OWL

Aviation
Guide

Streamline operations
Prevent runway Incursions
Prevent people/ plant interface
Improve situational awareness
Monitor CO2 emissions

Interested in exploring geofencing solutions for your organisation?

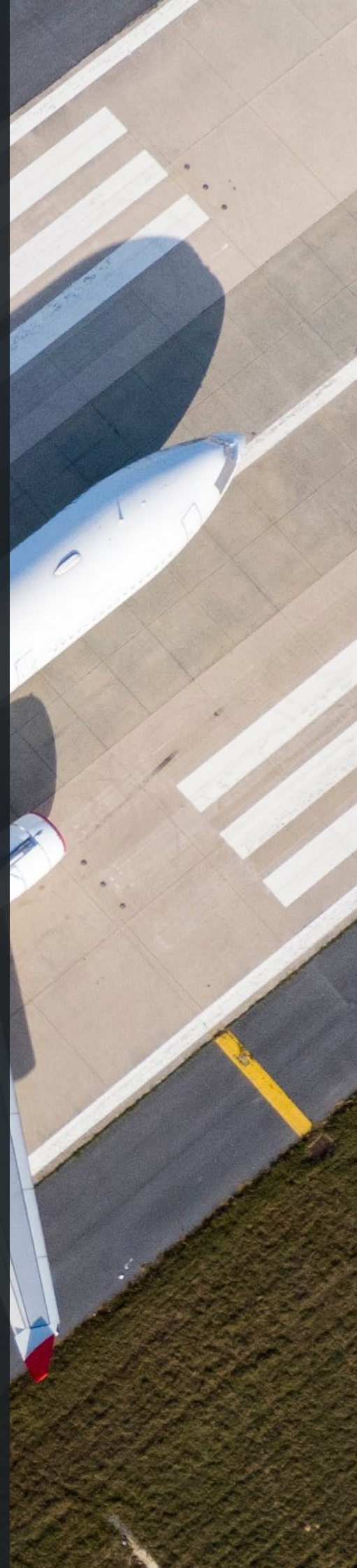**Click to book a demo**

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This guide covers the implementation of geofencing technology across the aviation sector.

We explain the concept of geofencing, the potential benefits that can be gained from its use, and how it can benefit airports.

Contents

Geofencing: an introduction

Geofencing is a technology that allows the creation of a virtual perimeter for a real-world geographic boundary.

When combined with wearable devices or a mobile App, alerts or warnings can be triggered as users enter a geo-fence to enhance the situational awareness of workers and warn them if they're stepping into harm's way.

Traditional geo-location methods relied on technologies like GPS and RFID, for positioning of works and application of geofences.

The ability of these systems is limited and therefore it is a risk deploying these systems at scale or in circumstances where accurate location triggers are required.

Recently, advancements in cellular, IoT and mapping technology have allowed geofences to be created and deployed at scale covering larger and more complex areas and synchronised to more devices.

This combined with enhanced positioning technology using satellite correction data allow low-cost devices to be produced that can be positioned with an accuracy down to less than 10cm, which is vital when considering the safety of workers. These various advancements mean that geofencing technology can be used in a variety of ways across the aviation landscape.

About
Onwave

Onwave, based in the UK is a leading provider of innovative connectivity and digital technology solutions. Onwave offers robust and reliable services to support businesses in achieving seamless communication and operational efficiency.

Specialising in solutions such as managed network services, satellite connectivity, and hybrid wireless technologies, Onwave caters to diverse industries, including construction, events, and critical infrastructure.

The Onwave expertise lies in delivering high-performance, low-latency networks tailored to meet the demands of challenging environments. With a commitment to customer-centric approaches, Onwave ensures secure, scalable, and future-ready solutions, making them a trusted partner for organisations across the UK.

owl   connect   **STARLINK** AUTHORIZED RESELLER

About OWL

OWL was created by Onwave in 2017 to support field teams and enhance visibility of operations.

OWL technology can be deployed globally and set up quickly.

The primary business applications for OWL in Aviation include:

- Prevention of runway incursions
- Prevention on people/ plant interface
- Improving situational awareness
- Monitoring CO_2 emissions
- Streamlining operations to improve turnaround times
- Providing behavioural safety insights
- Better incident response

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Runway Incursions

A runway incursion is defined as

any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft.

In the United States, an average of **1,600** runway incursions occur **annually**.

The runway incursion rate in Canada has risen from an **average rate of 5.3** per 100,000 arrivals and departures in 2010 to **an average of 10.7** in 2021.

The **UK** has on average around **220** runway incursion reports per year.

These are split into four types: runway incursion by an aircraft which accounts for approximately 63%, a vehicle or equipment accounts for 28% and by a person totals around 8%.

