



Australian Government
Civil Aviation Safety Authority

ICAO Asia Pacific

Wildlife Hazard Management Working Group
(WHM WG/6)

Workshop 2024

Hazards, Threats, Risks and Controls – *a different perspective for the future*

May 2024

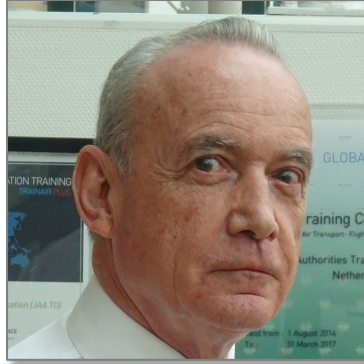


International WHM SME Group

RA sub-working Group:



ATM SME



PILOT



ANSP



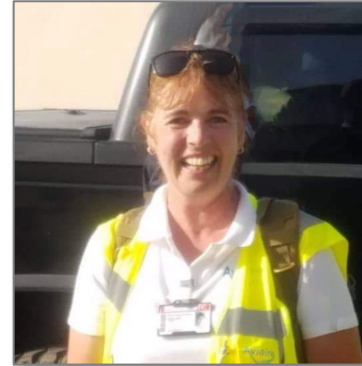
REGULATOR



WHM SME



WHM SME



WHM SME



WHM SME





... plus ...

*other government
considerations ...*

... plus ...

...community...

... plus ...

... plus ...

... plus ...



... a non-WHM example...

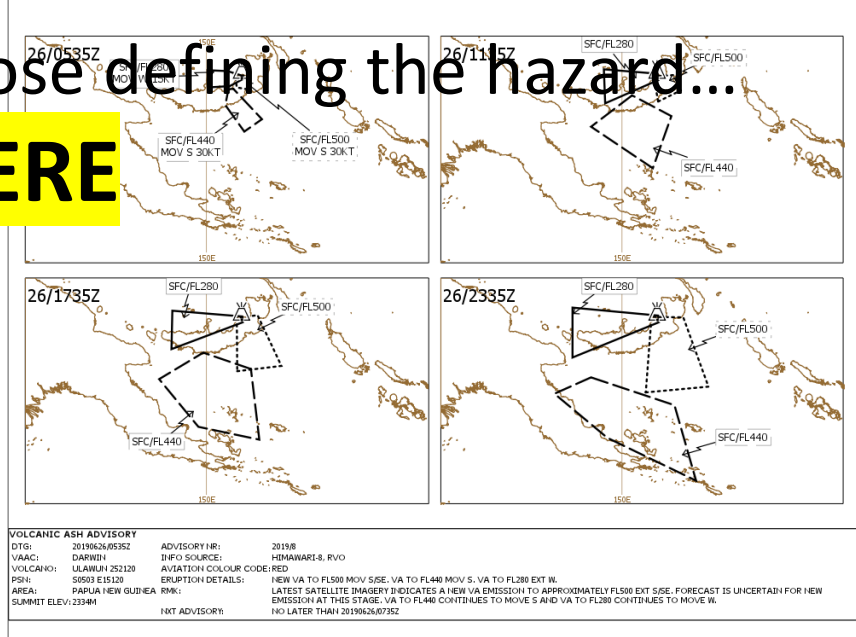
TAF AMD WIII 020328Z 0203/0306 01010KT 9999 -SHRA SCT030
FM020400 25014KT 9999 -SHRA SCT030
FM030300 28020G30KT 9999 -SHRA SCT025
INTER 0203/0208 25015G25KT 4000 SHRA SCT015
INTER 0208/0212 25015G25KT 6000 SHRA SCT020
INTER 0304/0306 28025G35KT 4000 SHRA BKN015



AREA: PAPUA NEW GUINEA
SUMMIT ELEV: 2334M
ADVISORY NR: 2019/9
INFO SOURCE: HIMAWARI-8, RVO
AVIATION COLOUR CODE: RED
ERUPTION DETAILS: NEW VA TO FL500 MOV S/S.E. VA TO FL400 MOV
S. VA TO FL280 EXT W.

the word **risk** is not used by those defining the hazard...

