

1 December 2020



SAFETY PERFORMANCE AND IMPROVEMENTS

AIRLINE SAFETY FORUM

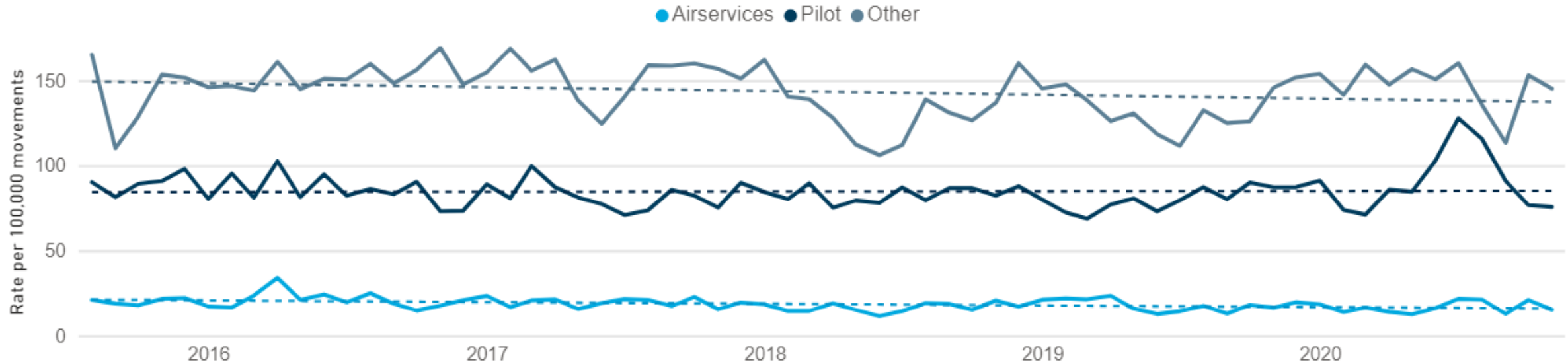
Dr Steven Barry, Risk Intelligence

OUR SAFETY PERFORMANCE AND IMPROVEMENTS

Our focus has been on ensuring the changing aviation situation is not affecting safety and that we are ready for when aviation recovers.

- Trends and 2020 performance during COVID-19
- Key areas of focus in 2020
- Focus for 2021

RATE OF SAFETY OCCURRENCES



The rate of occurrences remains steady with an overall reduction since 2016.

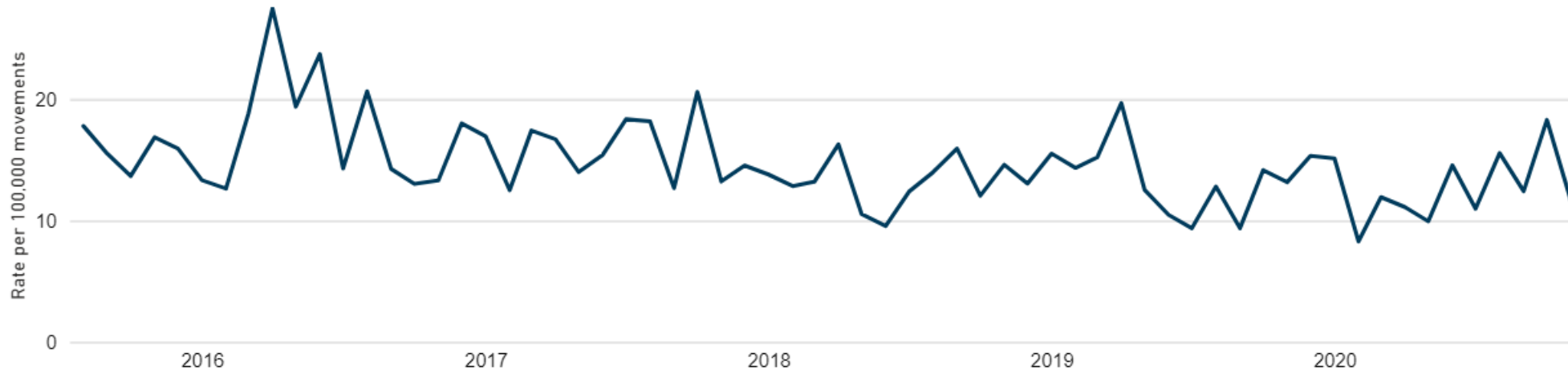
Some spikes in the 'rate' in mid-2020 are statistical artefacts of dividing a count by a small number of movements. Sometimes a 'rate' is not the most effective measure of risk.

