



Turbulence  
Aware

# Facilitating industry shift to data-driven turbulence mitigation



Turbulence  
Aware

# Turbulence is

The leading cause of injuries to cabin crew and passengers in non-fatal accidents (FAA)

Costing the aviation industry hundreds of millions of dollars every year

Causing brand damage and contributing to the fear of flying

University research around turbulence, is pointing to an increase in both severity and frequency



# Recent Events:

- On 21 May 2024, a Boeing 777-300ER operating LHR-SIN, encountered severe turbulence over Myanmar, resulting in the death of a passenger and leaving 144 crew and passengers injured
- The aircraft was diverted to Suvarnabhumi Airport in Bangkok, Thailand
- On 26 March 2026, an A350 from LAX to SYD encountered turbulence during descent strong enough to launch cabin crew into the air
- Whilst it was a brief encounter and the aircraft landed safely, four cabin crew were reported injured, with three transported to hospital with minor injuries



# Current tools :

Pilot Reports (PIREPS) are subjective

Forecasts may be inaccurate and hours old

Weather radar cannot detect clear air turbulence

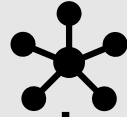


# Industry shift to data-driven turbulence management

Technical advancements now enable aircraft to accurately calculate the turbulence state of the atmosphere in flight



# Introducing Turbulence Aware



A global platform **for sharing** automated EDR\* turbulence reports in real-time



**Airlines own their data**



**Turbulence  
Aware**



**Integration** with in-house or third-party flight planning or in-flight weather tools, as well as ATM and MET situational awareness tools



**Detailed report** available **for each data point** – to increase situational awareness



Anonymized data – To protect airlines' identity and privacy



**Turbulence  
Aware**

# What is real-time turbulence data?

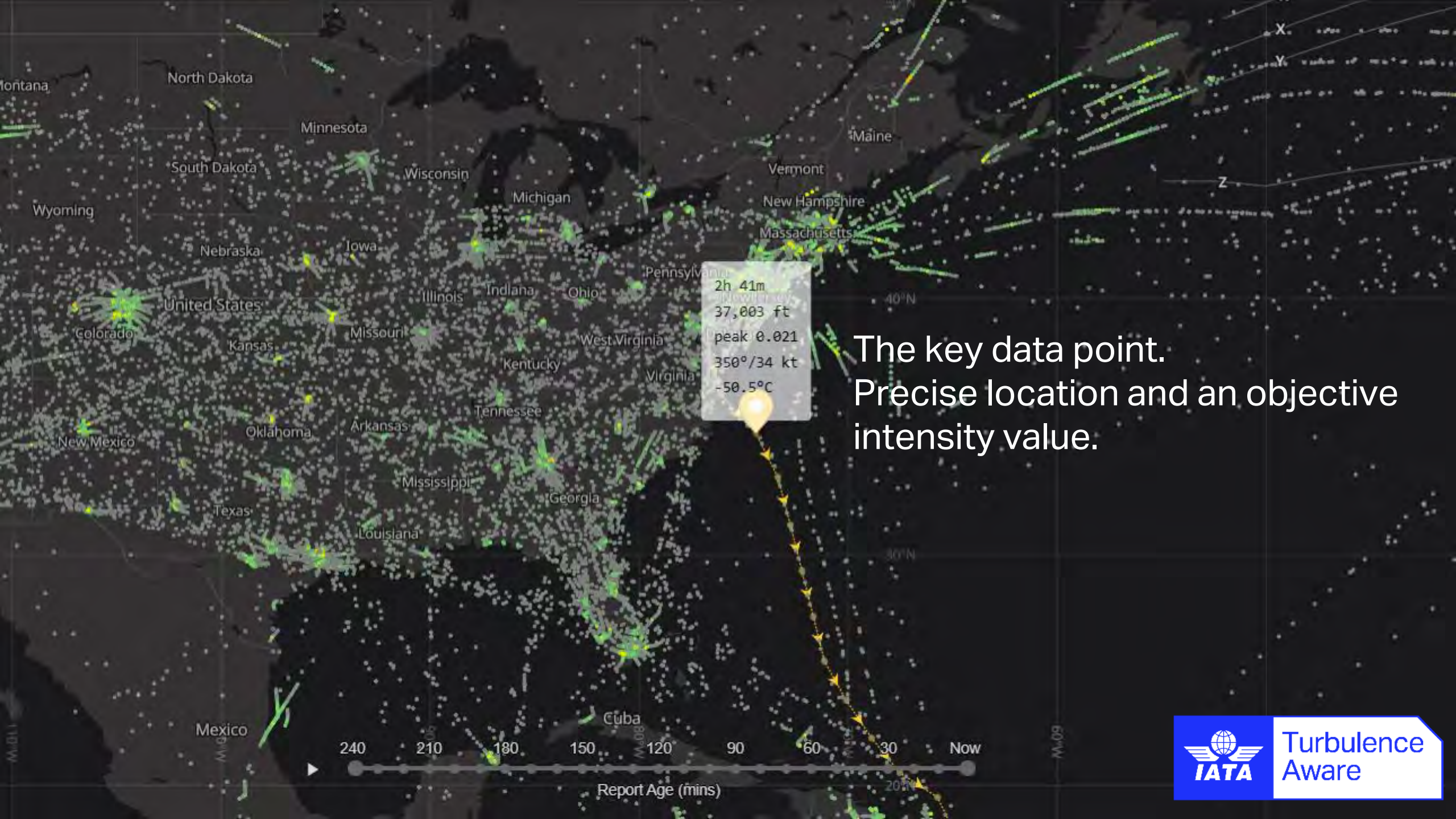
## Eddy Dissipation Rate (EDR)

