



INTERNATIONAL CIVIL AVIATION ORGANIZATION

A United Nations Specialized Agency

Safety Intelligence through iSTARS

Marco Merens

Technical Officer, Air Navigation Bureau, ICAO

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 Self-assessment



- Who am I?
- What are my problems?
- What are my priorities?
- Who can help me?



Safety Intelligence Frameworks



<http://www.icao.int/safety/istars>

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



<http://gis.icao.int>

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

Accident Risk Model



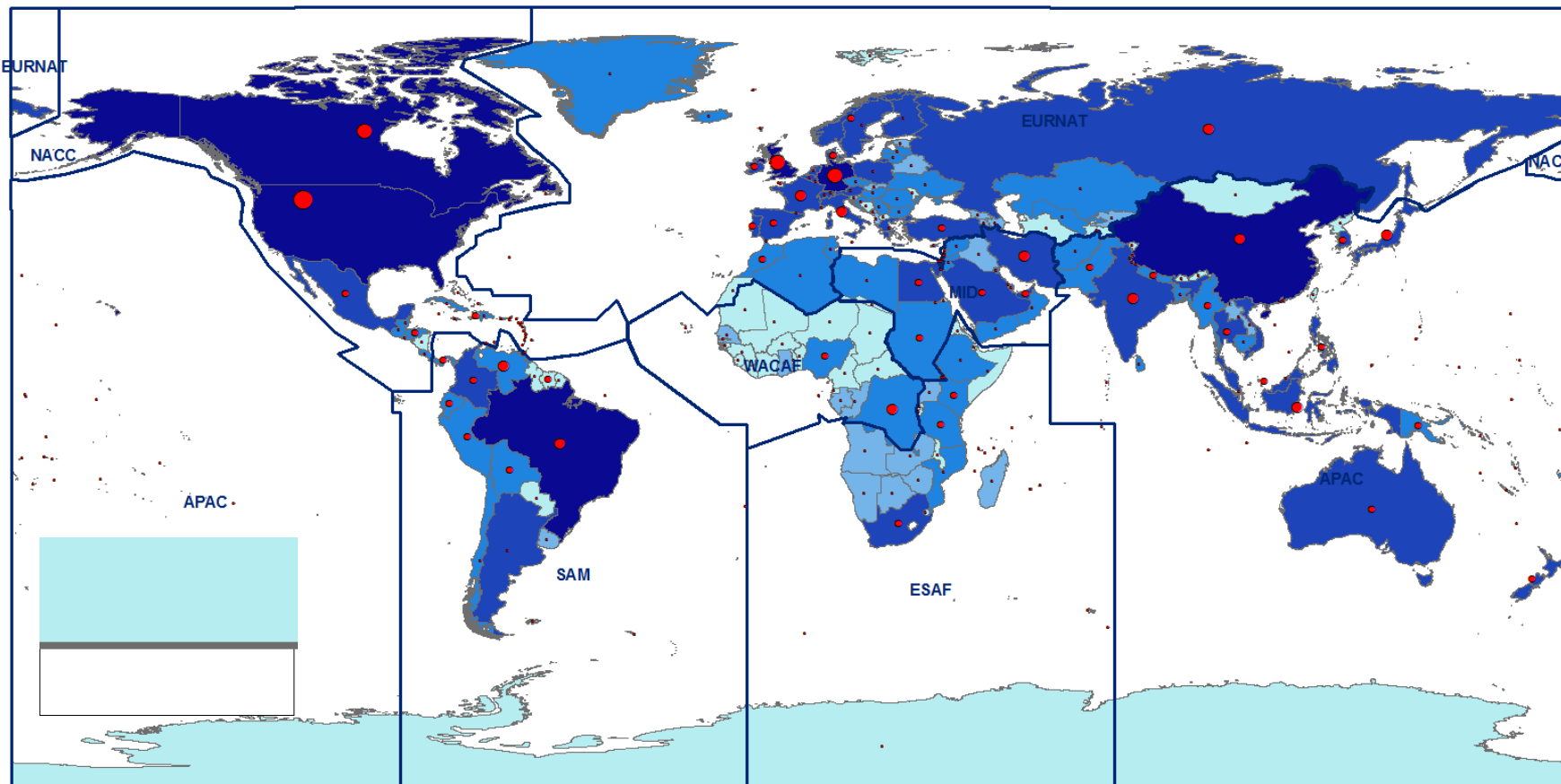
$$Accidents_{unit,year} \sim \text{Poisson} (AccidentRisk * Departures)$$

$$\text{Log}(AccidentRisk) = \text{LinComb}(Hazards) - \text{LinComb}(Defenses) + Cst$$



$$AccidentRate = \text{Empirical } AccidentRisk_{unit,year} = \frac{Accidents}{Departures}$$