ANYWHERE



SFC/FL280 S0508 E15123 - S0455

... we need to re-balance the risk equation...



Our Aim:

A repeatable process, anyone can follow, to establish the aviation safety risk, caused by wildlife

		PROBABILITY				
		Very High	High	Moderate	Low	Very Low
SEVERITY	Very High					
	High					
	Moderate					
	Low					
	Very Low					

The challenge for everyone

3.4.3 The three risk levels are defined as follows and should be the main focus when interpreting the risk matrix:

Level 1 (Green) — *Acceptable*. The risk is acceptable as it is. No further action is required.

Level 2 (Yellow) — *Tolerable*. The risk can be tolerated based on the safety risk mitigation. Review current action undertaken, identify possible further action.

Level 3 (Red) — *Intolerable*. Take immediate action. Further action is required to reduce the risk.

safety risk = (probability of a strike) × (severity of damage caused)

... the **other** challenge for *some*



... so, what's the problem ?



...well, we are not balanced ...



Aviation Safety Risk

ICAO Doc 9137



- a) a hazard is a condition or object with the potential to cause or contribute to an aircraft incident or accident. ✓

In our context, a hazard is the presence of certain wildlife on or near an aerodrome; and

- b) a safety risk is the predicted probability and severity of the consequences or outcomes of a hazard. ✓

In our context, safety risk is the probability of a wildlife strike involving a particular species multiplied by the severity of damage to the aircraft that might reasonably occur. ✗

safety risk = (probability of a strike) × (severity of damage caused)

... *why*...



Aviation Safety *Risk* (cont'd)

PANS AD 2.0: The risk assessment takes into account the **probability of occurrence of a hazard** and the severity of its consequences; the risk is evaluated by combining the two values for severity and probability of occurrence.

... *but*...

PANS AD 3.4.4.1: This risk assessment will determine the severity of a consequence (effect on the safety of the considered operations) and the **probability of the consequence occurring** and will be based on experience as well as on any available data (e.g. accident database, occurrence reports).

... so is it strike or occurrence of hazard or the consequence...



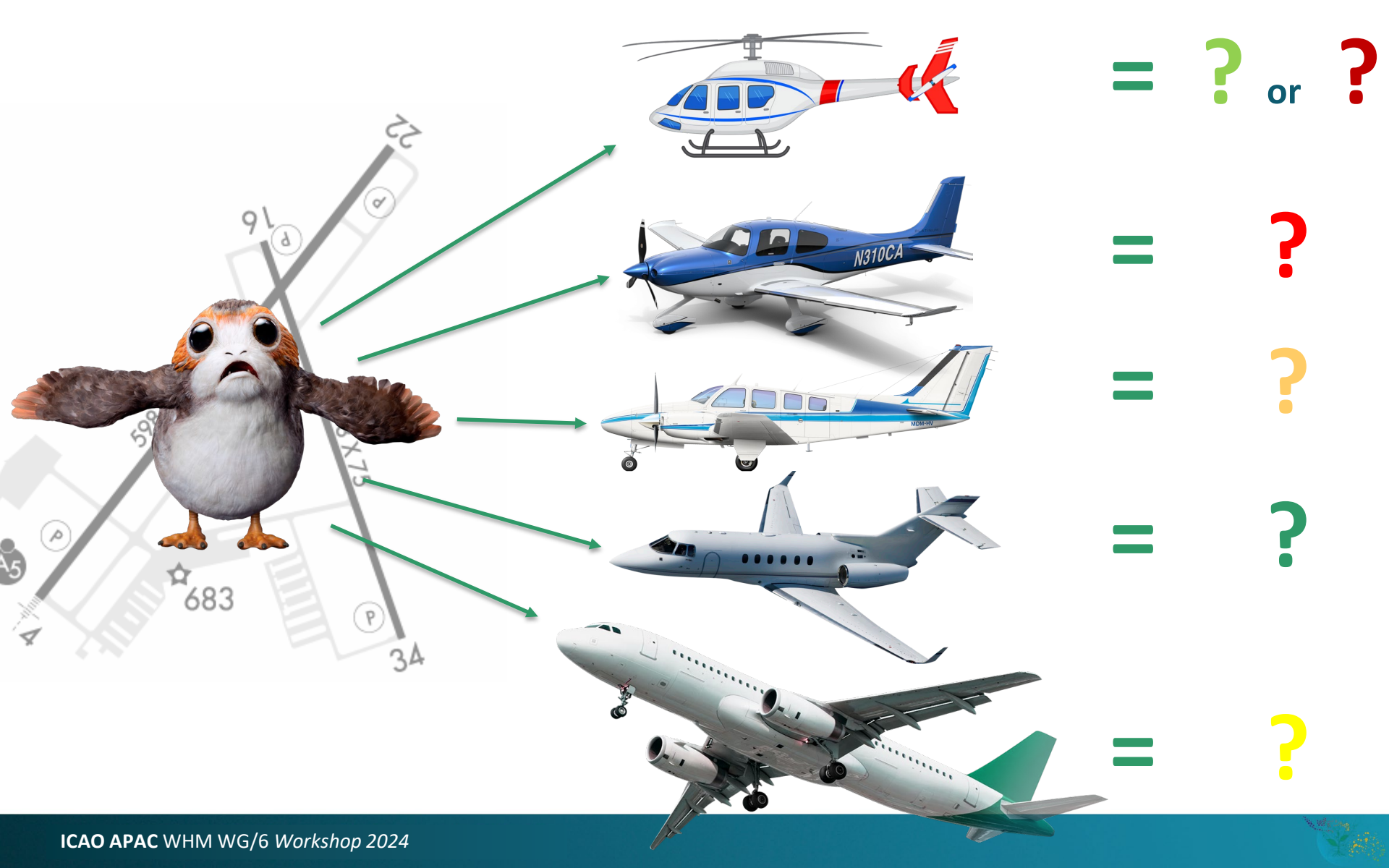
Aviation Safety Risk (cont'd)