- Turbulence intensity metric measuring the **state of the atmosphere** around an aircraft in flight
- An **aircraft independent** absolute value
- Simple **software installation** based on NCAR v2 open-source algorithm
- **No hardware** required to calculate EDR

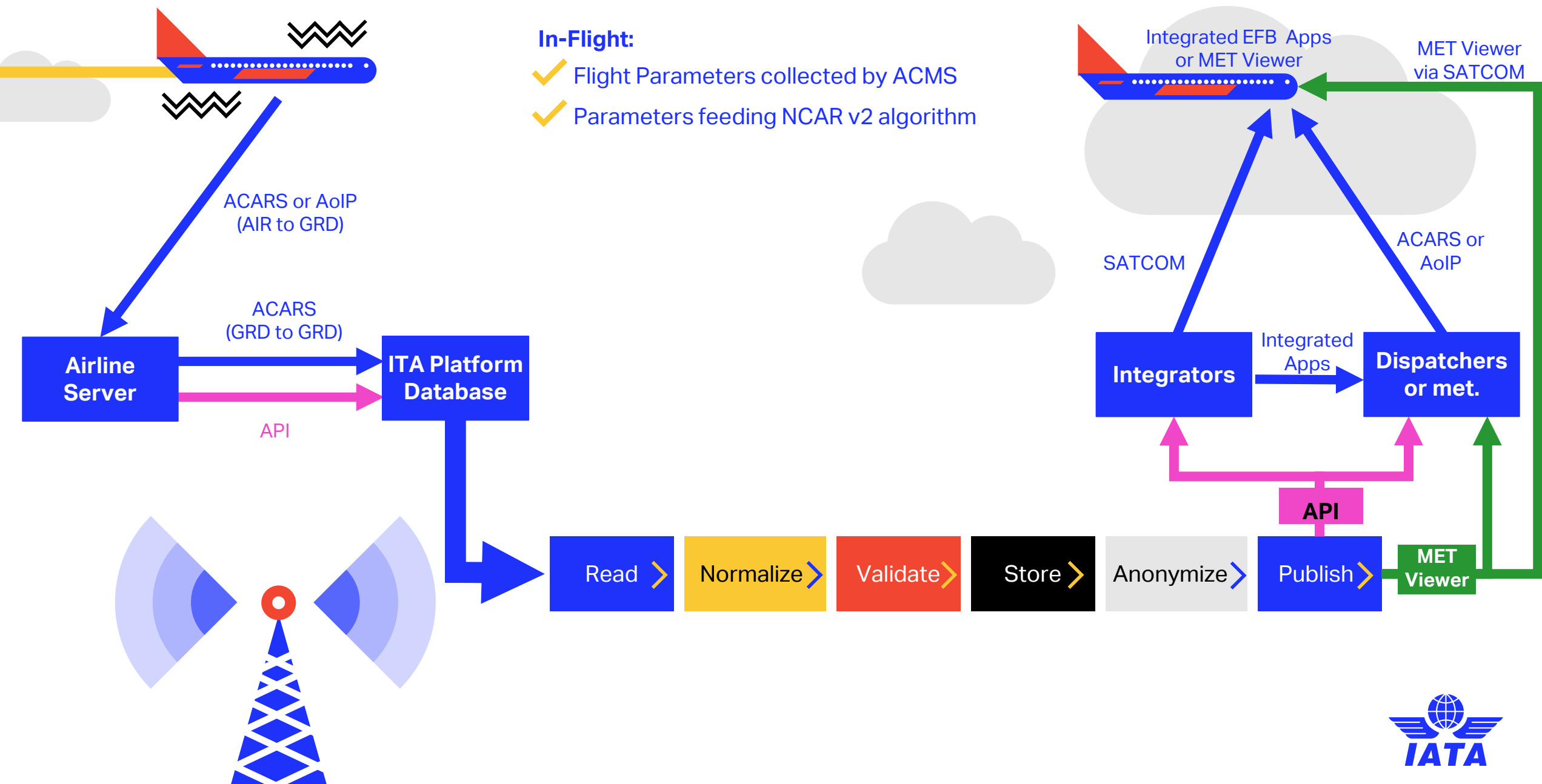


# Parameters delivered for each report listed below:

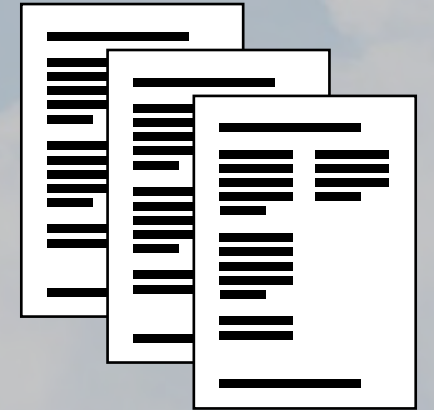
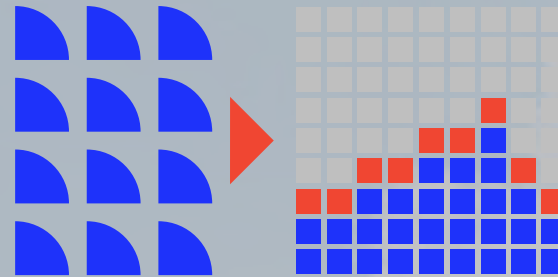
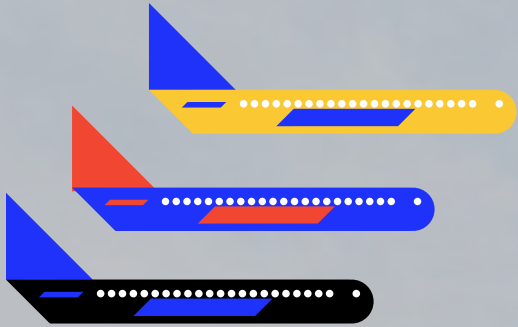
| Parameter              | Explanation                                         | Example              |
|------------------------|-----------------------------------------------------|----------------------|
| Observation Time       | Time of report in UTC                               | 2020-05-13t00:00:00Z |
| Altitude               | Altitude Above Sea Level in feet                    | 35,000 ft            |
| Latitude               | Geographical coordinate of the report for latitude  | 22                   |
| Longitude              | Geographical coordinate of the report for longitude | 120                  |
| Peak EDR               | Maximum EDR value in the calculation                | 0.37                 |
| Mean EDR               | Average EDR value of the calculation                | 0.12                 |
| Wind Speed             | Wind speed in knots                                 | 40kt                 |
| Wind Direction         | Wind direction in radial degrees                    | 270°                 |
| Static Air Temperature | Temperature in degrees Celsius                      | -55.0 °C             |



The key data point.  
Precise location and an objective  
intensity value.



