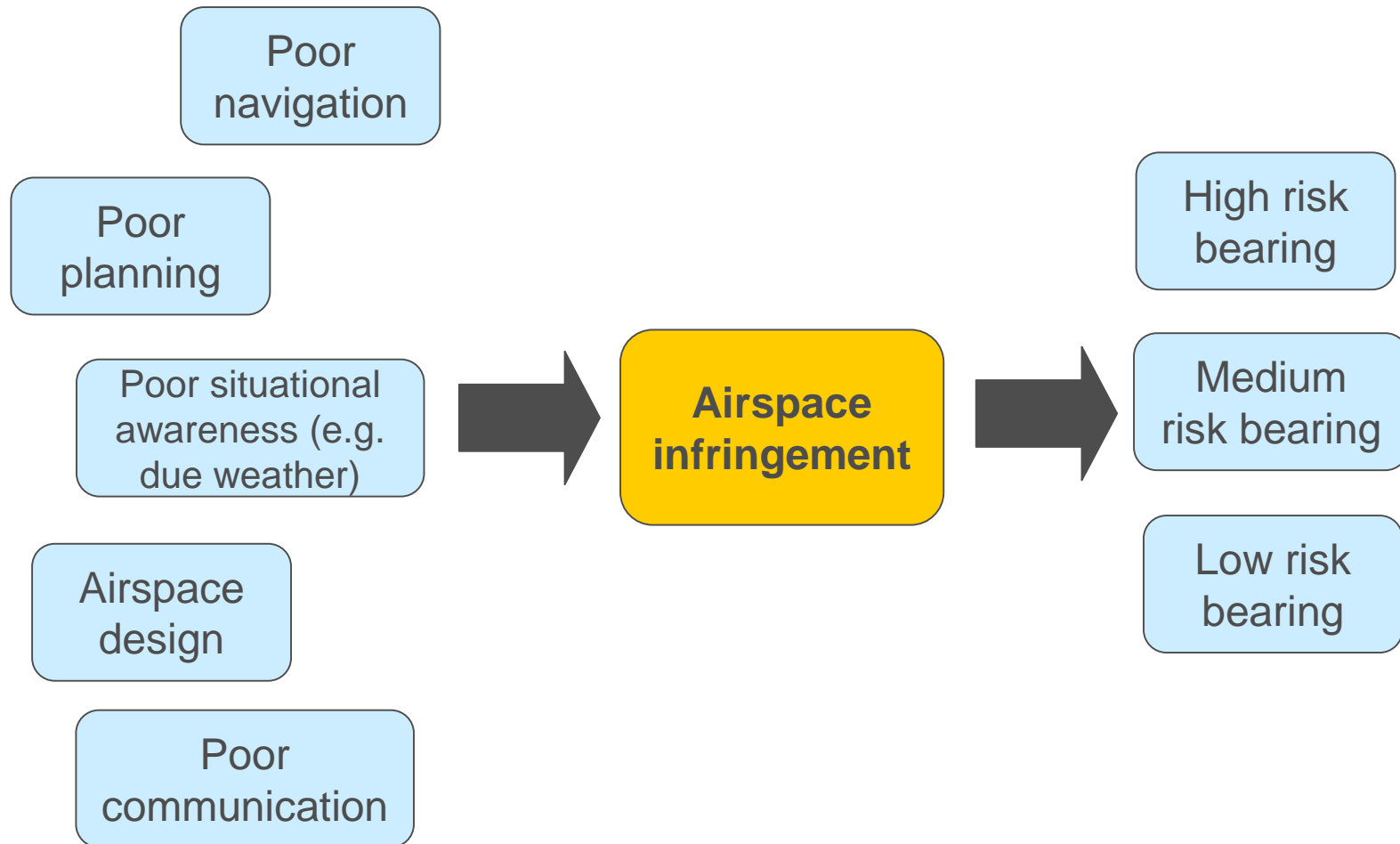
Airspace infringements by GA has been an ongoing safety issue in the UK

- Instances of airspace infringements were on the rise this decade
 - Partly explained by more rigorous monitoring and data collection by NATS and the CAA

