AVEM insight

Wildlife and aviation don’t mix

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Who are we?

Stu McGraw

David Geil

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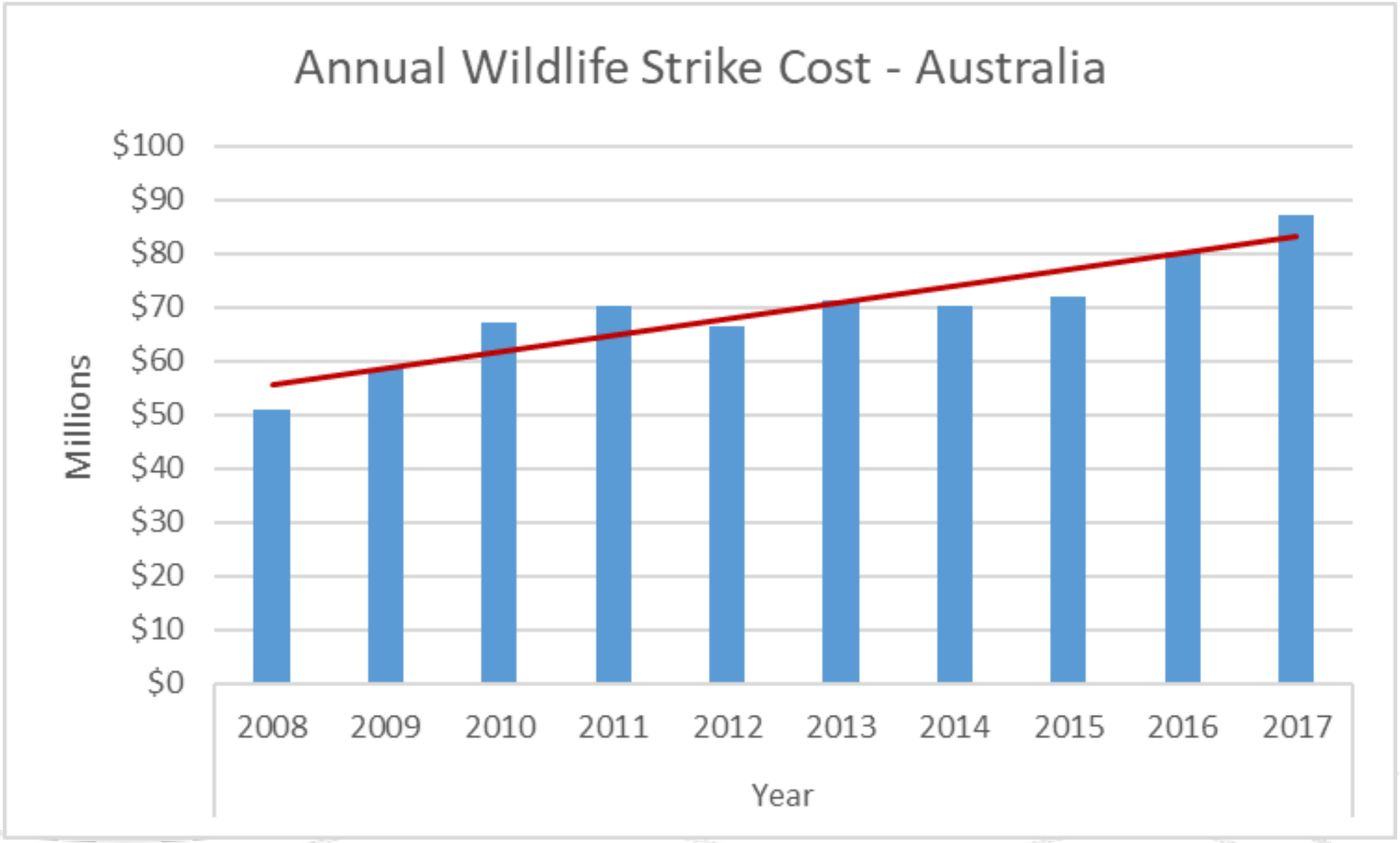
Wildlife hazards represent a significant and rising risk to aviation stakeholders