RATE OF INADEQUATE SEPARATION ASSURANCE AND INFORMATION ERRORS

The rate of ISA remains steady with an overall reduction since 2016.

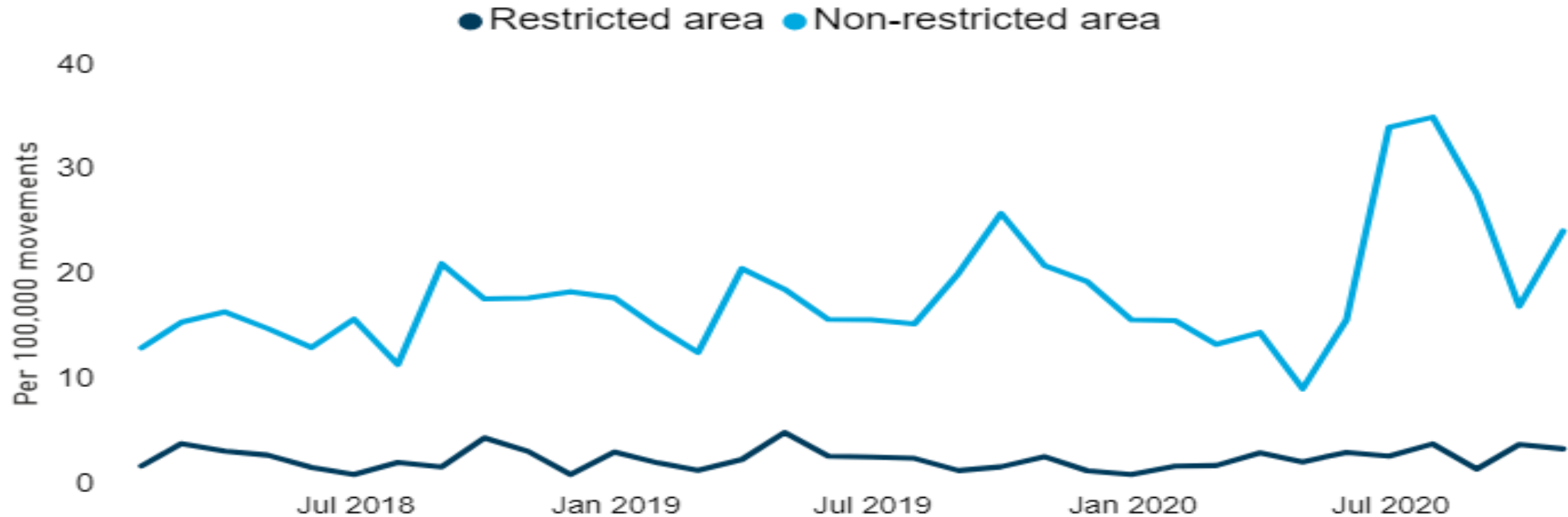


The rate of Information Errors remains steady with an overall reduction since 2016.