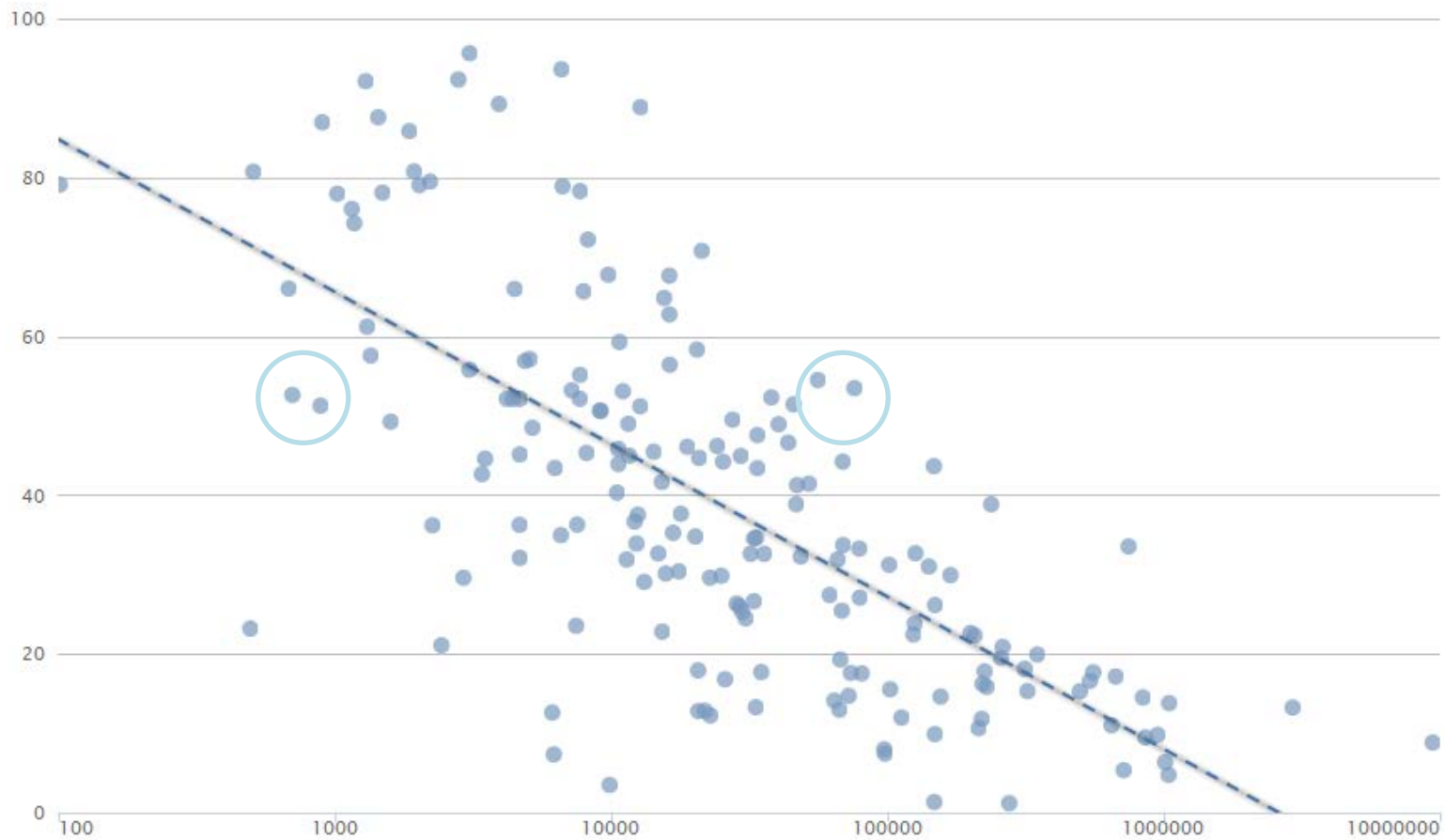
Accidents and Departures



Risk analysis



Level of implementation of Defenses



Exposure

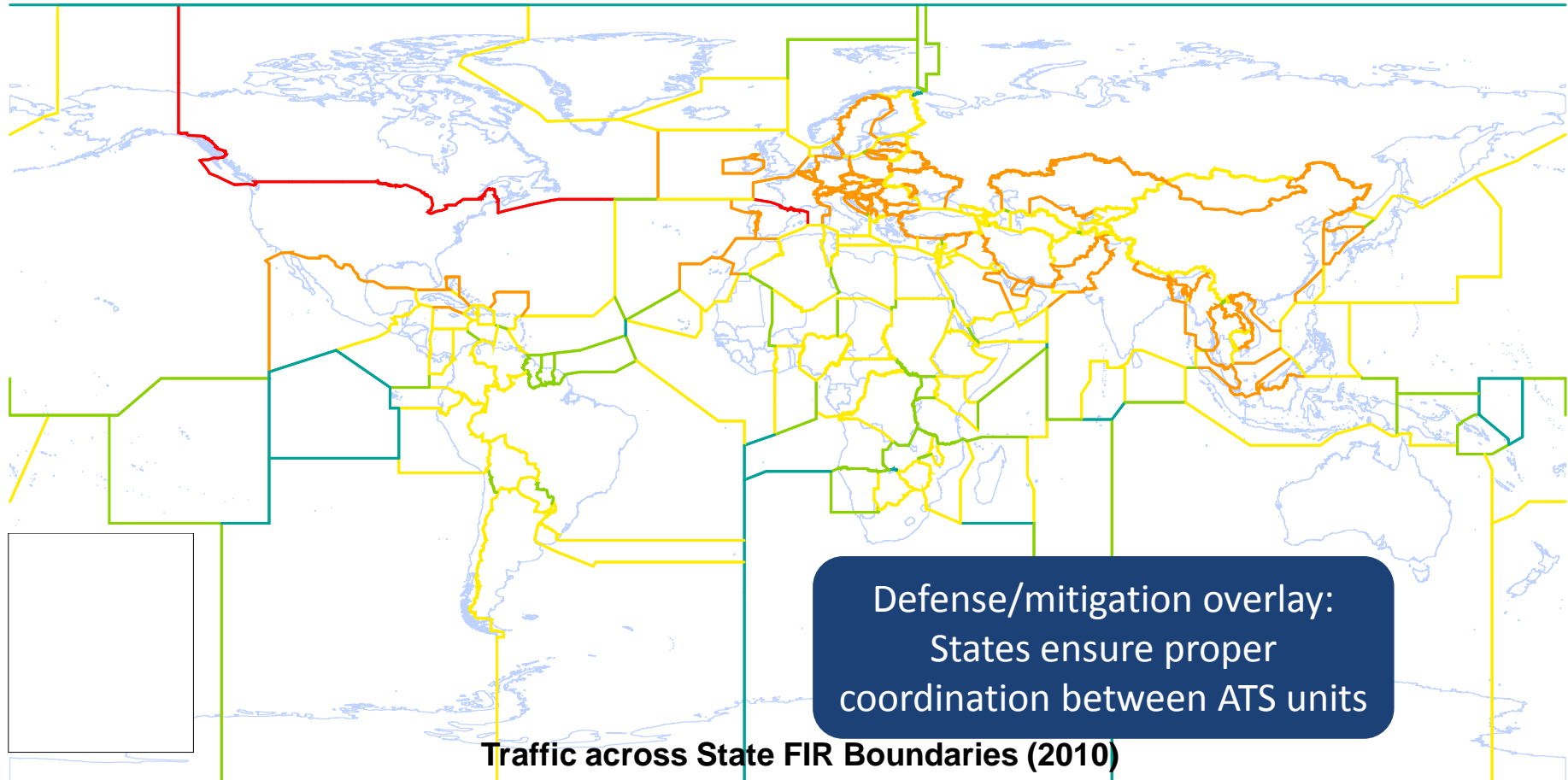