Source: Allen & Orosz 2001 & ATSB 2017

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1,900+ bird strikes annually

13,000+ bird strikes annually

Estimates from 8 Airlines

Presented at the World Bird Strike and Engineering conference, Tokyo 2016 (Dr Jeff McKee)

Airline	Area of Operation	Fleet Size	Data Years	Estimated Average total Cost /Strike (USD 2016)	Data Reliability
A	Global	>300	2	$54,758	****
B	Europe	<100	2	$ 33,681	***
C	South America	100-300	4	$26,348	*
D	Global	100-300	2	$8,813	*
E	Global	100-300	10	$69,883	****
F	Global	>300	10	$110,752	**
G	Global	>300	10	$7987	**
H	Global	>300	10	$70555	**

MEAN USD $47847

**** *Complete cross referenced internal data sets supplied. Clearly well maintained database with only a few minor anomalies or incomplete fields*

*** *Incomplete dataset or a presentation summarising the data in a relatively comprehensive and logical fashion*

** *Poorly maintained data sets with large gaps and incomplete fields where approximations and assumptions were made to help normalise*

* *Unsupported statement about costs but presented by an airline in a formal setting*

AVISURE australia AusALPA BRISBANE AIRPORT Perth Airport

- Number & rate of bird strikes per 10,000 movements is increasing globally
- Global aviation wildlife related costs exceeded US$2.5b in 2017 (and increasing)

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Why are the numbers rising?

Environmental encroachment

Increase in total flights

Increasing wildlife populations

Quieter faster 2-engine aircraft

NOTE: These are universal UNCONTROLLABLE factors

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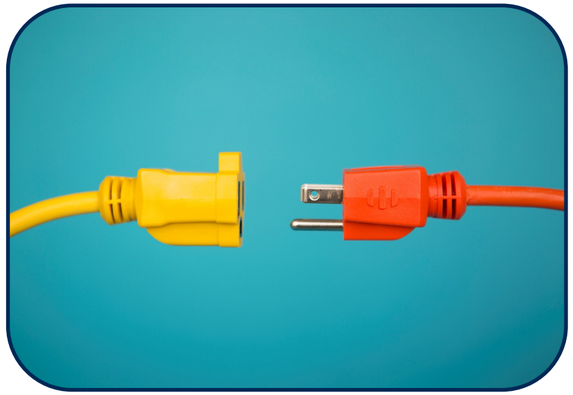
Why hasn't tech stopped the increase?

Low reporting %



Disparity of systems

Siloed vision (tribalism)

Reactive / unfocused management

NOTE: These are human-centric CONTROLLABLE factors

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How do we turn the tide?

Airlines & airports need to control three elements:

- **RISK**
- **COST**
- **BRAND**

Each is inter-connected, a change in one will influence the others.

AVEM is about controlling risk and lowering costs by addressing the factors that CAN BE CONTROLLED. Your BRAND can then flourish.

