# In-Time Aviation Safety Management Systems Overview



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# Innovating the Future of Aviation

## Human-Centric Capabilities

**Safety + Density**

Human centered traffic &
Safety management



## Digitally Transformed Infrastructure

**Collaborative Environment**

Service oriented architecture
for tailored mission services
+ ML
+ IoT

## Automation-Enabled Diversity

**Highly Automated**

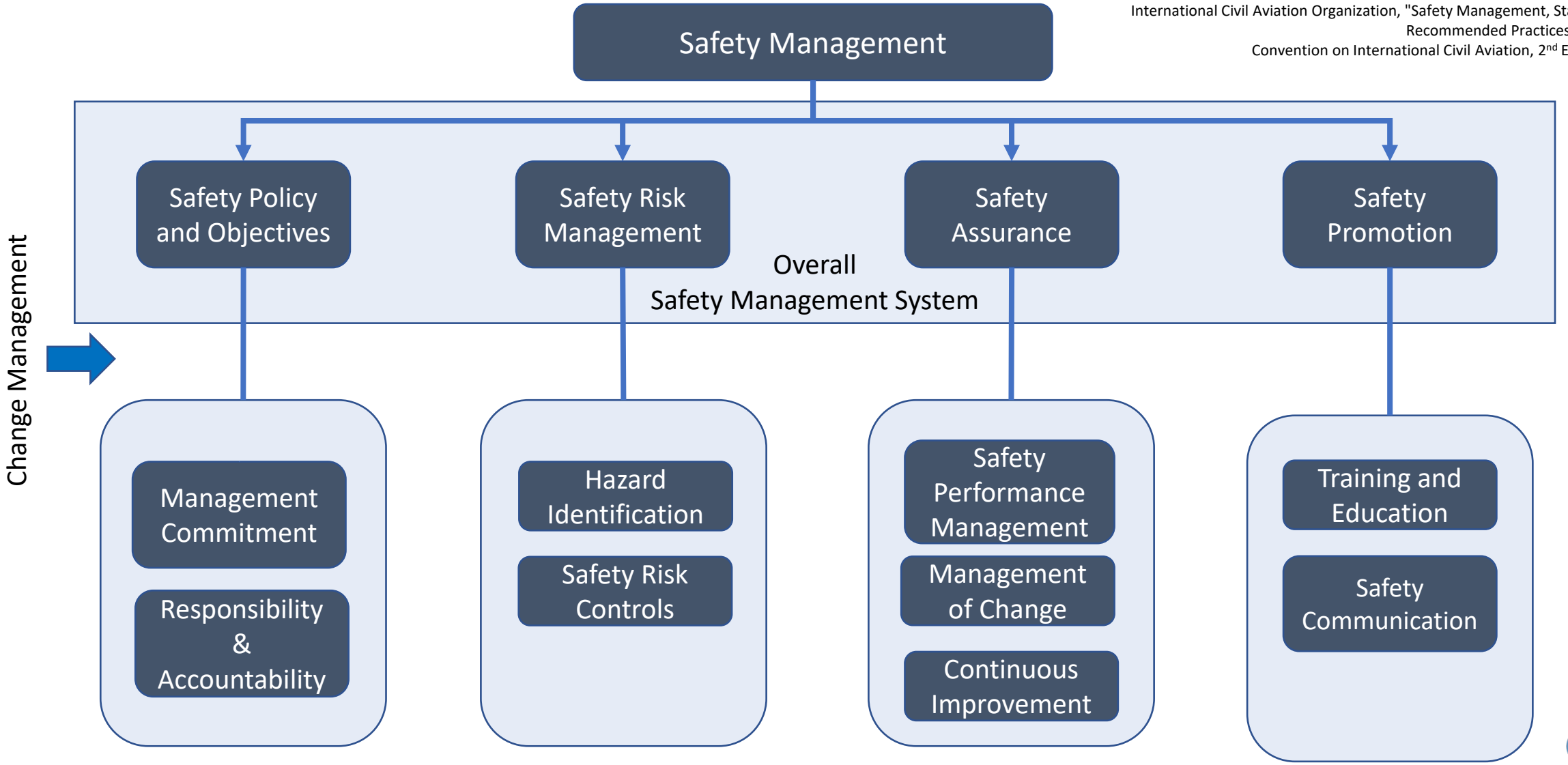
Complexity, scalability,
And dynamic adaptation
+ digital mesh
+ AI
+ IoT