■ **Aircraft** approx 63%
■ **Vehicle/ Equipment** 28%
■ **Person** 8%
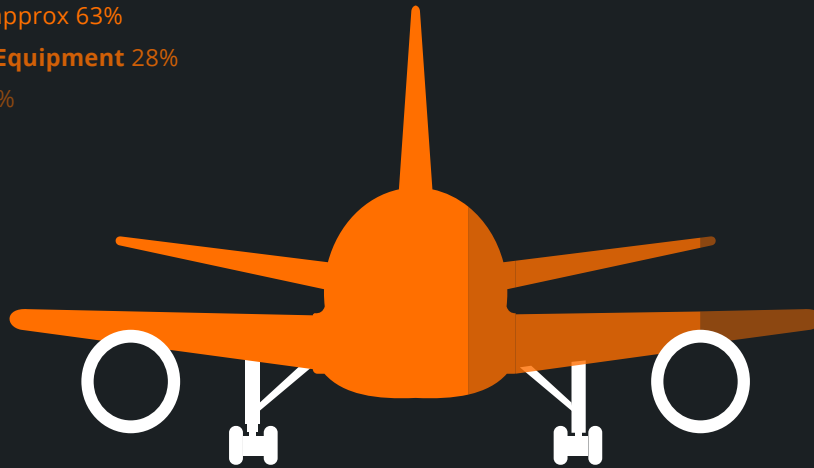
The following table shows incident categories and their descriptions.

Accident	Refer to ICAO definition of an accident
A	A serious incident in which a collision was narrowly avoided
B	An incident in which separation decreases and there is a significant potential for collision which may result in a time critical corrective/ evasive response to avoid collision
C	An incident in which separation decreases and there is a significant potential for collision which may result in a time critical corrective/ evasive response to avoid a collision
D	An incident which meets the definition of a runway incursion such as the incorrect presence of a vehicle/person or aircraft on the protected area of surface designated for the landing and take-off of aircraft but with no immediate safety consequences
E	Insufficient information or inconclusive or conflicting evidence precludes a severity assessment

How OWL helps prevent runway incursions

Our system can be used by airport operations to:

- Track and monitor the location of ground vehicles and personnel in real-time.

- Establish virtual boundaries (geo-fences) around restricted areas, issuing alerts when these boundaries are breached.

- Enhance coordination between ground control and air traffic management to prevent incursions and optimize runway usage.
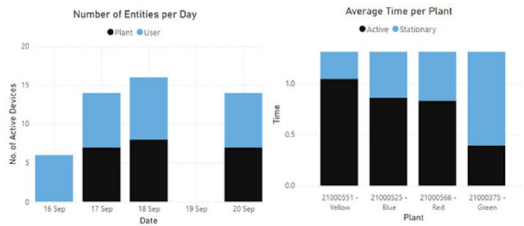
Benefits
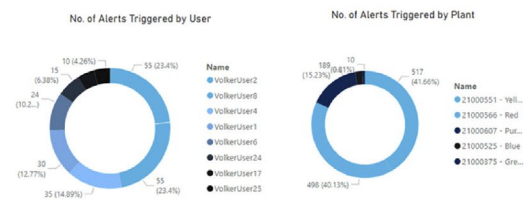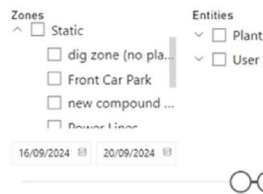
Enhanced safety
Early warnings and automated interventions to avoid runway collisions.

Reduced costs
Fewer delays and operational disruptions.

Scalable
Tailored to airports of all sizes, from regional airports to international hubs.

Situational Awareness

Situational awareness is key to keeping ground operations safe and has a big impact on overall safety.

It comes from using your senses to observe what's happening around you and matching that to your mental picture of the situation. Good planning, clear communication, coordination for upcoming flight phases, setting goals, and getting feedback all play an important role in staying aware and making good decisions.

However, things like inattention, distractions, inexperience, over-familiarity and heavy workloads can make it much harder to maintain situational awareness.

OWL for improving Situational Awareness

OWL will alert people if they step outside of their safe working area.

- This data provides insights enabling you to make safety interventions if unsafe patterns of behaviour are identified.

- OWL can also be used to identify issues with site layout and be used to make informed decisions about site layout and changes.

People/plant interface

The interaction between people and vehicles is recognised as a significant risk, often leading to serious accidents and fatalities.

The most common causes of injuries involve:

- Heavy equipment and vehicles
- Falling or flying objects, such as tools and debris
- Revolving machinery, including cranes, backhoes, and drilling/piling rigs
- Moving trucks and vehicles on site

Prioritising safety measures in these areas is essential to prevent accidents and protect everyone on site.