Let us show you…

REPORTING - CURRENT

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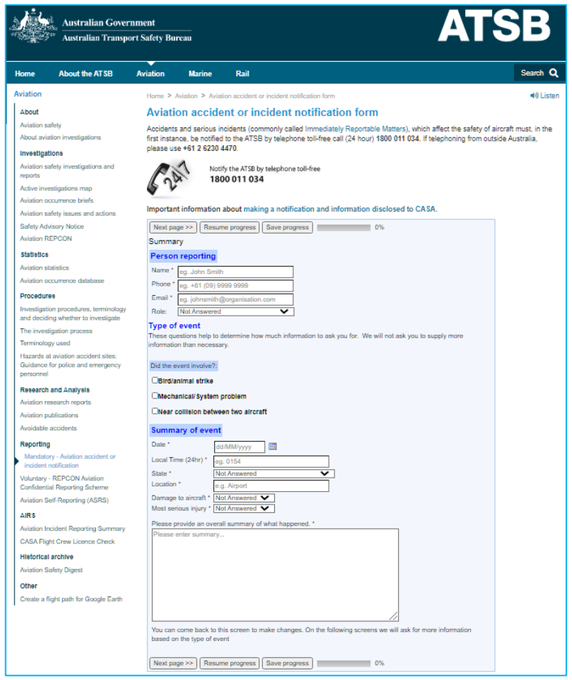
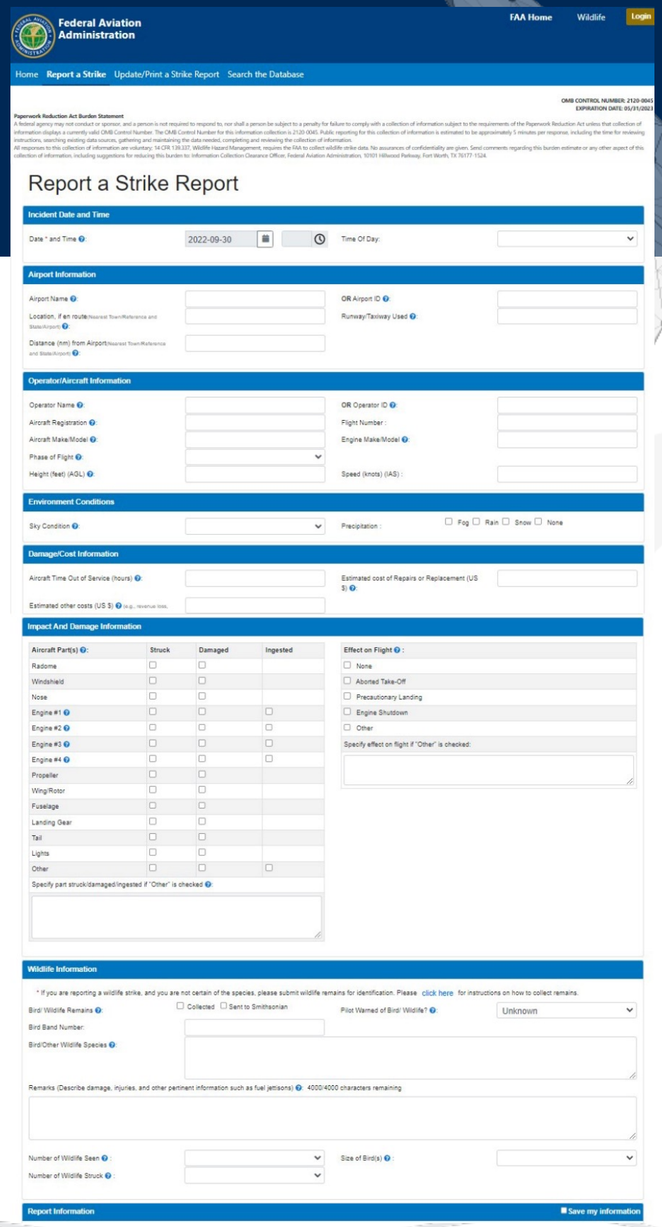
- Web-based
- Time consuming
- Overly complex
- Not intuitive