Evaluating Risk

Handover and coordination between States

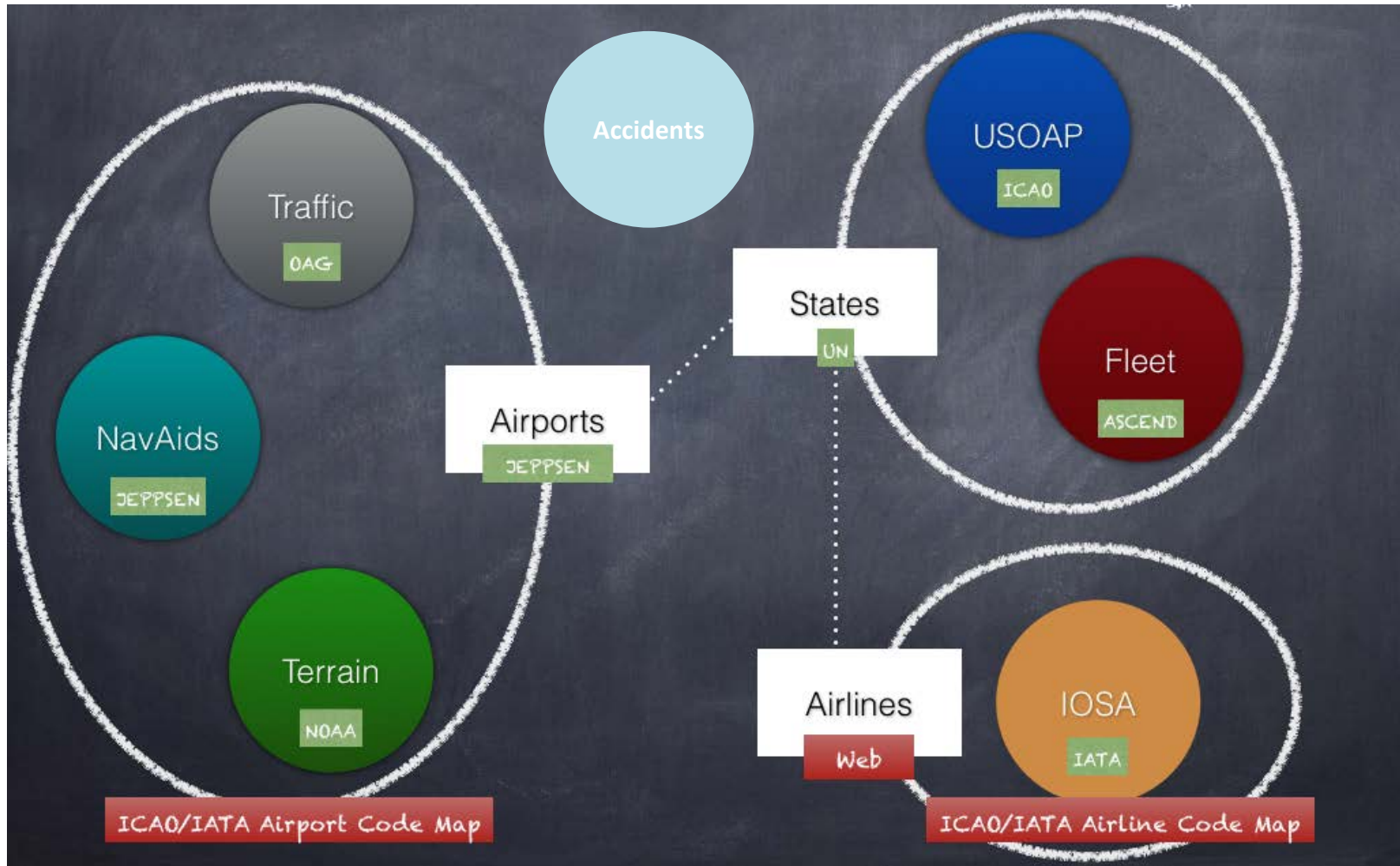


Hazard=Flights

Areal Unit =State Airspace Boundaries

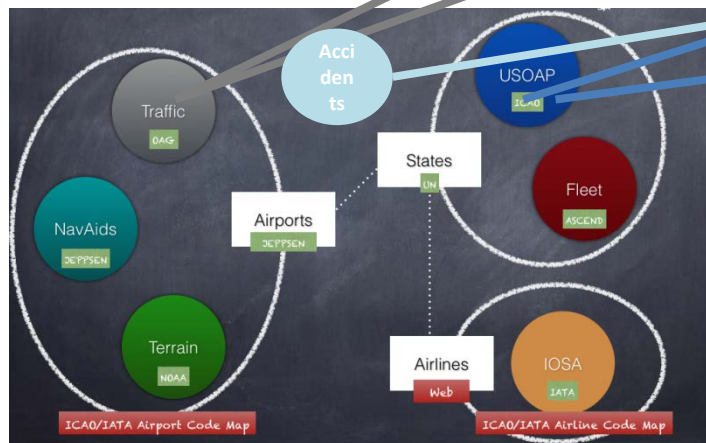