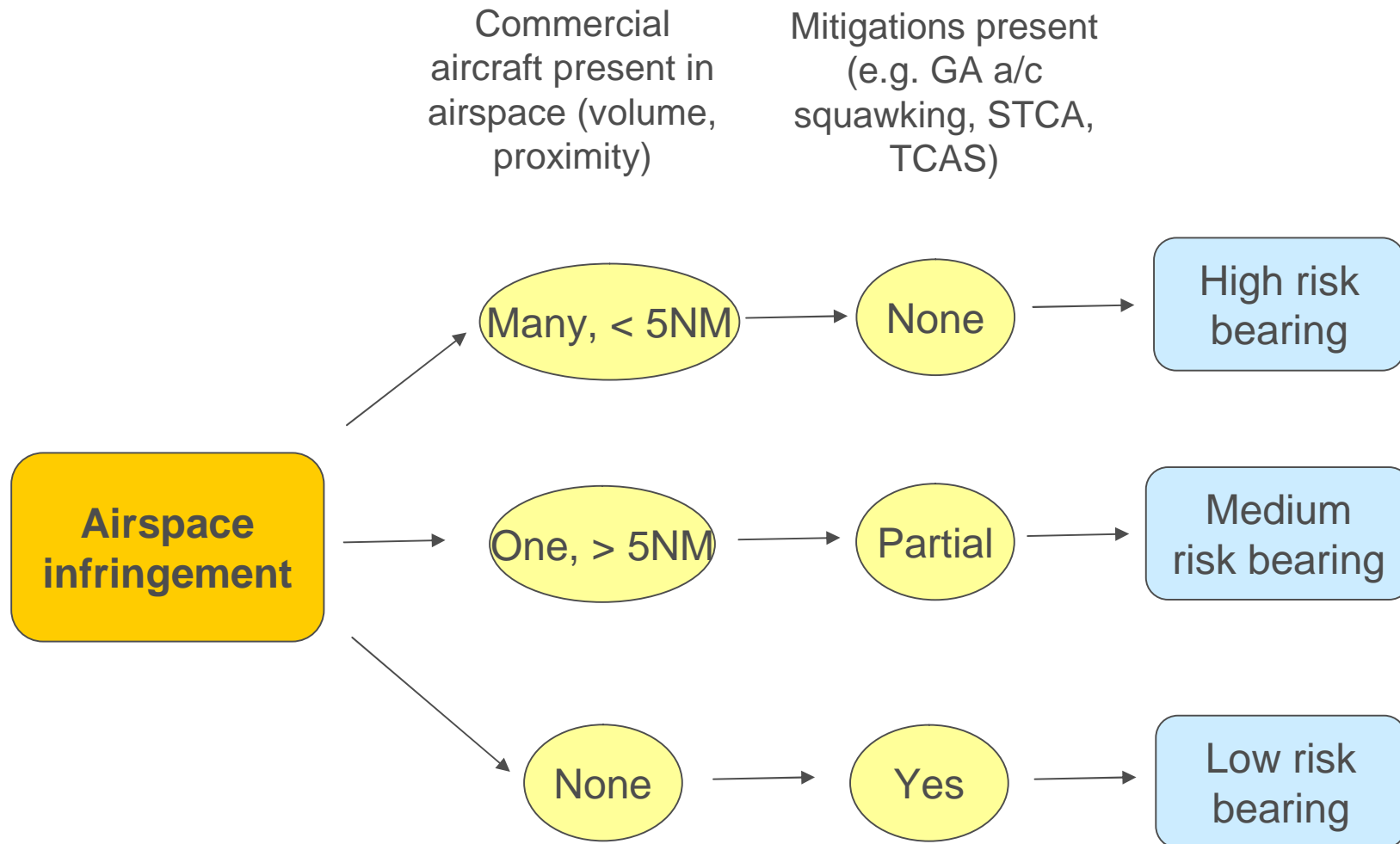
- Initiatives such as On Track (CAA and GA Safety Council GASCo) and other awareness campaigns have reduced the high risk bearing airspace infringements in the last 4 years



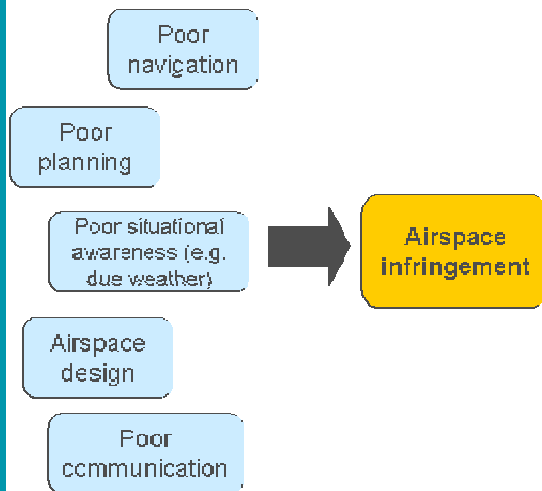
To help focus the issues, let's look at the anatomy of the problem



The effect will depend upon local environment conditions and any safety nets present