# IATA Turbulence Aware in figures



---

**3300+**

Reporting Aircraft

**31**

Airlines feeding  
data to the Platform

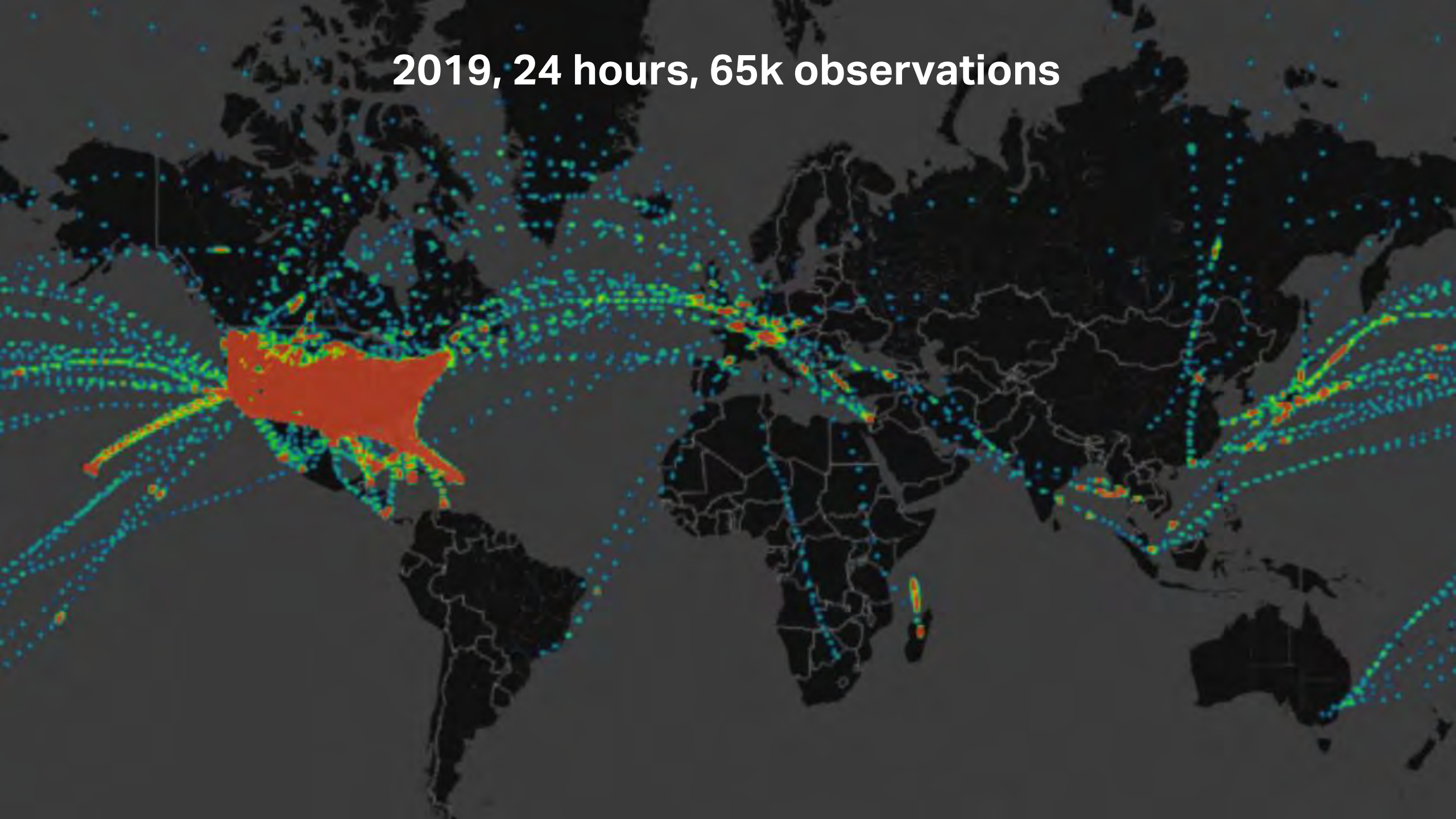
**14**

Service Providers  
signed to **integrate**  
data

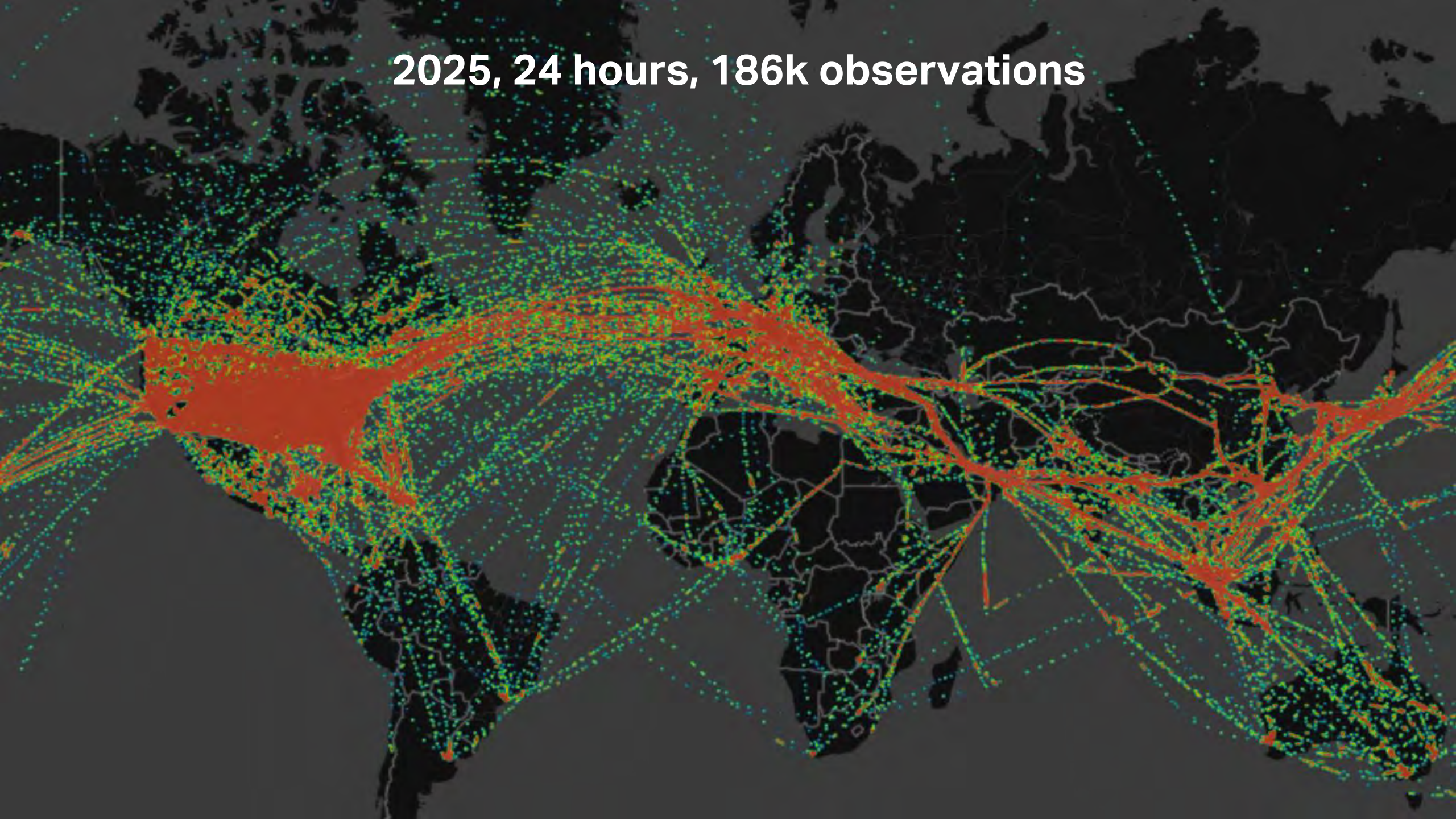
**200+M**

Turbulence Reports  
received

**2019, 24 hours, 65k observations**

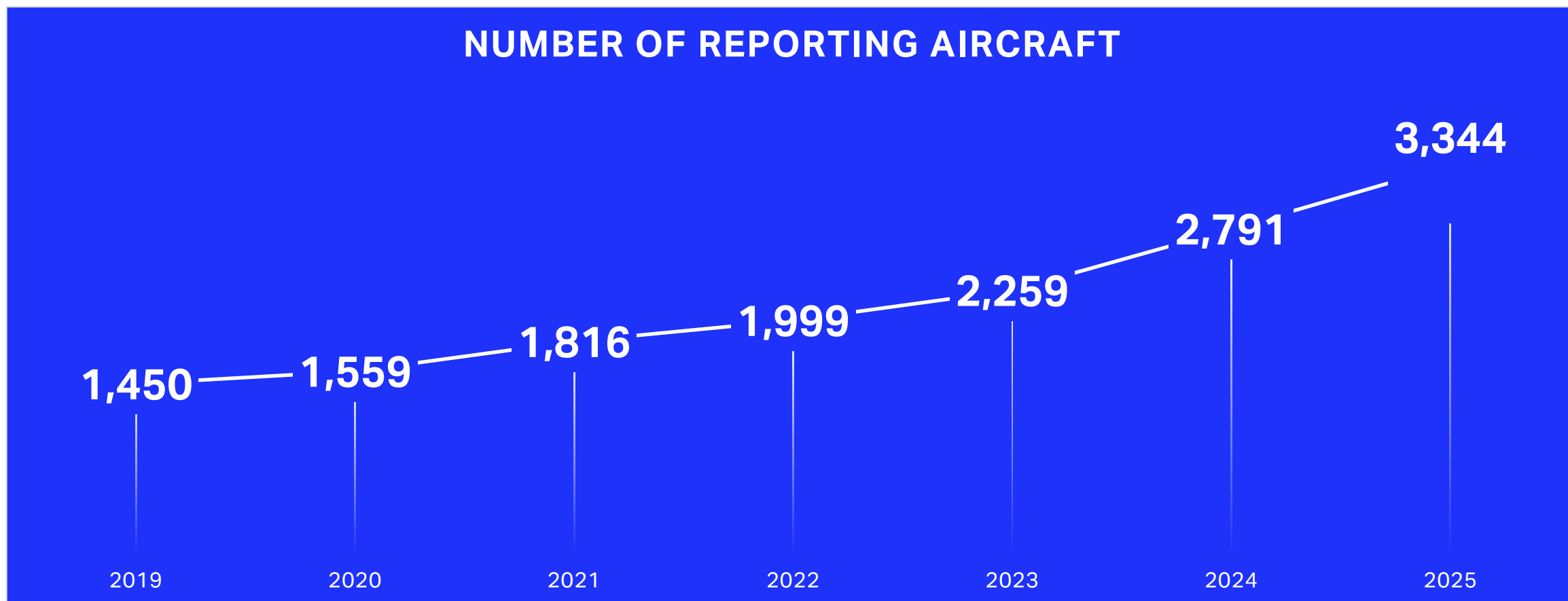