SMM: Safety risk probability is the likelihood that a safety consequence or outcome will occur.

Once the probability assessment has been completed, the next step is to assess the severity, taking into account the potential consequences related to the hazard. Safety risk severity is defined as the **extent of harm** that might reasonably be expected to occur as a consequence or outcome of the identified hazard.

... but even if we get airports language and process consistent; the outcome will have little effect - as the consequence for the same hazard can be different risks for differing aircraft ...





What is the risk and who owns it ?

risk

UK/ di: '/risk/US/ di: '/risk/

noun / verb

1. *The predicted consequences or outcomes of a hazard; often expressed as a probability of that consequence and severity of the realization of the hazard*



Risk owner A person or entity with the accountability and authority to manage a risk.
Where the '*control owner*' and the '*treatment owner*' are different, the risk owner has accountability to ensure that the treatment plan is implemented.

(source: various business/risk/security)



Risk Assessment - What Is Needed?

Risk needs to be assessed by appropriate persons

- in a simplified, repeatable way
- using verified, quantitative data, and
- by using affordable resources and equipment.

Acknowledge that
'damage severity rating'
is **different** for
every type of aircraft and *each* different species



Risk Matrix Comparison

Table 3. Example safety risk matrix

Safety Risk		Severity				
		Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
Frequent	5	5A	5B	5C	5D	5E
Occasional	4	4A	4B	4C	4D	4E
Remote	3	3A	3B	3C	3D	3E
Improbable	2	2A	2B	2C	2D	2E
Extremely improbable	1	1A	1B	1C	1D	1E

Note.— In determining the safety risk tolerability, the quality and reliability of the data used for the hazard identification and safety risk probability should be taken into consideration.

Safety Management Manual

Table 3-8. Example of risk assessment matrix categorizing analysed species

		PROBABILITY				
		Very high	High	Moderate	Low	Very low
SEVERITY	Very High		Griffon vulture			
	High					
	Moderate		Common kestrel			
	Low					
	Very Low		Barn swallow			

Airport Services Manual



Safety Risk-Management Decision Aid

(from ICAO Doc 9859 SMM)