REPORTINGconfirm

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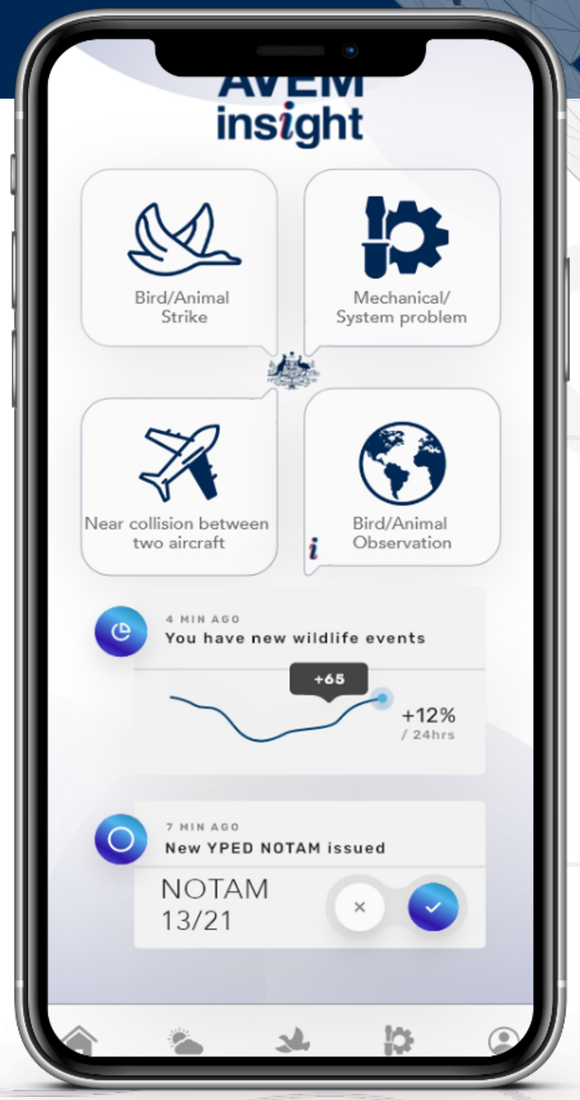
1. Multiple report types supported: bird strike, mechanical issue, air incident, etc. (increased utility = higher uptake)
2. Includes valuable supplementary data (weather, NOTAMs, etc) to further increase utility
3. Significant portion of mandatory reporting fields are pre-populated (simplification = higher uptake)
4. Automates mandatory reporting data flow into Gov't database/s (reduced overhead = higher uptake)



confirm

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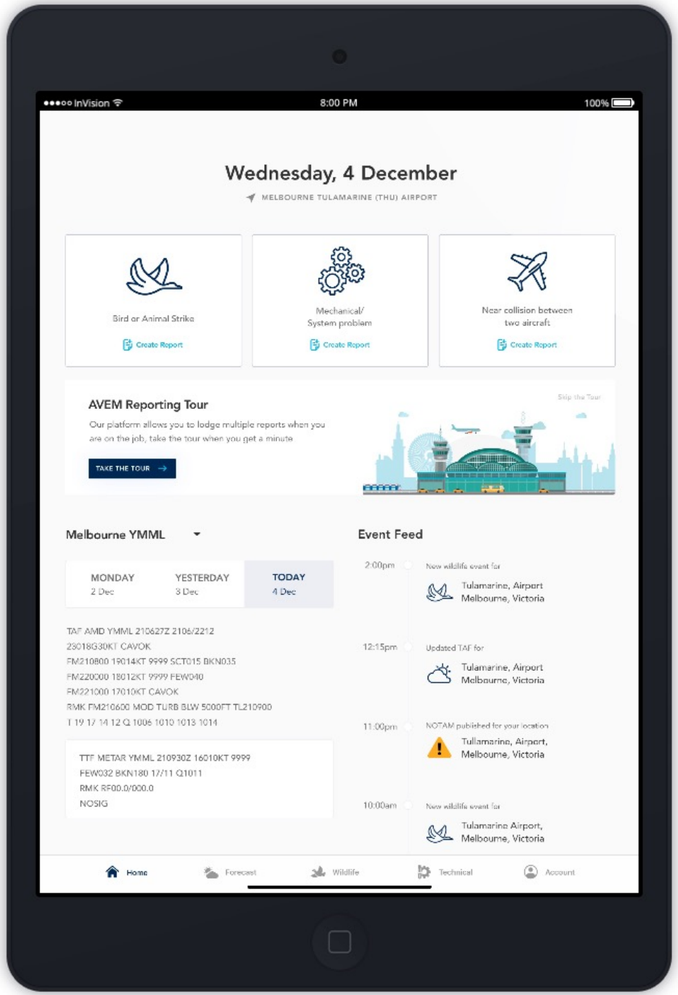