Evolution of Airspace Operations and Safety

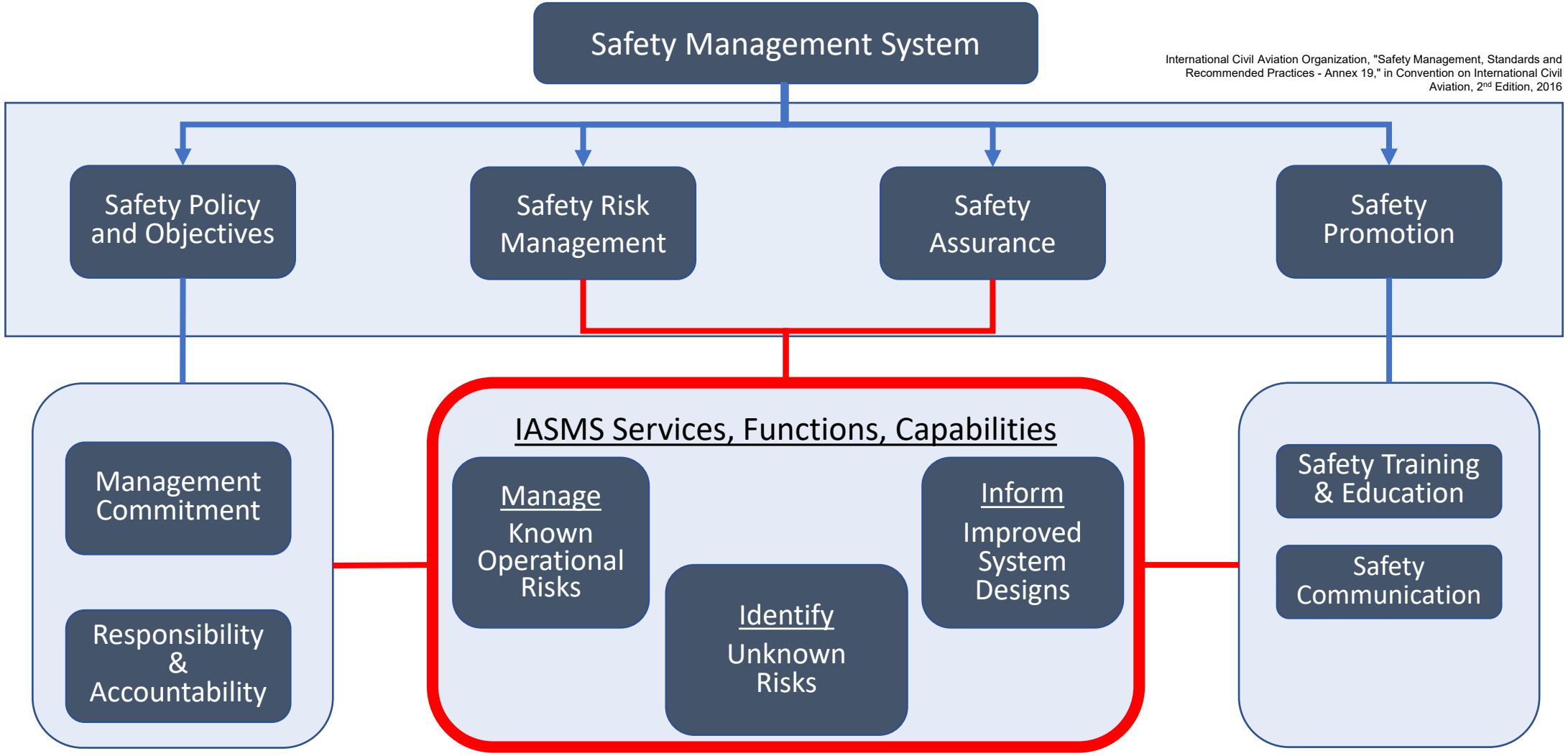
# How We Achieve Aviation Safety Today

International Civil Aviation Organization, "Safety Management, Standards and Recommended Practices - Annex 19, Convention on International Civil Aviation, 2nd Edition, 2016