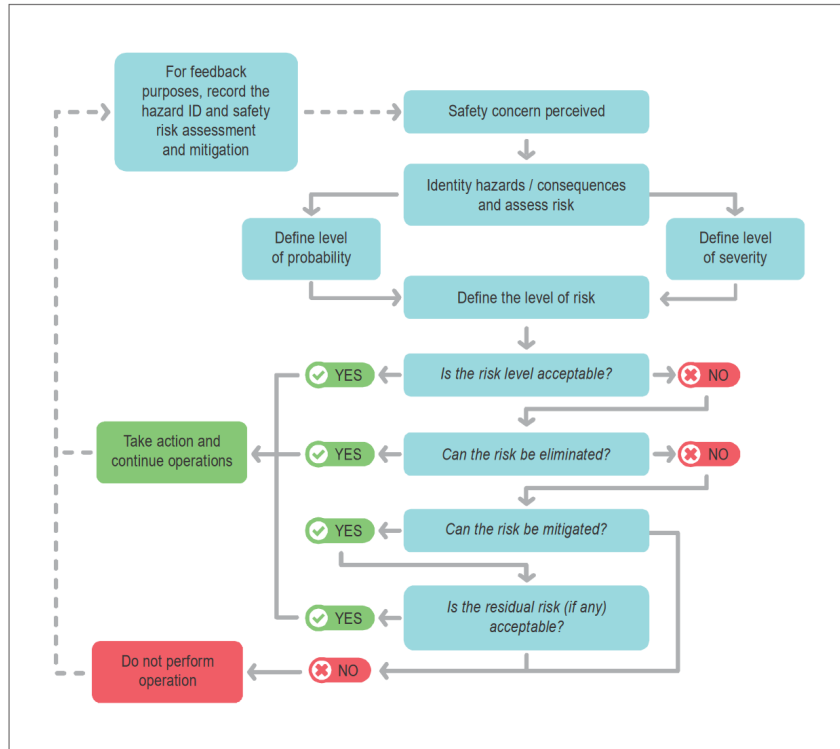


Figure 2-6. Safety risk management decision aid

... but ...

risk-based decision
making
≠
risk assessment



Holistic Approach

Traditional approaches to wildlife hazard risk management in aviation have focused on the airport, targeting at habitat management, exclusion and deterring of wildlife from the airport grounds

(ICAO 9137, ACRP Report 145).

However, the likelihood of wildlife strikes in general and damaging strikes is increased up to an altitude of 3,000 ft and as such in arrival and departure corridors of conventional fixed-wing operations and flight corridors of rotorcraft, general aviation and, in the future, Urban Air Mobility (UAM) operations

(Dolbeer annual report, Dolbeer altitude-strikes, Dolbeer altitude-damaging).

Wildlife strikes are not limited to the airport and, as decades of data collection show, are foreseeable events.

Therefore, a holistic approach to wildlife hazard management in the entire critical airspace involving all aviation stakeholders is required.

