canso
civil air navigation services organisation

Global Air Traffic Management and Space Traffic

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TRANSFORMING
GLOBAL ATM PERFORMANCE

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Topics

- CANSO
- Committees
- From 100km - Space
- From FL600 - 100km
- Integration
- Risk for aviation due to space operations
- Conclusion

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civil air navigation services organisation

Civil Air Navigation Services Organisation (CANSO)

- Global voice of ATM worldwide – CANSO Members support over 85% of world air traffic
- 87 Full and 81 Associate Members
- Members share information and develop new policies
- International forum for development and exchange of ideas
- International network for ANS experts
- Represent views/interests of Members

CANSO Standing Committees

Safety Standing Committee
(SSC)

Operations Standing Committee
(OSC)

Strategy and Integration Standing Committee
(SISC)

From 100km - Space

- Space is getting busier then ever.
  - Growing 5-8% annually
    - Over 80 launches a year
    - 1400 satellites in operation
    - SpaceX and OneWeb building mega constellations of satellites
    - Airbus Spaceplane; SNC Dream Chaser
    - Space tourism: Virgin Galactic, Blue Origin, SpaceX Dragon2, XCOR.

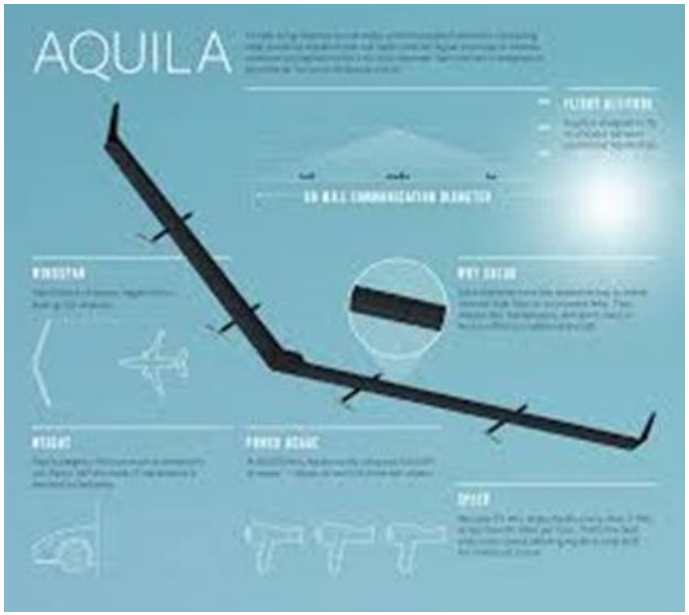
Commercial Space

Commercial Space

From FL600 - 100km

Project Loon's balloons

Facebook's Aquila solar powered aircraft



Integration

- Clear rules need to be developed and agreed by all stakeholders, to accommodate the requirements of users in traditional airspace, as well as space-bound vehicles travelling to and from space.

Integration 2

- Close cooperation and collaboration with organisations responsible for space traffic management (STM), airspace/space users and ATM; and the global regulators, including ICAO and the United Nations Office for Outer Space Affairs.

Integration 3

- Consider together how to integrate commercial space operations into the ATM system, minimising the impact of space vehicles on air traffic, while maintaining a high level of safety.
- This may require the modification of ATM software and training of ATCOs.