Can be integrated with corporate enterprise systems for Group level reporting alignment

5

Multiple form factors: mobile, tablet (leverage existing devices = higher uptake)

6

Dashboard for users to increase awareness of recent events at subscribed locations (increased value = higher uptake)

7

Form content tailored to your local Regulator/Corporate requirements

8

SYSTEM DISPARITY - CURRENT

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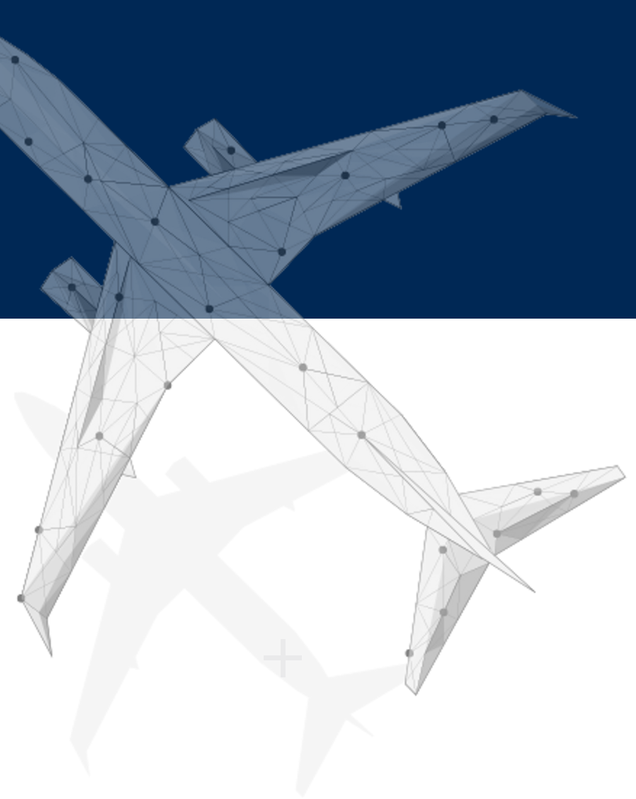

1. Multiple systems for multiple tasks – wildlife observation tool, risk assurance tool, ATC mgmt.,
   flight planning, EFB, etc, etc.

2. The total view of wildlife risk is limited to your own airfield – no collaboration/data from other sites that may be experiencing similar trends/issues

3. 3rd party stakeholders (airlines, private aviation, insurers, national ATC) have extremely limited view of wildlife risk (NOTAM: CAUTION BIRDS ON APPROACH)

4. No ability to share data and/or leverage multi-systems data to provide valuable predictive analysis

SYSTEM DISPARITY

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1. Observation data is fused with historical event data

2. The resulting data set is assessed by A.I. to provide a view of future potential risk

3. The A.I. considers extant factors – active runway/s, approach/departure paths

4. Specific risk thresholds are set by the system owner

maxim

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5

MAXIM then provides an ongoing prognostic assessment of when/where specific risks will occur that require remediation. This information can be used in planning wildlife management activities more efficiently

6

This de-identified forecast data can then also be shared with airport users via CONFIRM or with enterprise planning systems via avianAPI