iSTARS Data

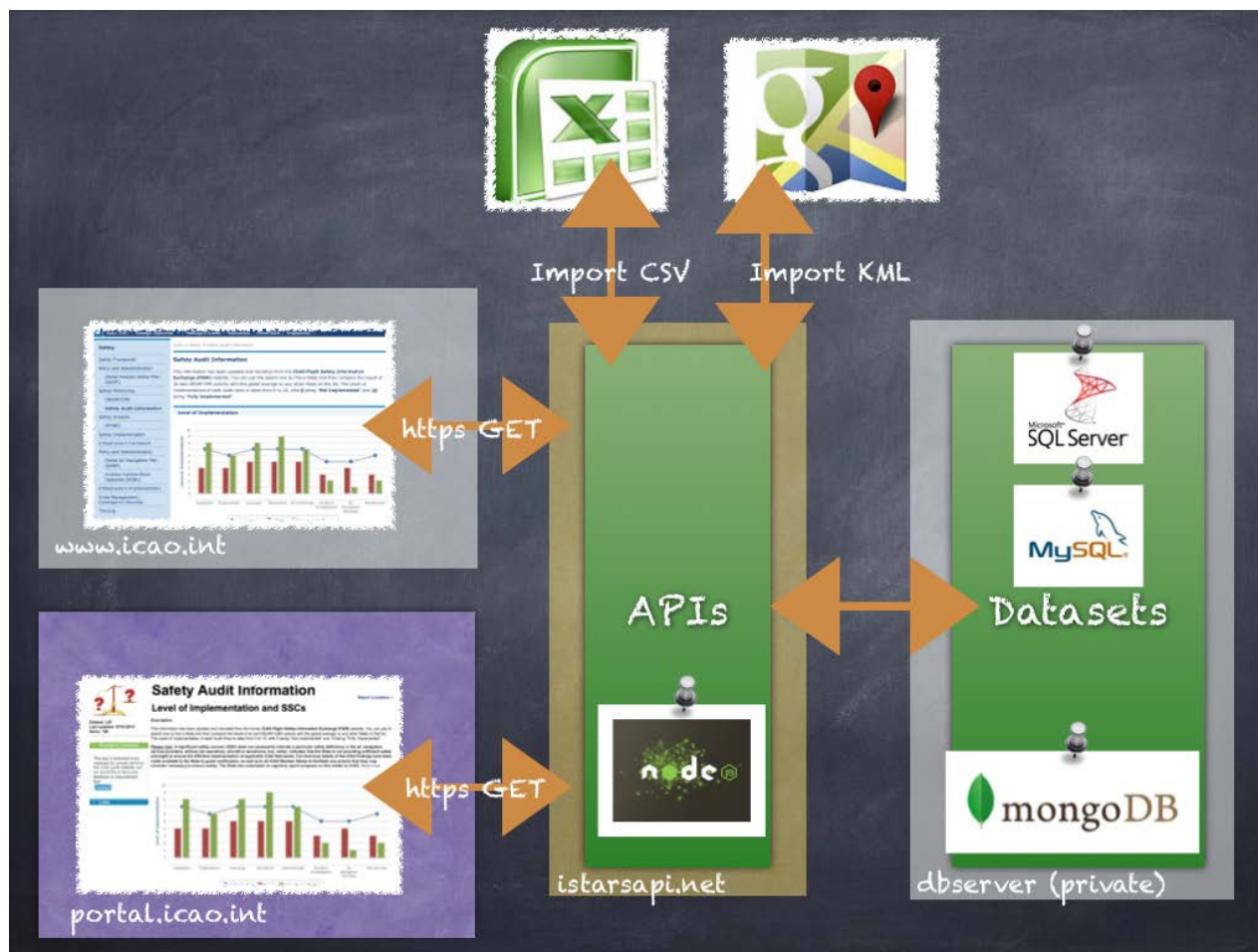


Risk Profiling

- Identify Key Indicators
- Define charts
- Build a message



Safety Analysis Framework



What next



- Expand iSTARS to include terrain and weather related hazard data
- Include real-time data
- Connect ORP and HIRM

ICAO

Uniting Aviation on

Safety | Security | Environment