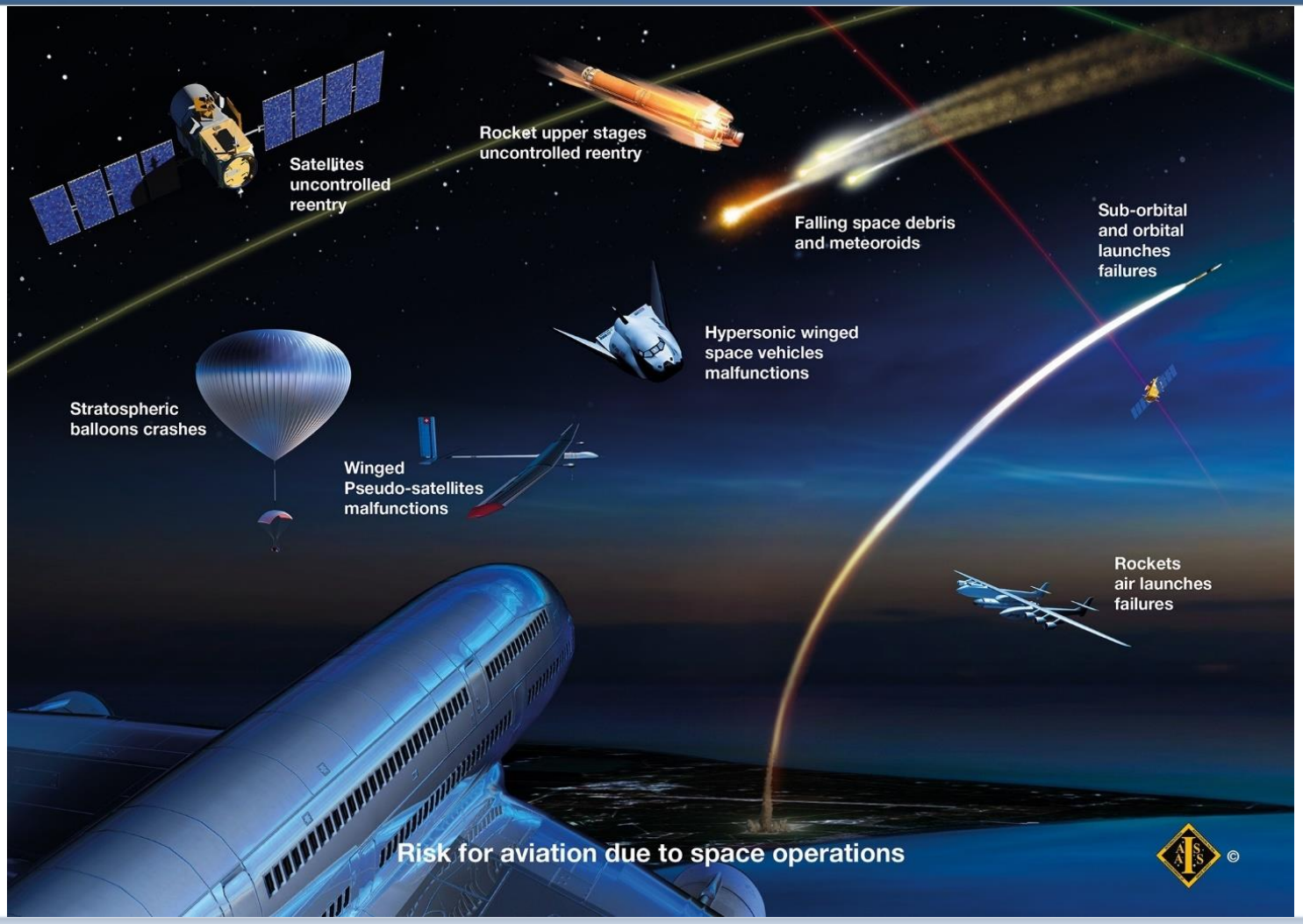
Integration 4

- New separation standards may be required based on new types of aircraft, their equipment, surveillance, performance, communications, navigation, etc.
- Contingency planning should include unforeseen re-entry on the whole flight track of the vehicle

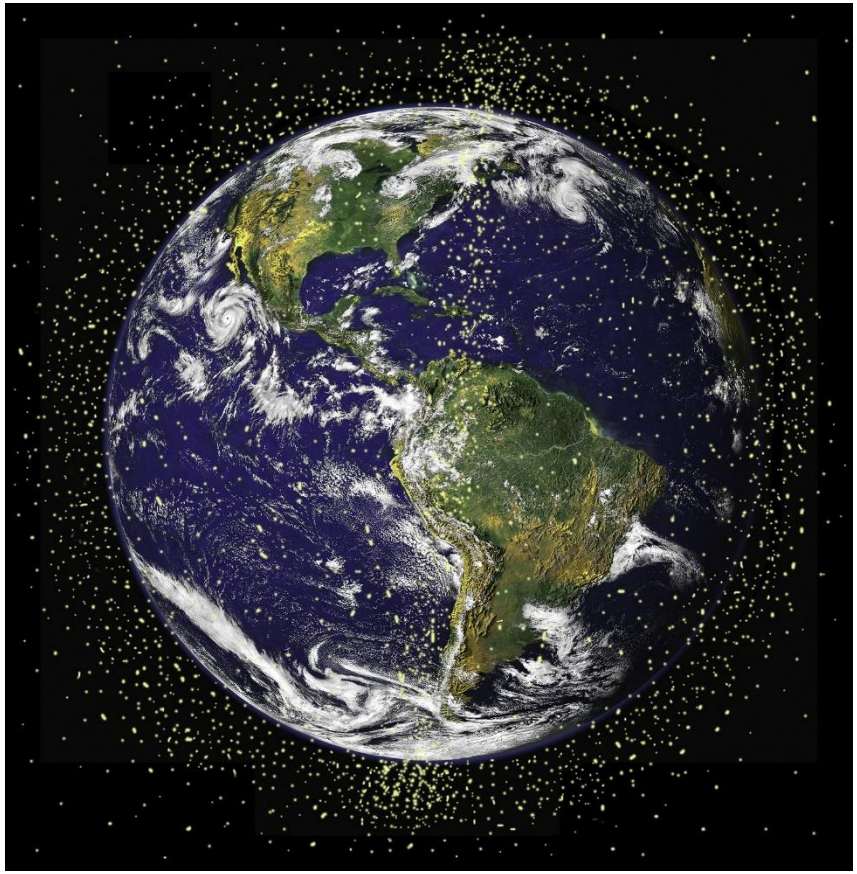
Risk for aviation due to space operations

- Satellites uncontrolled entries
- Stratospheric balloon crashes
- Winged pseudo-satellites malfunctions
- Rocket upper stages uncontrolled re-entry
- Falling space debris
- Space vehicle malfunctions
- Air-launches failures
- Sub-orbital and orbital launch failures.