The Flight Safety Foundation stats state that between **2017** and **2023** there were **54** ground fatalities across the aviation sector.

OWL to Reduce the risk of people/plant interface

Dynamic Exclusion Zones

Reduce the risk of people stepping too close to dangerous equipment and machinery with dynamic exclusion zones around plant equipment.

Create Alerts for High-risk areas

Create alerts based on high-risk areas on site and ensure that safe walking routes are being always adhered to with alerts for zones created in a few minutes.

Airside Alerts

When exclusion zones are set up, our geofencing wearables will alert airside workers if they step into these zones, and into the vicinity of potential hazards. The devices have three alert types, sound/audible, flash/strobe, and vibration/haptic making them appropriate for airside use.
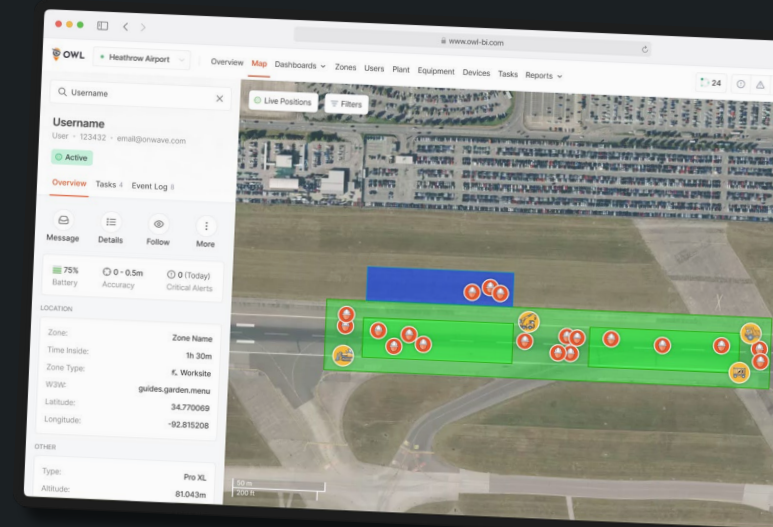
Help prevent accidents and collisions

Owl will help to prevent apron and taxiway accidents and collisions with equipment, machinery, and vehicles through the multi-alert function.

Record data

All near-misses will be automatically recorded giving greater clarity on areas for safety improvements.

Visible locations

The wearable devices can be used to ensure any third-party contractors and teams' locations are visible when working and they will have enhanced situational awareness of hazards and restricted areas to keep them safe, particularly if there is a new work site for a contractor and they lack locational familiarity.

Streamlined
Operations

Studies indicate that proper resource management using real-time monitoring can improve turnaround times **by up to 15%**, which translates into significant cost savings and enhanced operational capacity for airports.

OWL for streamlined operations

Driving Efficiency in Airport Operations

Beyond Safety, OWL can significantly enhance the efficiency of daily airport operations, contributing to quicker turnaround times, improved resource management, and streamlined logistics.

Data-Driven Operations

The powerful data insights generated by OWL provides airport management teams with valuable metrics, such as equipment usage rates, worker movement patterns, and operational bottlenecks. These insights can help identify inefficiencies and inform long-term decision-making for continuous operational improvement.

Efficient Resource Allocation

Having a live view of the location of vehicles, personnel, and machinery on the airfield allows airport operators to assign resources more effectively, avoiding delays caused by misplaced equipment or unavailable staff. This real-time insight also reduces fuel consumption by preventing unnecessary movements of ground support vehicles.

Optimising Aircraft Turnaround Times

OWL allows real-time tracking of service vehicles, cargo dollies and ground support equipment. For example, locating the nearest empty cargo dolly can shave valuable minutes off aircraft loading times, reducing delays and helping to maintain tight flight schedules. With turnaround time directly linked to operational efficiency, these small improvements can have a substantial impact on both airline satisfaction and airport profitability.

OWL for monitoring CO2 emissions

Reduce Equipment Idle Time

Monitor idle time by detecting movement and vibration.

Create Dashboards

Create intuitive dashboards to easily identify unproductive equipment

Collect Data

Incorporate CO_2 emissions data to assess the carbon impact.

Understand and report on actual CO2 emissions and not estimated emissions.

Useful links and resources

Click on the links below

- Runway Safety Statistics

- Runway Incursion | SKYbrary Aviation Safety

- GRSAP_Final_Edition02_2024-02-19.pdf

- Aviation Safety Network Aviation Safety Network

- CAA Civil Aviation Authority

- ICAO About ICAO

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