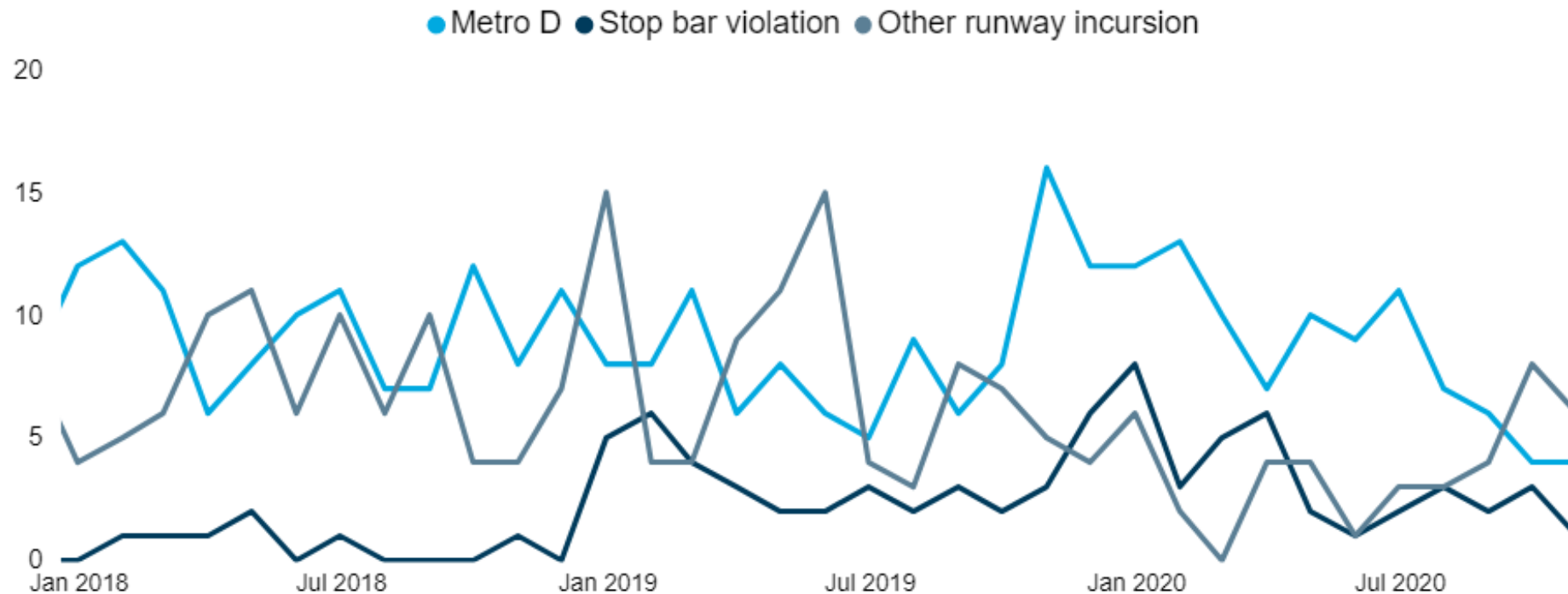
RATE OF AIRSPACE INFRINGEMENTS

The rate of AI increased in 2020 due to Sunshine Coast redesign and because the 'rate' metric is not as appropriate when movement counts are small: AI are driven by non RPT aircraft which continued to fly, whereas overall 'movements' dropped with the drop in RPT traffic.



RATE OF RUNWAY INCURSIONS

The rate of runway incursions remains steady.