maximANALYTICS

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TRIBALISM avian API

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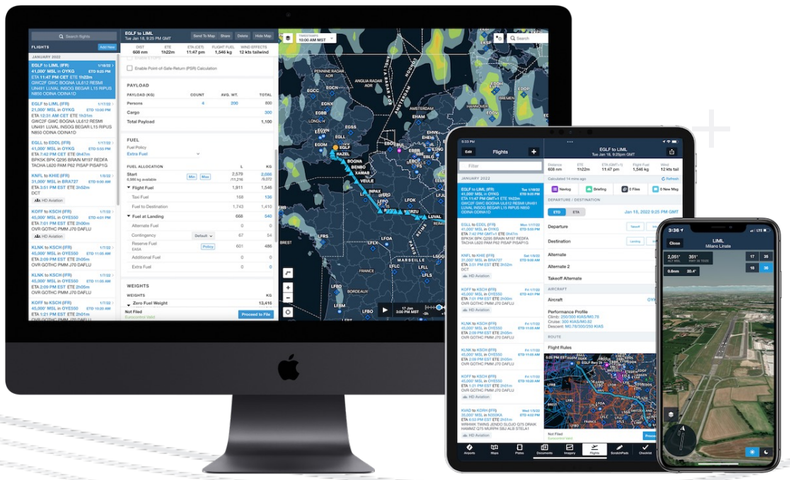
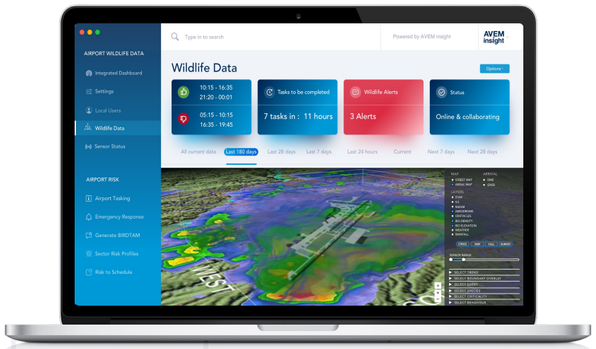
MAXIM prognostic data can also be provided to external interested parties via API (airlines, etc.) for native integration into flight planning tools (when it is actually actionable!), EFBs (simple wildlife risk overlay), databases (ATC, Insurance), etc.



avian API



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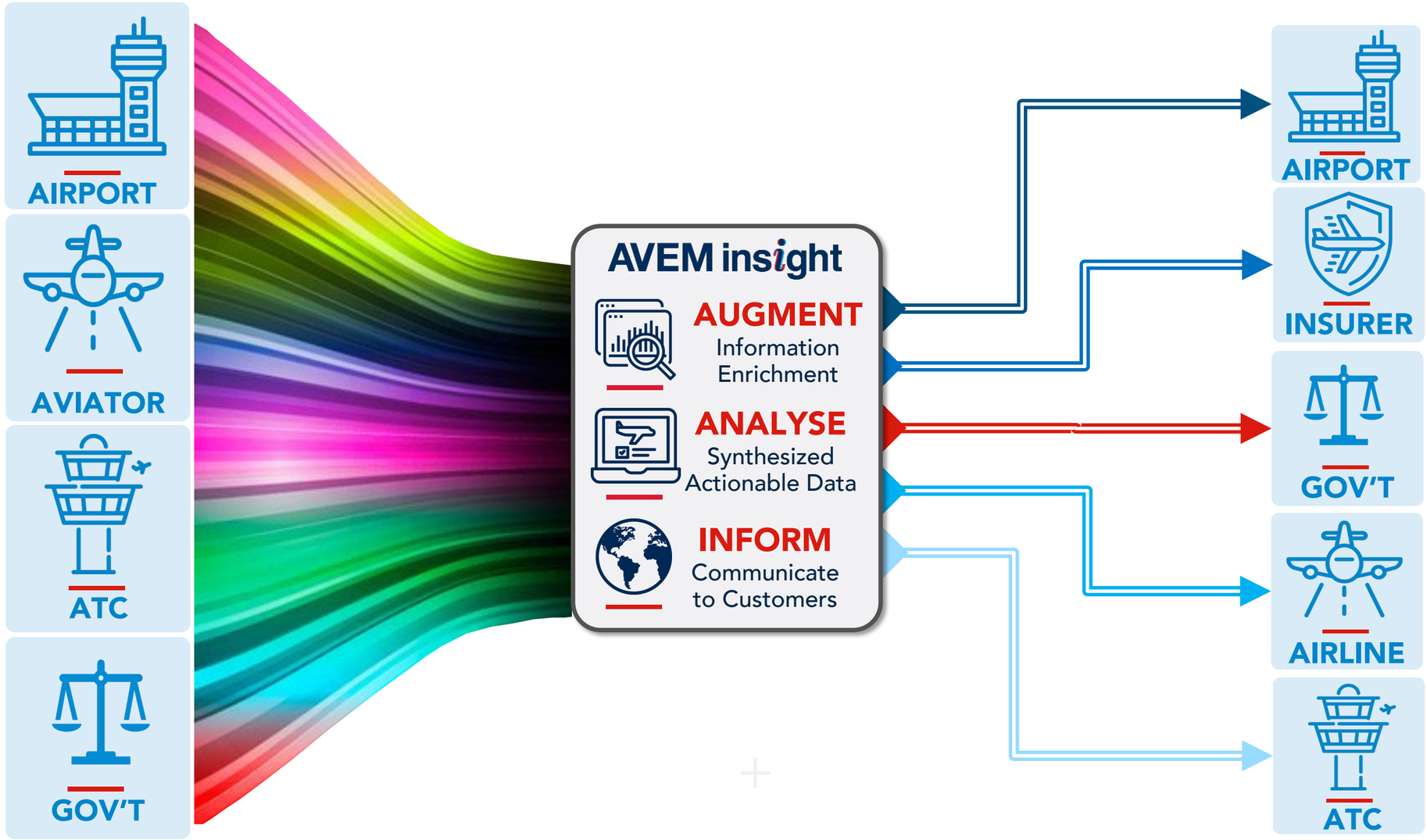
THE GOAL – To deliver tailored, actionable, wildlife threat data to enable greater focus in overall risk management



