



CASE STUDY

UAS FLIGHT DATA: ORLANDO, FLORIDA & CAMPING WORLD STADIUM



INTRODUCTION

AirSight Case Study: UAS activity in Orlando, FL

In this case study, **AirSight** focuses on unmanned aircraft system (UAS) data collected in Orlando, Florida. Our expert team analyzes UAS data collected at Orlando International Airport and three major sporting events at Camping World Stadium.

Problem: Unauthorized drones putting your security at risk.

UAS, or drones, can pose significant security risks to airports, stadiums, and the general public. The best way to determine the frequency of drone sightings is to monitor your airspace with drone detection technology. During the evaluation period, security teams will gain access to accurate and reliable data to assess the issue and decide how drone detection should fit in your overall security plan. Knowing what is happening in the airspace is crucial to preventing and responding to drone threats.

Solution: Understanding your airspace is key.

To evaluate the locations in Orlando, Florida, we installed Air Guard. AirGuard is a comprehensive drone detection platform that goes beyond detection and gives organizations actionable data to address airspace security and achieve enhanced situational awareness.

ORLANDO INTERNATIONAL AIRPORT

AirSight: UAS Activity in Orlando

An analysis of UAS activity conducted in proximity to Orlando International Airport was conducted for the entire period that the sensor has been in operation, December 19, 2019 until March 7, 2020, at 00:00 EST.

The assessment team deployed Airsight's proprietary AirGuard System, a detection solution that identifies and tracks UAS platforms using communication signals.

AirGuard UAS Detection System

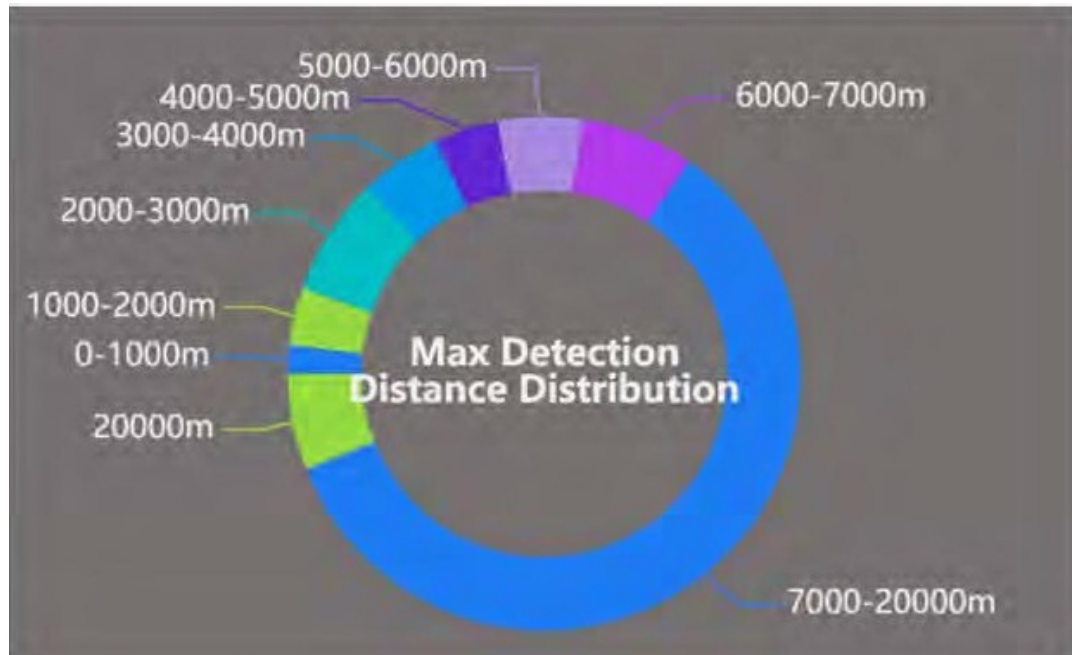
During the assessment period, 9,500 separate UAS operations were detected. Separate operations were assessed based on operating location, UAS electronic ID, timing, and continuous tracking. When appropriate, data was consolidated to avoid reporting duplications of the same flight activity.