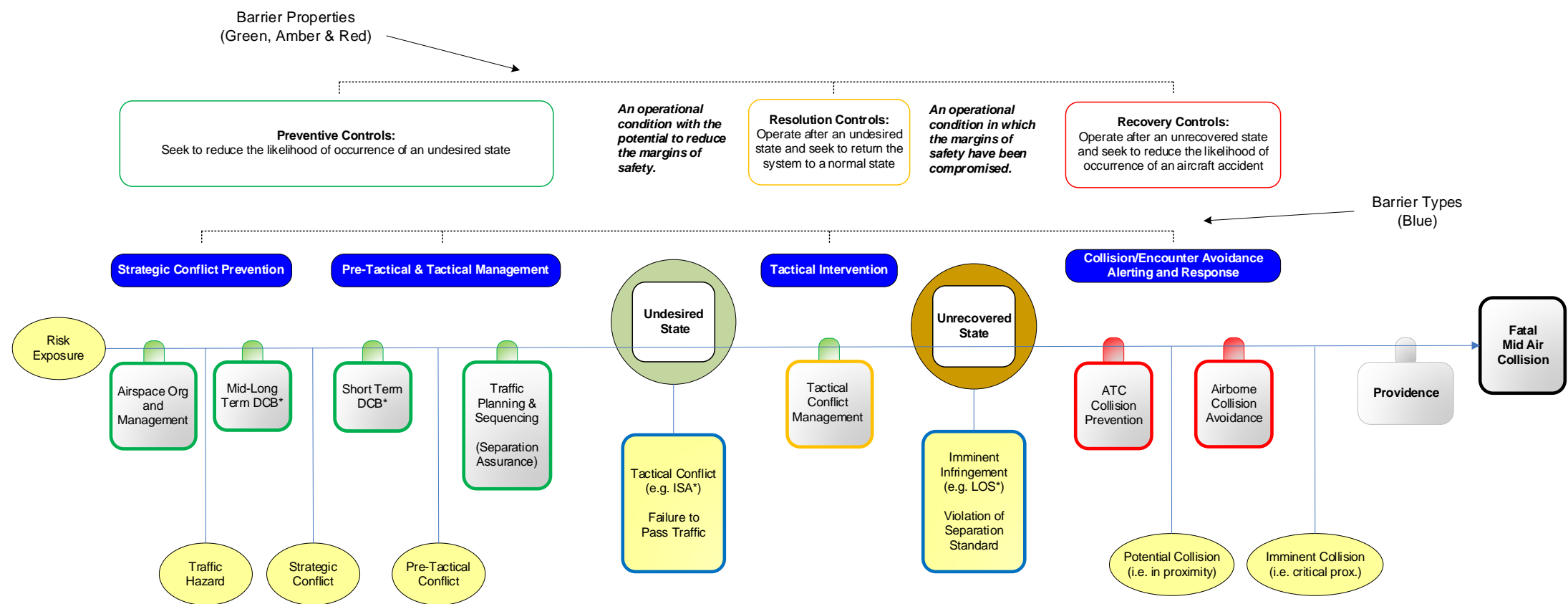


FOCUS FOR 2020

- Metro D airports – analysis of key risk factors
- Sydney IVA – focus on new design to remove TCAS RA risk
- Canberra Airport Lighting Control System faults
- Brisbane Stop Bar false alarms
- Risk for non-towered and regional airports
- Risk for RPAS (drones) around airports
- Risk associated with the growth in unmanned vehicles launching and operating in the upper flight levels
- A new ‘barrier-model’ for assessing risk for occurrences – which barriers failed allowing an occurrence but which barriers were successful in preventing it escalating?