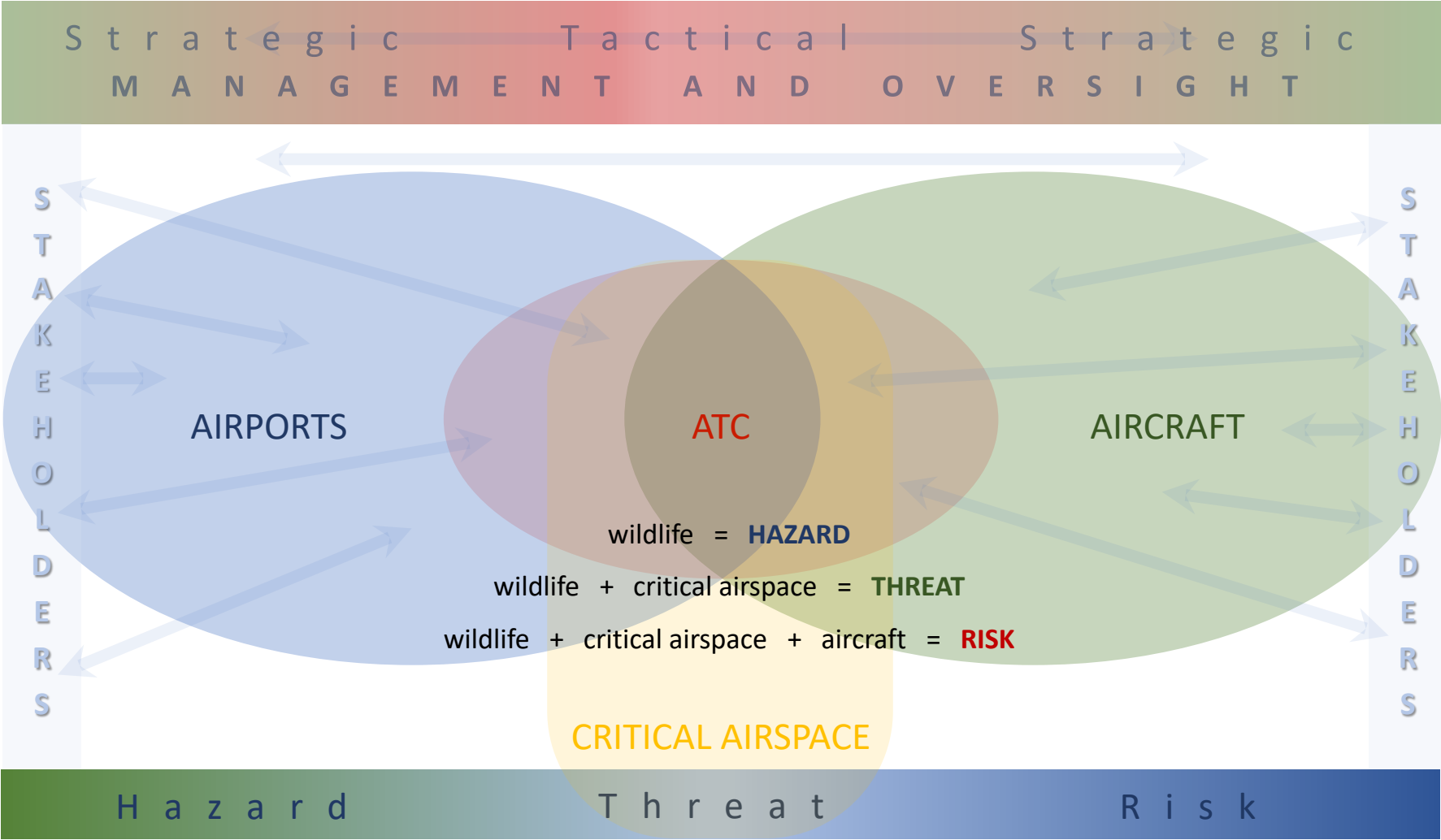




The Three Steps

- Threat Identification
- Strategic Management
- Tactical Management
- learning about weather
- pre-flight weather briefing
- in-flight observations & updates