System-Wide Safety

# How We Achieve Aviation Safety Tomorrow



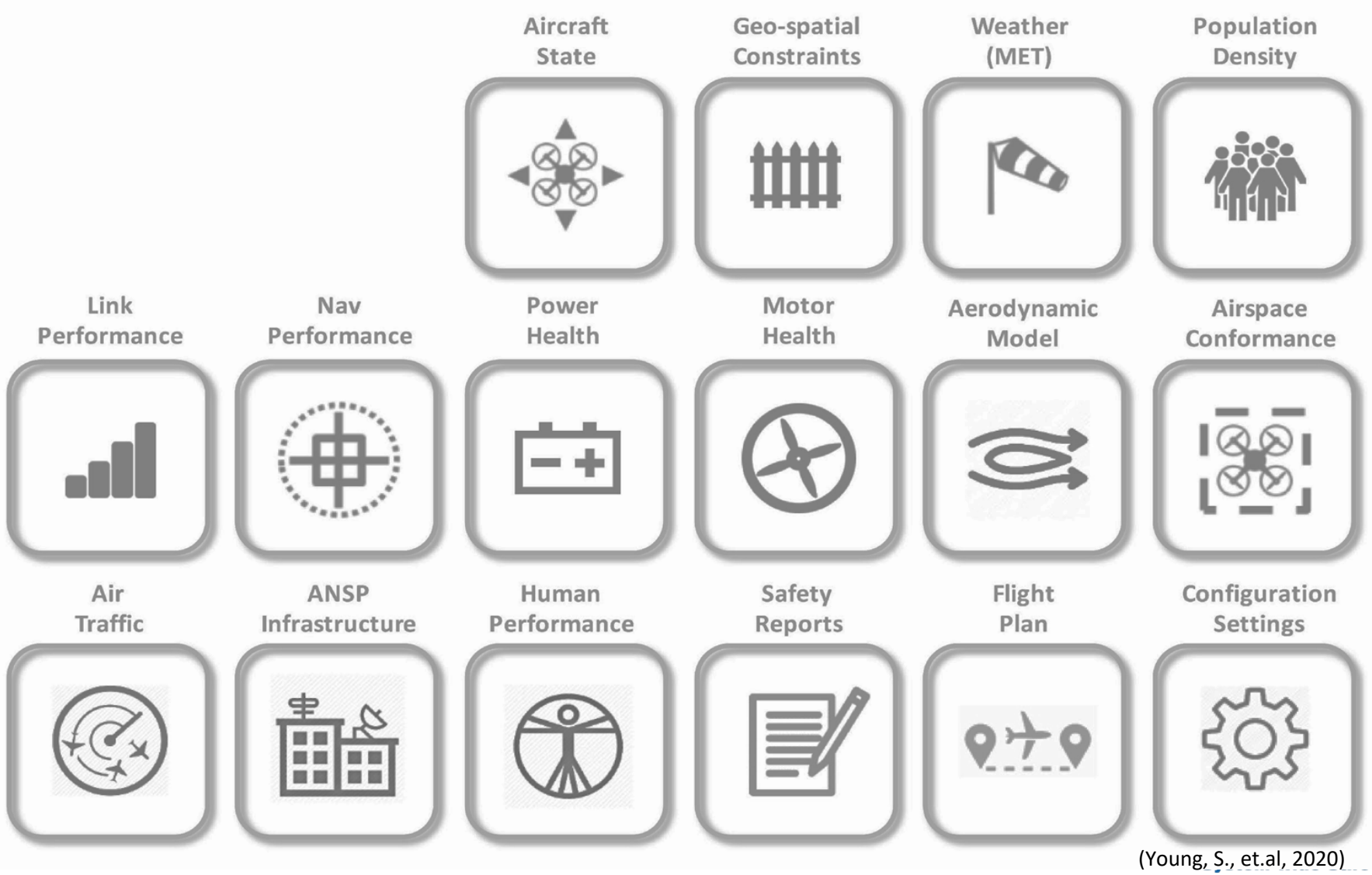

***Quickly manage known operational risks at scale***
***Quickly identify unknown risks***
***Quickly inform design***

System-Wide Safety

# It All Starts with Data…

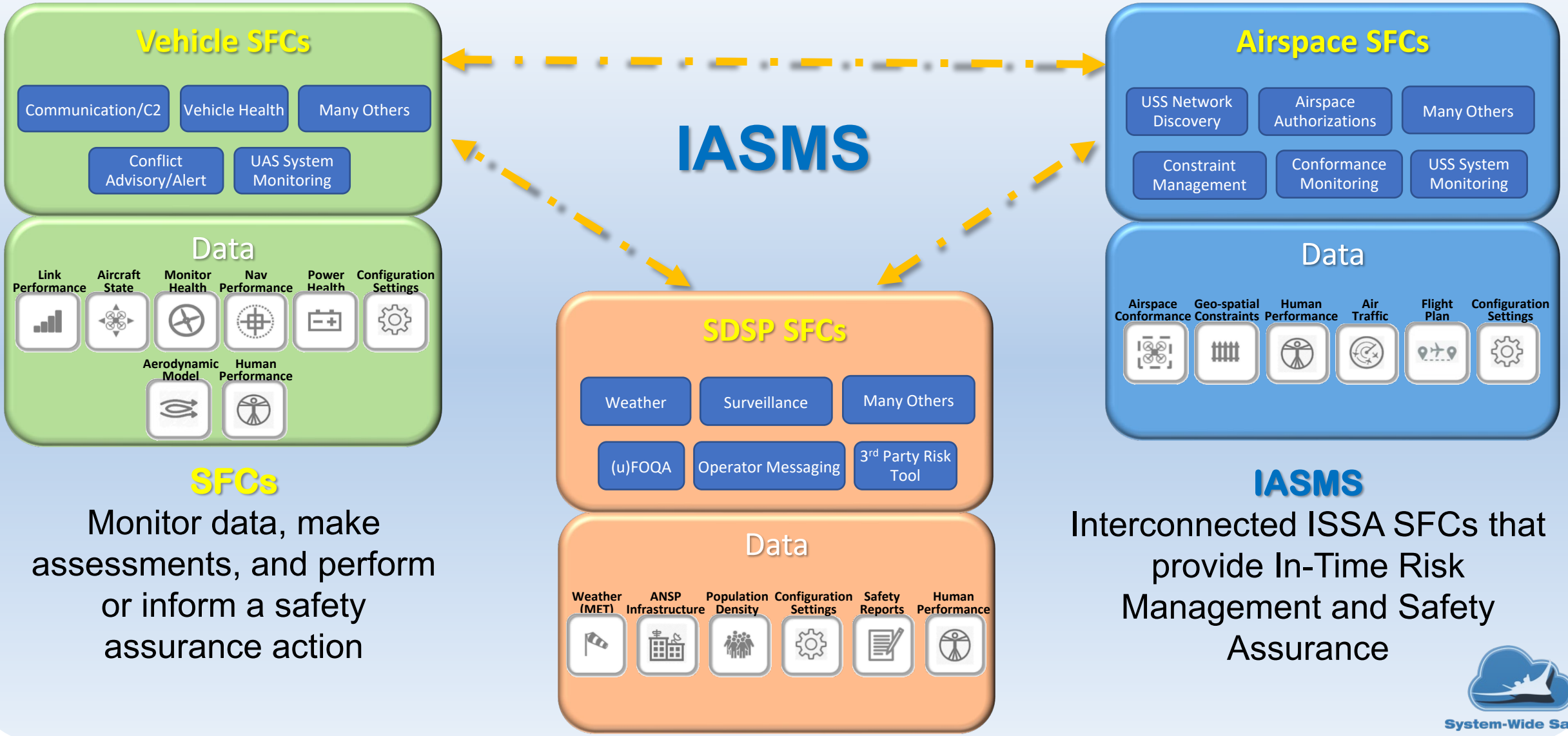
**Information classes useful to enable IASMS**

- Airspace Sourced
- Vehicle Sourced
- Supplemental Data Service Provider (SDSP) Sourced
- System Wide Information Management (SWIM) / Flight Information Management System (FIMS) Sourced
- Other Sources…




(Young, S., et.al, 2020)

# Service-Oriented Architecture




**SFCs**

Monitor data, make assessments, and perform or inform a safety assurance action

**IASMS**

Interconnected ISSA SFCs that provide In-Time Risk Management and Safety Assurance

System-Wide Safety

# Sample Vertiport Hazards and Characteristics

| Hazard Category | Main Components | Potential Consequences |
|---|---|---|
| Taxiway routings | Traffic control, weather conditions, communication, marking | • Routing errors with aircraft and vehicle collisions<br>• Runway incursions |
| Adverse environmental conditions (night, low visibility, adverse wind conditions, precipitation) | Training and experience for adverse weather conditions, preparation and communication, visibility and lighting conditions, runway surface conditions, approach conditions | • Aircraft and ground vehicle collisions<br>• Aircraft and vehicles running over airport workers and passengers<br>• Aircraft overruns, veer-offs, and undershoots |
| Wildlife hazards (birds and other wildlife) | Fencing, wildlife detection systems and procedures, deterrent devices, wildlife management plan, training and equipment for wildlife control, minimization of attractants (through disposal of food and airport trash, garbage receptacles, and airport zoning) | • Bird and wildlife strikes to aircraft and vehicles<br>• Loss of aircraft and vehicle control |
| Visual and non-visual aids for approach and landing | Adequacy and reliability, interference, runway approach area updates | • Inaccurate approach and landing<br>• Unavailability of NAVAIDS<br>• Collision with obstacles<br>• Aircraft overruns and undershoots |
| Obstacles | Signage, monitoring, awareness of pilots, and air traffic control | • Aircraft collision with obstacles<br>• Vehicle and equipment collisions |