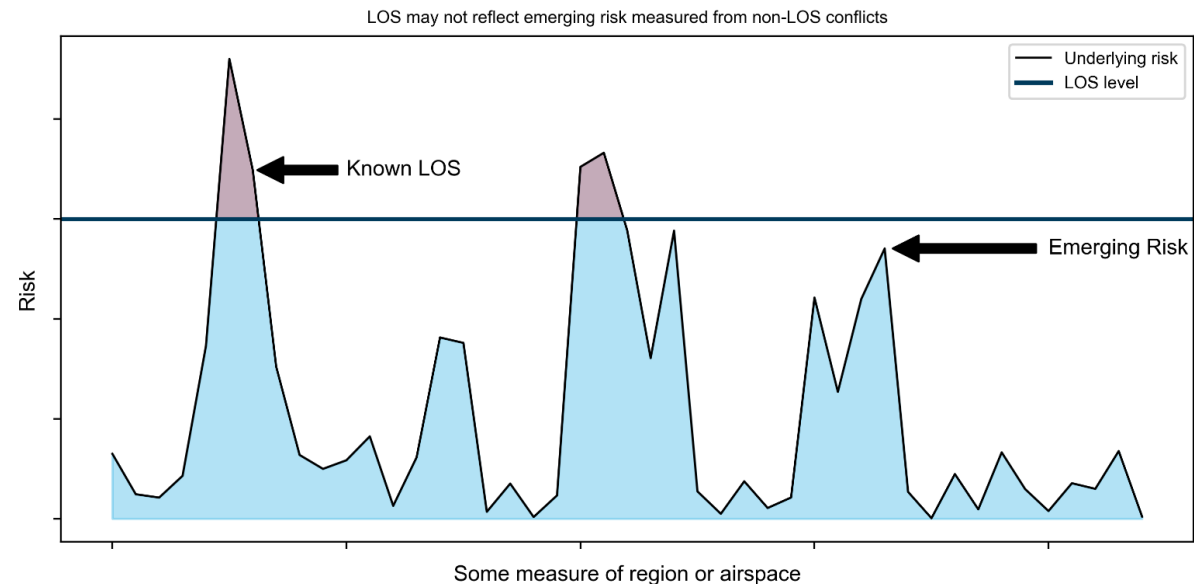
BARRIER MODEL

Airservices Mid-Air Collision TMA Barrier Model



FOCUS FOR 2021

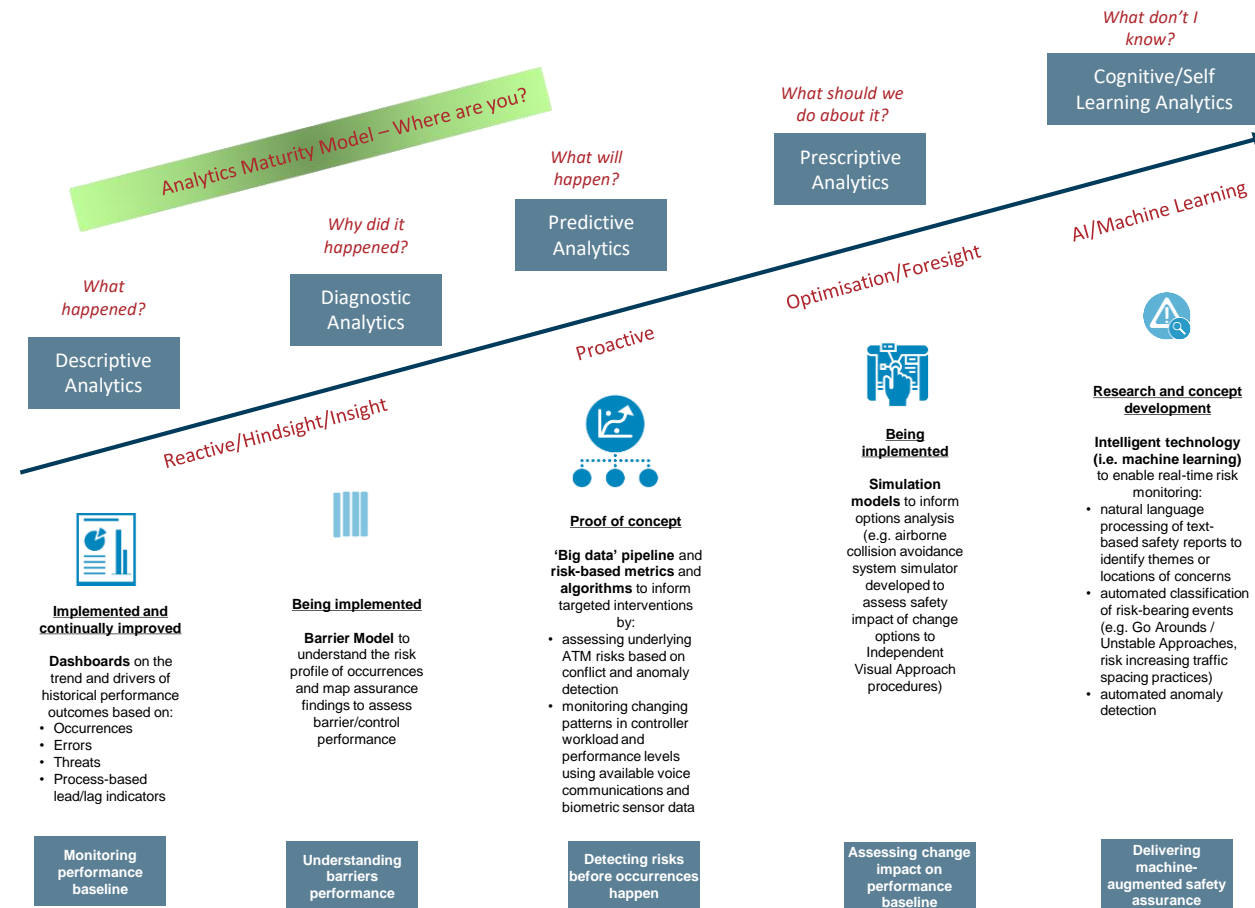
- Methods to reduce LOS / go-around rates due to occupied runways during peak periods: ensuring this is in place for the recovery period.
- New methods for detailed risk analysis
- RPAS risk and monitoring
- Analysing the risk associated with VFR aircraft operating near IFR aircraft, and IFR-IFR risk in non Class C airspace
- Looking for emerging risk