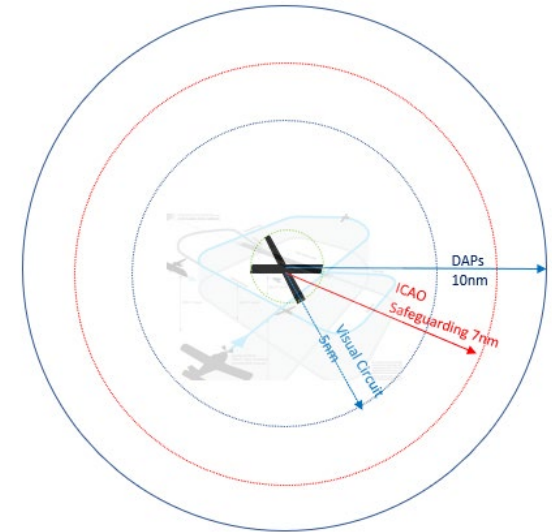


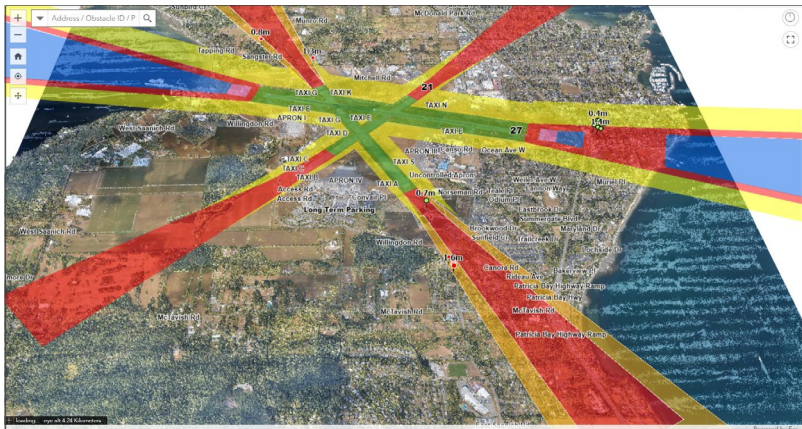


Critical Airspace

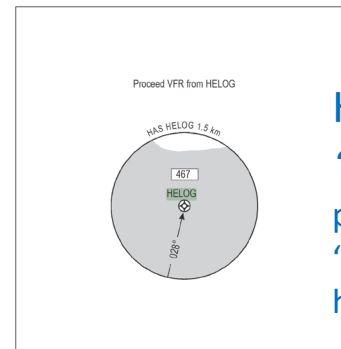
Parameters will depend on the type of operation:

- Schedule Air-transport service (Fixed Wing) - *like* the Obstacle Limitation Surfaces
- General Aviation - the visual circuit area
- Helicopters – *maybe* 1.5 km
- E-VTOL - UAM corridors

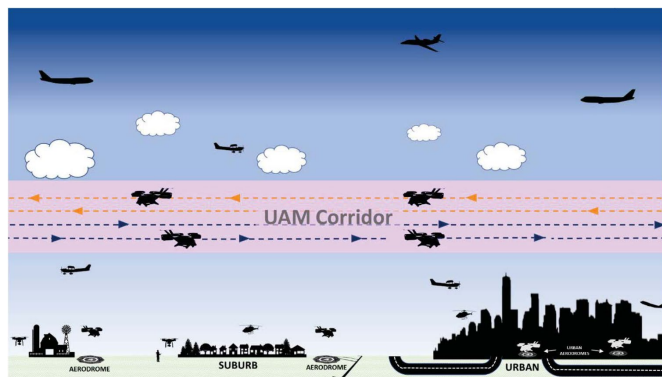




Air-transport



Helicopter Ops
'Point in Space' approach
 procedure with a
'PROCEED VFR' instruction
 height above surface