**2025, 24 hours, 186k observations**





# Evolution

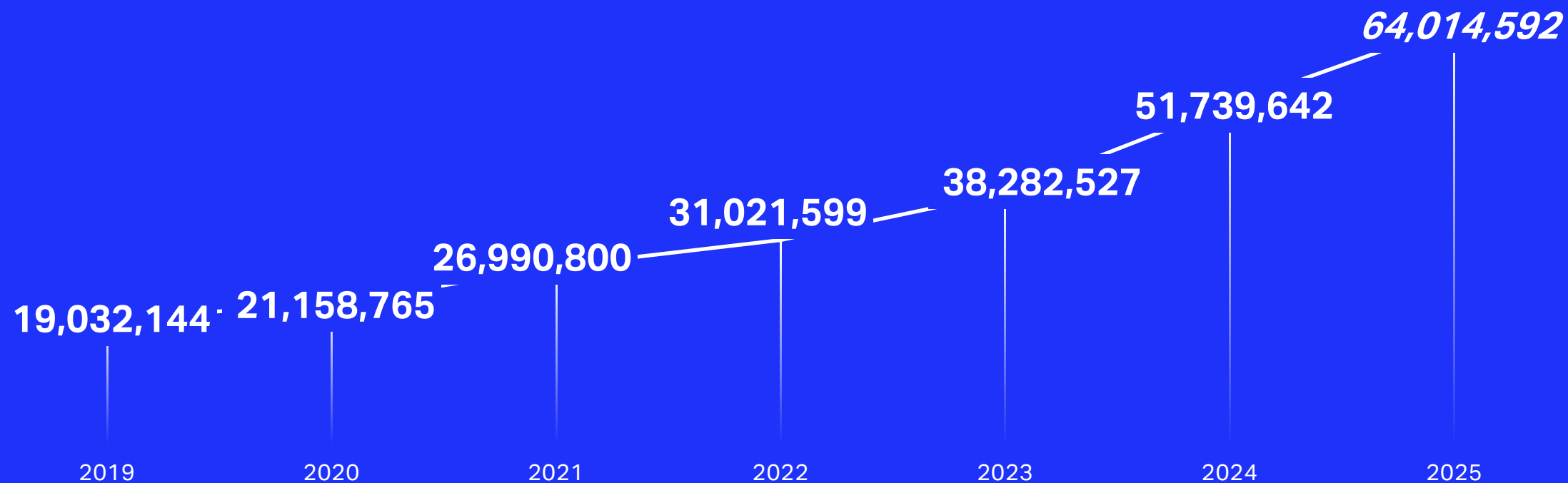


*\*participating airlines in the program*



# Evolution

## NUMBER OF REPORTS



*\*participating airlines in the program*

# Benefits of the program - AUs

Improved safety outcomes

Reduction in turbulence associated costs

Reduction in carbon emissions