FOCUS FOR 2021 - RISK ANALYTICS

What we set out to do

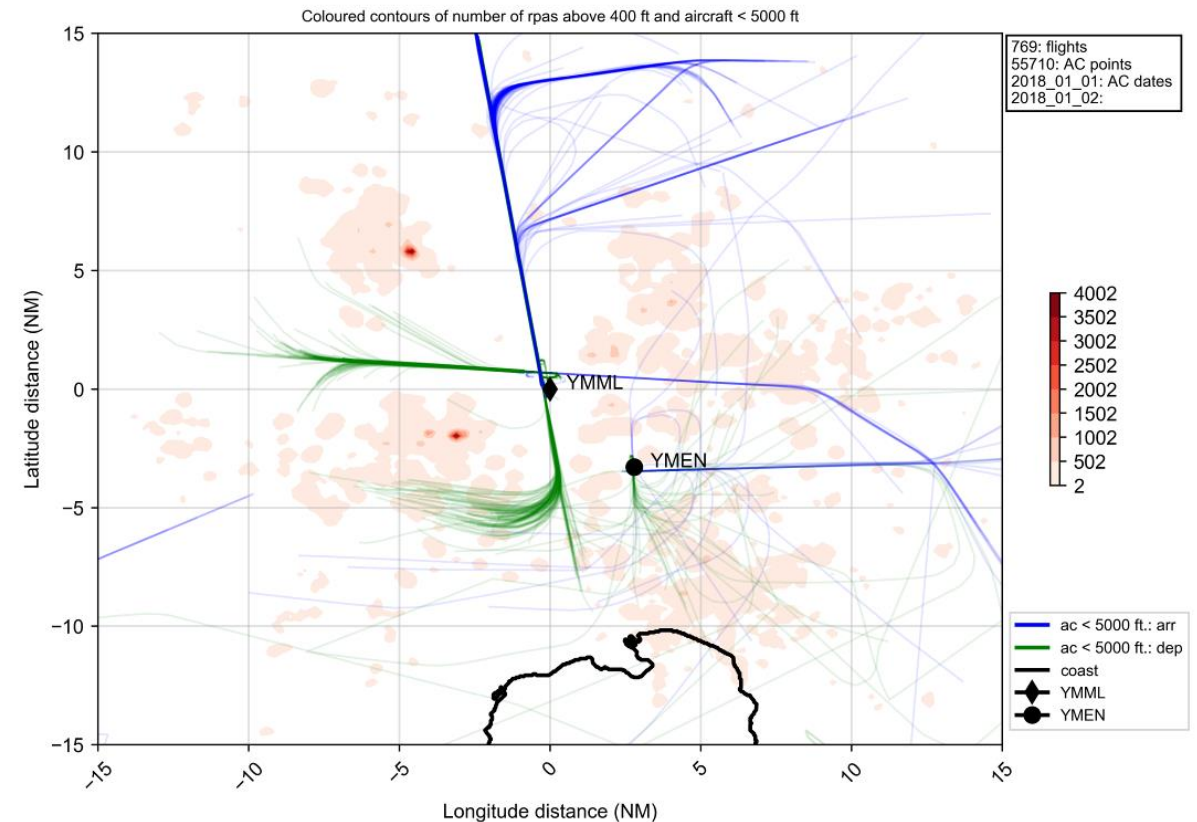
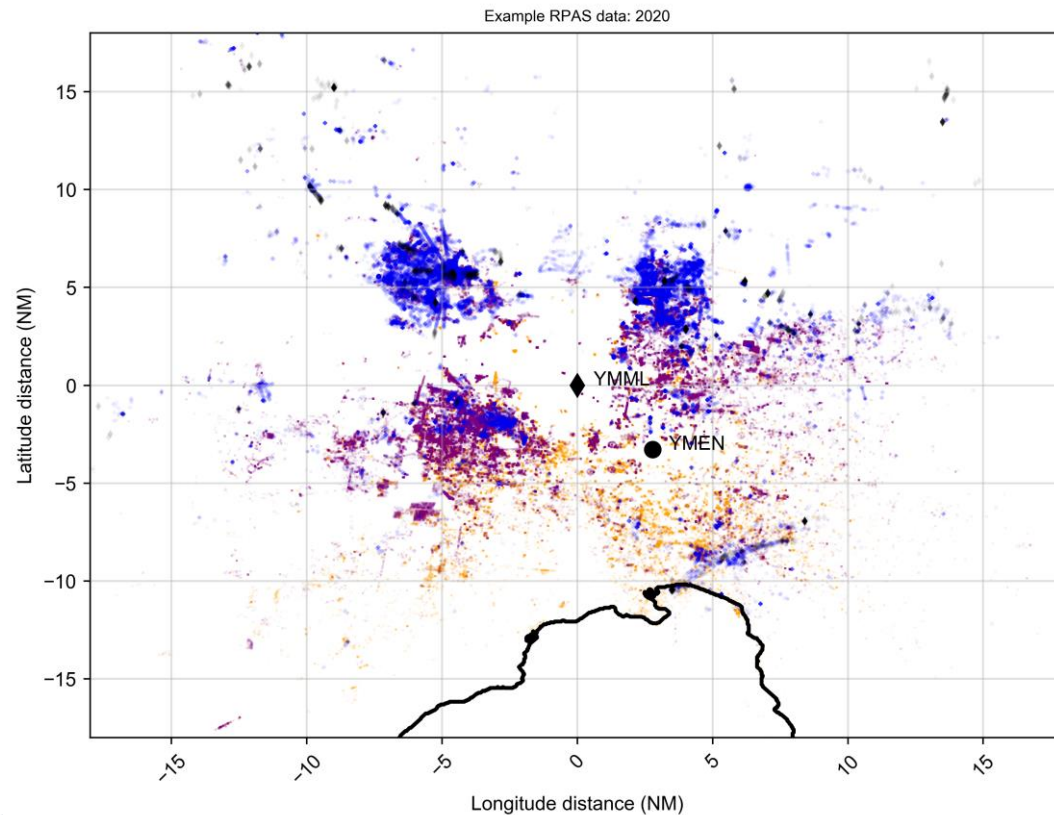
Objective: Shift from reliance on retrospective analysis to a more proactive and predictive approach