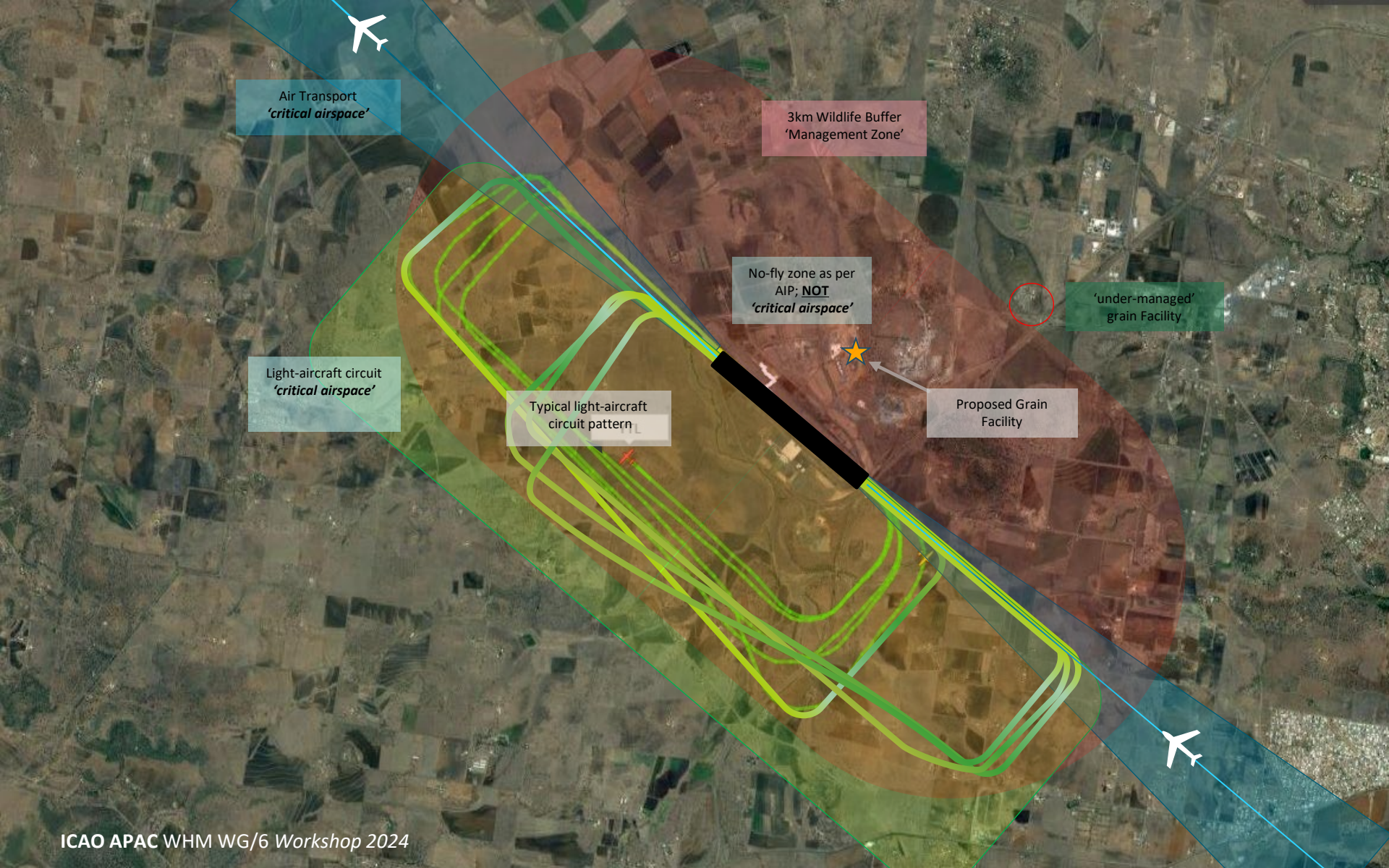


UAM Corridors



GA - Visual Circuit Area





Air Transport
'critical airspace'

3km Wildlife Buffer
'Management Zone'

No-fly zone as per
AIP; **NOT**
'critical airspace'

'under-managed'
grain Facility

Light-aircraft circuit
'critical airspace'