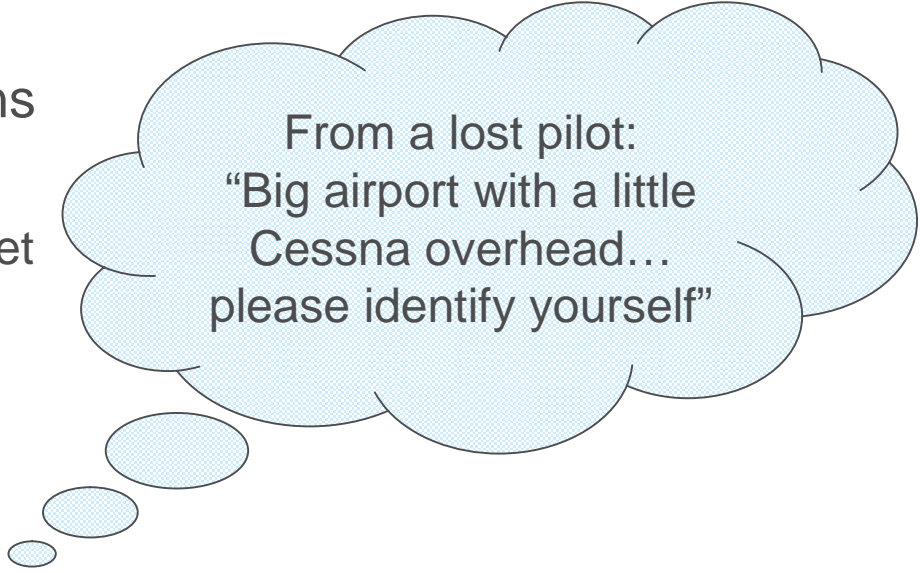
Refocusing on the causes, what can be done to reduce the frequency of any airspace incursion?



1. Training and awareness
2. Proper planning of flights and routes
 - Up to date airspace charts
 - Proper programming of GPS
 - Thorough checking of NOTAMs
3. ATC service present (e.g. Farnborough LARS)
 - Supported by operating transponders
 - Maintains situational awareness
 - Proper clearances

As any good software engineer knows, the issue isn't necessarily how many mitigations you have, but how independent they are

- For example, if the pilot has an “off-day”, many mitigations may be ineffective
 - Transponder not properly set
 - Flight not properly planned
 - Communication poor



From a lost pilot:
“Big airport with a little
Cessna overhead...
please identify yourself”

- These seemingly independent mitigations all have a common factor reducing their success – the pilot
 - We recognise the role of human factors in the controller’s domain (designing tools and training to ensure each controller has a roughly level ability) – what about for the flight crew?
- The safety nets on the ground may be ineffective



The concept of an airborne safety net has been around for decades

- The use of a real-time alerting function is recognised on the ground and in the cockpit
- Very difficult to ignore a warning or alert
- So what about an airborne safety net alerting the flight crew to possible airspace infringements?
 - Independent
 - Stops the hazard before it occurs



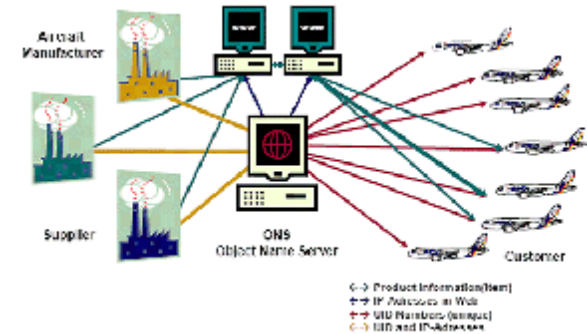
The requirements for such a tool are feasible today

GPS



Could have self powered option (ideally panel mounted)

Near real-time airspace information (AICs, NOTAMs etc)



Alert processing – mapping GPS position to known controlled airspace

There are some issues

1. False alerts

- GA pilots often fly close to controlled airspace (in southern England, we can't avoid it!) – too many false alerts will lead to the system being turned off or ignored

2. Entering accurate airspace information

- Translating from AIP, AICs and NOTAMs into your GPS device through WGS-84 polygons

3. Updating the GPS device

- Easily done during pre-flight planning
- Ideally through a wi-fi connection (mobile technology)
- Would include any daily events (e.g. Red Arrows)

4. Cost!



We have focused on one issue and solution – the ideal is an integrated multi-modal tool

- Airspace infringement is but one safety issue facing GA
- Others are:
 - Airproxs in uncontrolled airspace
 - Controlled Flight Into Terrain
 - Severe weather avoidance
- Not all pilots will want all tools – therefore a multi-modal device could be the solution
 - Economies of scale from common base components
 - Different pricing to suit each user (e.g. gliders may only want air-to-air surveillance)



The cost of safety can be large (NATS recently spent £1m on new LARS) – who should pay?

- There is only so much ground service providers can do
 - The ‘risk’ is now that the only solution remaining is increasing controlled airspace (Class D and above), meaning fewer opportunities for GA to fly in that airspace (at busy times) – e.g. recent Stansted consultations
- A way of ensuring that independent safety nets are incorporated on the flight deck would be an extra mitigation – pilots taking responsibility
- Issues remain with:
 - Pricing (appropriate, proportionate, cost-effective)
 - Subsidisation (analogies drawn with other safety initiatives)
 - Benefits (need to show efficiency benefits as well as safety)





HELIOS

Thank you for your attention

Ben Stanley

www.askhelios.com

ben.stanley@askhelios.com