This part of the presentation provides examples of how we are shifting our approach and building models which will allow us to embed Artificial Intelligence and Machine Learning in the near future.

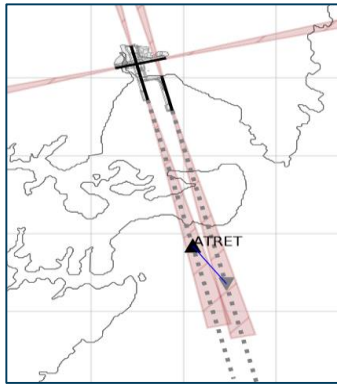
FOCUS FOR 2021 – RPAS RISK

- RPAS risk and monitoring
 - Monitoring where RPAS operate and what are the risk areas to focus on

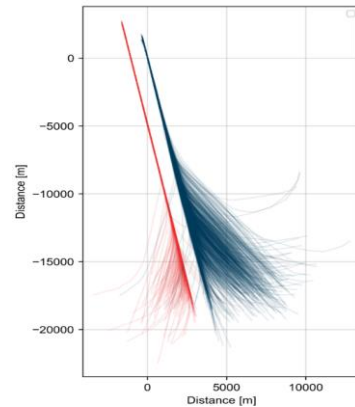


OPTIMISATION – *improving options analysis*

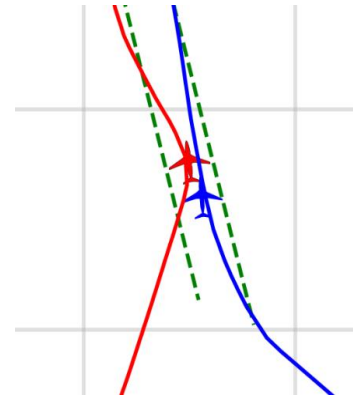
Example: Sydney Independent Visual Approaches (IVA) - We have reduced collision risk and reduced Traffic Collision Avoidance System (TCAS) alerts, improving safety while maintaining efficiency of service delivery.