Risk for aviation due to space operations

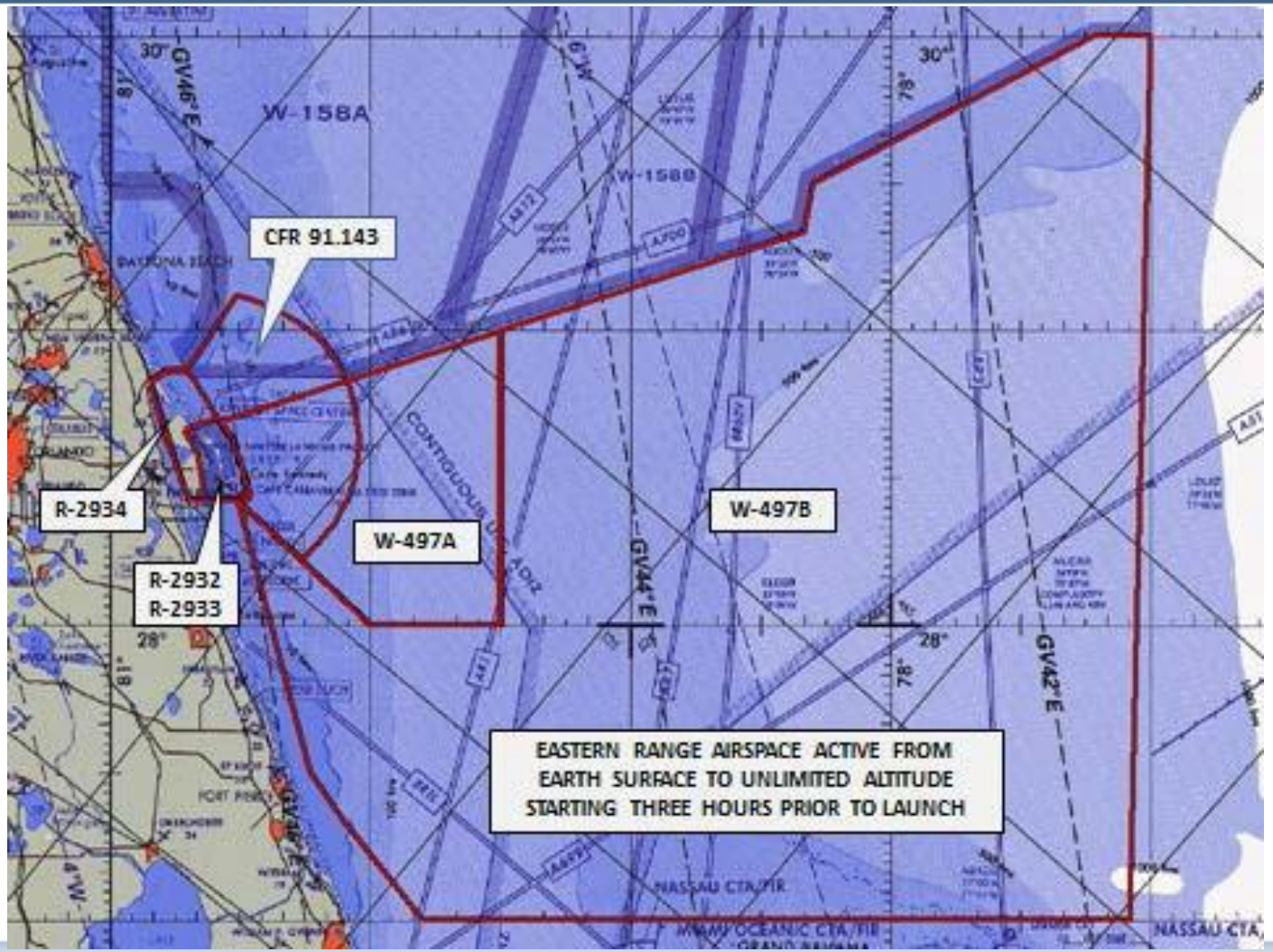


- **NASA**: 1 piece falls back to Earth each day.
- **2% to 5%** — estimated annual increase in the amount of space junk orbiting Earth.
- **22,000** — pieces of space debris measuring 10 centimetres or more in diameter in 2011



Space port

Airspace closures



Conclusion

- Fast growing industry with great potential
- Regulations need to be made to include space operations
- Cooperation between STM and ATM is paramount
- Training ATCOs
- New separation standards?
- Contingency procedures!

Thank you!

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