Fuel Savings

Grounds to renegotiate insurance

Reduced maintenance costs

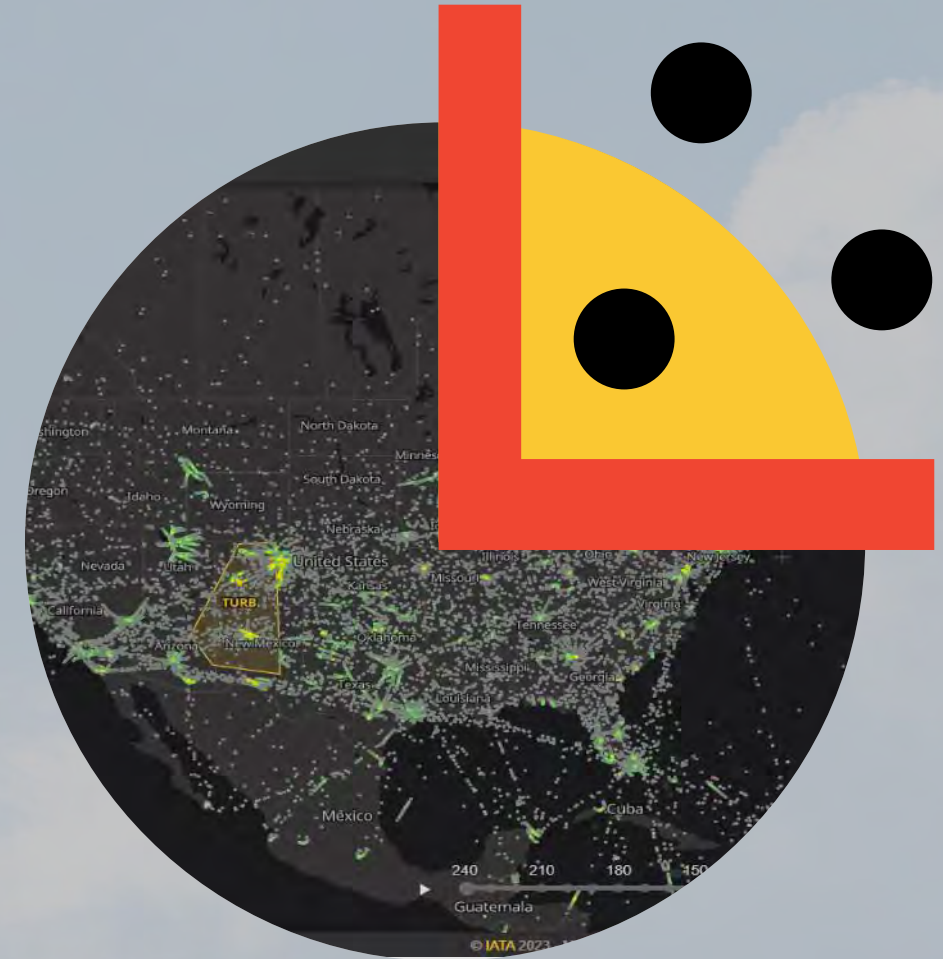
Enhancing brand image

**Joining the Turbulence Aware Program can significantly lower the likelihood of adverse events related to turbulence.**

**The benefits of the TA Program are the foundation of the airline's internal business case.**

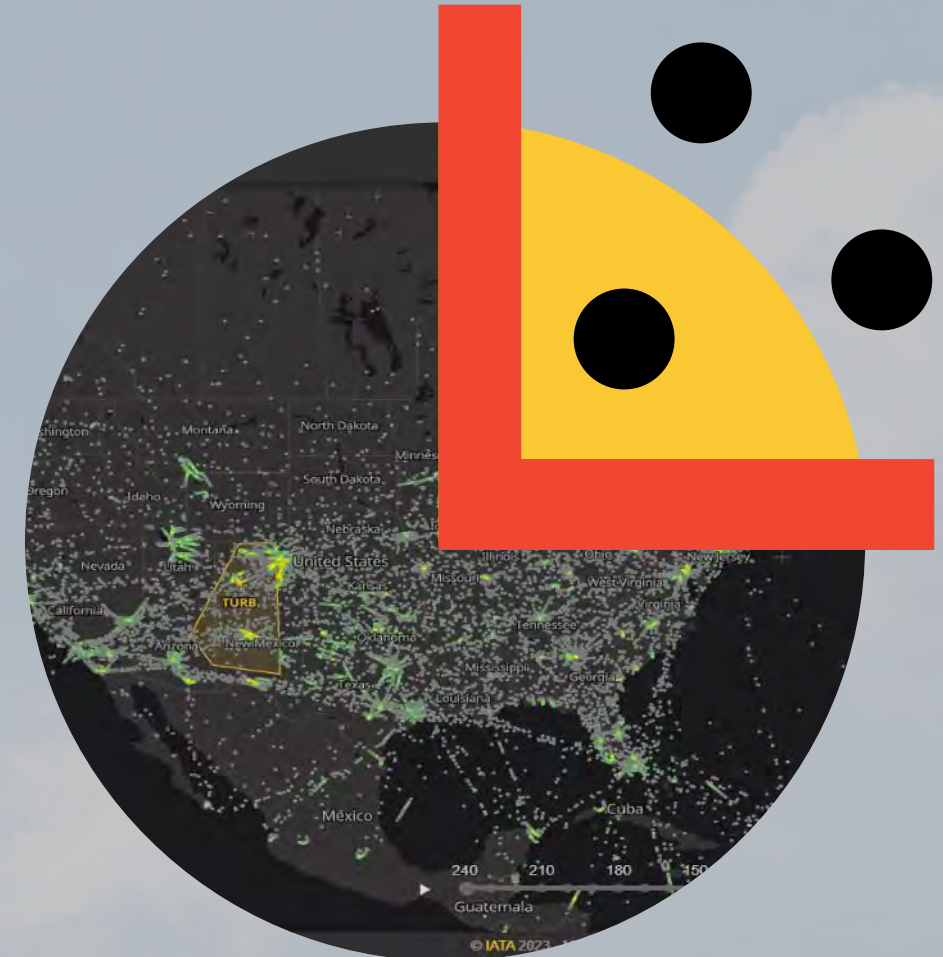
# Use Cases:

- Turbulence and SIGMETs Modeling Validation
- Turbulence Model Development
- Turbulence and Weather Research Activities
- Access to the same raw turbulence data as pilots for better operational decisions
- Analysis of areas / altitudes / flight levels to better manage traffic flow and airways
- ATCs no longer need to congest the airways requesting ride reports



# Use Cases:

- Proactive management of air traffic flow
- Dynamic management of air traffic sectors
- Optimization of airspace usage
- Informed decisions and improved coordination between airlines, ATS and ATFM units
- Enhanced flight planning
- More accurate advisories and warnings
- Cross-FIR coordination during adverse weather



# Thank you!