VALUE PROPOSITION

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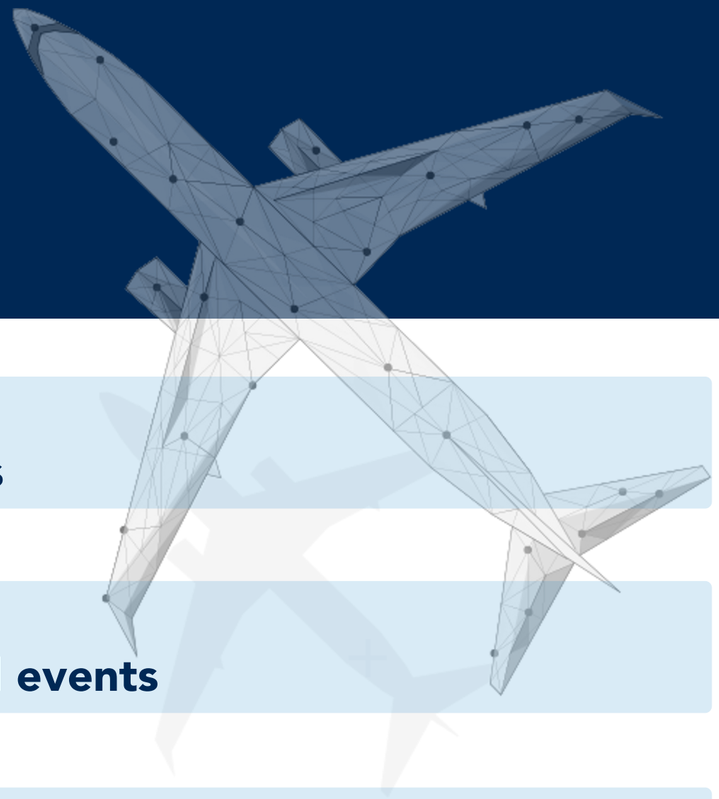

Cost Reduction

Reduction in direct/indirect costs due to decreasing wildlife interactions

Risk Reduction

Uncertainty lowered by reducing the number and impact of unexpected events

Brand Value

Brand protection from negative press events – Market against an innovative conservation mindset

Operational Efficiency

Target existing assets in a more efficient manner to ensure better outcomes

Insurance Savings

Leverage richer heuristic data sets that underpin indemnity negotiations

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MORE INFO

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