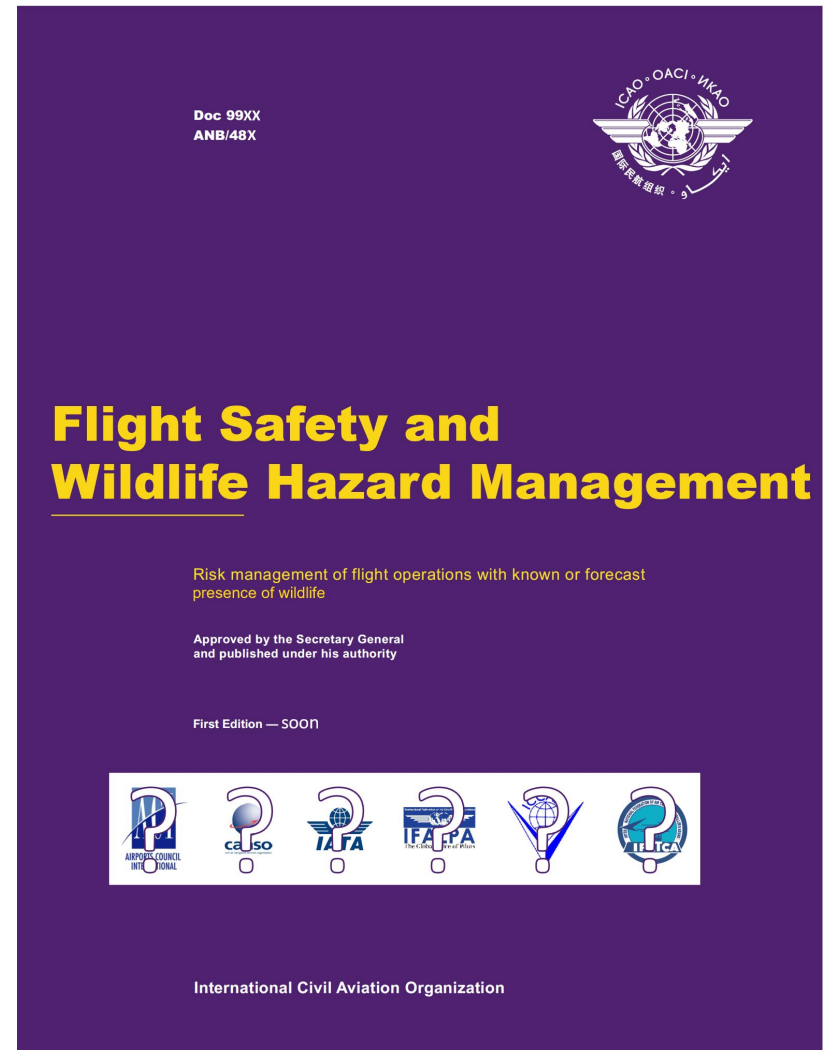
Typical light-aircraft
circuit pattern

Proposed Grain
Facility

What the Future can look like... *if we choose it to...*

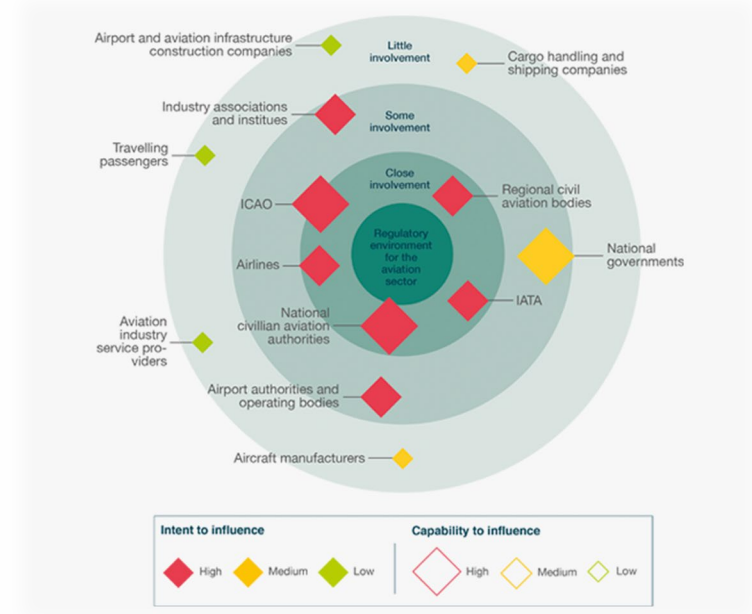
- ✓ All documentation across all domains is consistent
- ✓ All participants understand roles, responsibilities and accountabilities
- ✓ Consistent application of guidance; incl. hazard to threat to risk continuum
- ✓ Inclusion of all relevant participants in communication;
 - ✓ Consider hazards, assess threat and transmit
- ✓ Risk is assessed and a decision made at the correct time by the correct people





Stakeholders and their Responsibilities

- State / Civil Aviation Authorities
- Aircraft Operators & Pilots
- ANSP & Air Traffic Controllers
- Aerodromes/Heliports Designers & Operators
- Engineers and Ground Staff
- Aircraft Manufacturers
- Governments (National, State and Local) - Town Planning



Responsibility \neq Accountability

PRINCIPLE:

to achieve a different outcome, you must try something different

- must objectively consider **where** we risk-manage
- must objectively consider **who** must be involved & how
 - *including* communication, education and promotion

Shared Responsibility = Shared Outcome



ਤੁਹਾਡਾ ਧੰਨਵਾਦ

Tankiu Tumas

ขอบคุณ

khob chái

ありがとう

Akun

Mālō

धन्यवाद

THANKYOU

감사합니다

Salamat

Vinaka

Terima kasih banyak

ধন্যবাদ

Bohoma istouti

唔該/ 多謝

Cảm ơn

Fa'afetai

Shukriya

Tashi Delek

