AVIATION SAFETY ANALYSIS AND GIS

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Safety Intelligence Objectives

- Create **actionable information** for use by decision makers in defining **aviation safety strategies**
- Identify targeted **areas of current and emerging risk** and develop specific alternatives to be considered for effective mitigation
Safety Intelligence Frameworks

- Accident, traffic, fleet and USOAP Audit Data
- Integrated safety analysis results

- Georeferenced Data visualization maps
- Routes, traffic and airspace maps

http://www.icao.int/safety
http://gis.icao.int
Accident Risk Model

Modifiable Areal Unit Problem (MAUP)

Evaluating Risk
Modifiable Areal Unit Problem

Standard Deviation of Unitary Change in Accident rate can used to measure MAUP for a given grouping.
Evaluating Risk

1. Visualize the hazard (volume) by areal unit

2. Overlay the corresponding defense/mitigation (level of implementation of ICAO standard, USOAP)

3. Identify areas of strong hazards with week defenses
Evaluating Risk

Loss of separation

Hazard=Flights  Areal Unit = Flight Information Region (FIR)

Defense/mitigation overlay: State to ensure that separation minima are applied
Evaluating Risk

Handover and coordination between States

Hazard=Flights  Areal Unit =State Airspace Boundaries

Traffic across State FIR Boundaries

Defense/mitigation overlay:
States ensure proper coordination between ATS units

Traffic across State FIR Boundaries (2010)
What next

• Expand iSTARS to include spatial analysis tools
• Integrate analytical terrain and weather related hazard data
• Simulate terrain
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