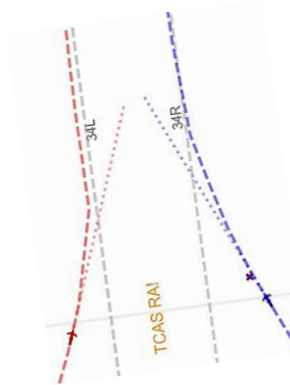
New procedures with 1.7NM diagonal approach offset were modelled



These used simulations based on existing traffic



The risk of collision due to two aircraft simultaneously overshooting is now negligible



The risk of TCAS Resolution Advisory is now 80% less

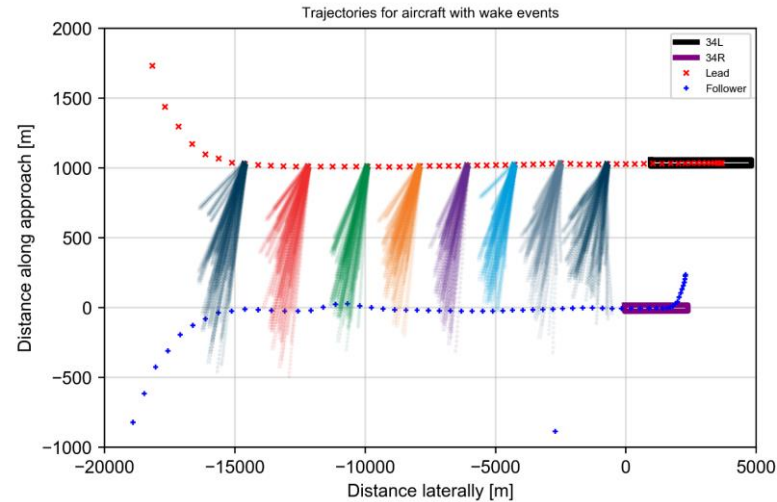
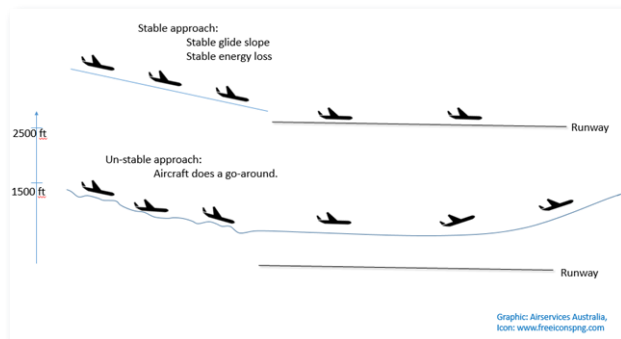
Advanced modelling to address emerging risk areas

Anomalous behaviour

- We are working on identifying unusual aircraft behaviour.
- We are developing new methods for estimating wake turbulence risk, and modelling the probability of a wake vortex drifting to the parallel Sydney approach – preventing wake events before they happen.

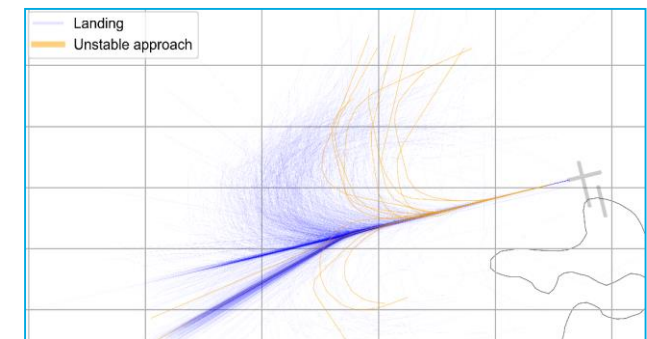
Unstable approaches – precursor for runway excursions

- We can now identify aircraft that are unstable on approach.
- We can link the probability of an unstable approach to weather, approach type, our procedures.
- With this knowledge, we can now reduce the potential for our actions to unknowingly contribute to an unstable approach.



Go-arounds and LOS for arrivals

- We can identify the cause of approximately 80% of go-arounds.
- Our analysis has informed changes to procedures and guidance to controllers on recommended arrival spacing and departure sequences to reduce preventable go-arounds and LOS due to a 'slow departure'.
- We are focusing on designing out known threats ahead of the return of pressure as the aviation system returns with increased traffic levels.



THANK YOU

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