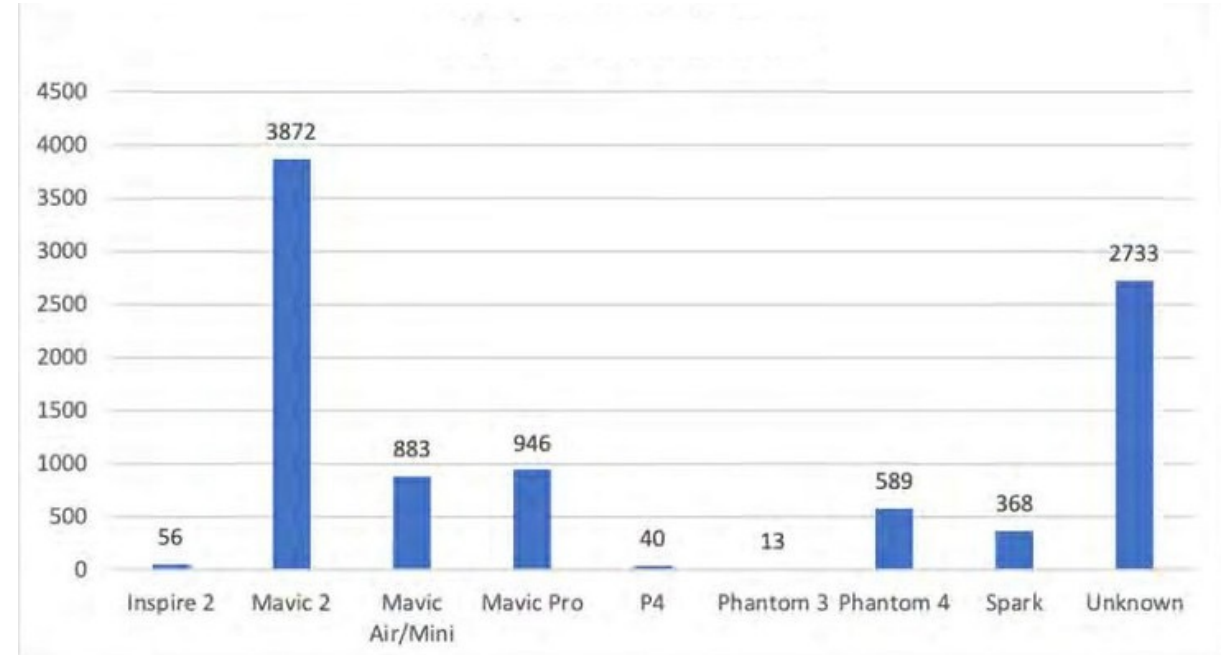
Airsight's proprietary
AirGuard UAS Detection System

OUR EVALUATION

Distribution of UAS operations by distance from Orlando International Airport (plotted in meters; Ordered in ascending distance).

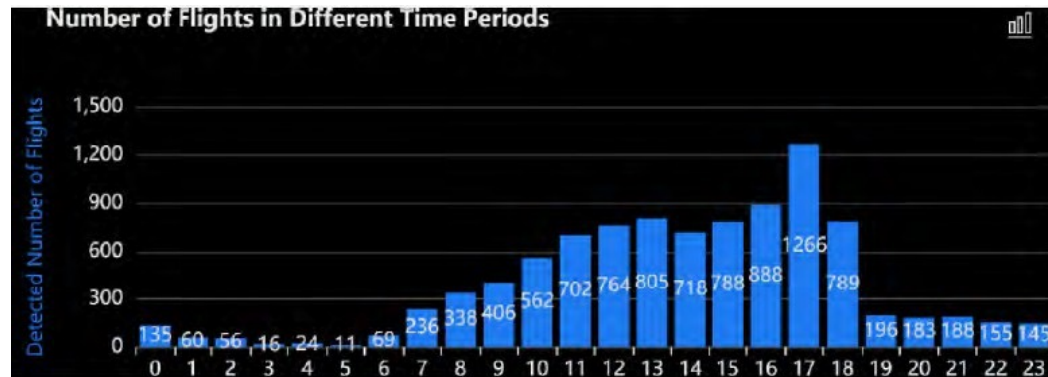


Detections ranged in distance from 0.3 NM to a maximum of 18.5 NM from the AirGuard sensor.



OUR EVALUATION

Distribution of UAS operations by time of day



Calculated Sunrise / Sunset / Civil Twilight for Orlando International Airport, February 9, 2020

Event	Time
Civil Twilight Began	6:43am EST (11:43 UTC)
Sunrise	7:07am EST (12:07 UTC)
Sunset	6:11pm EST (23:11 UTC)
Civil Twilight Ended	6:36pm EST (23:36 UTC)

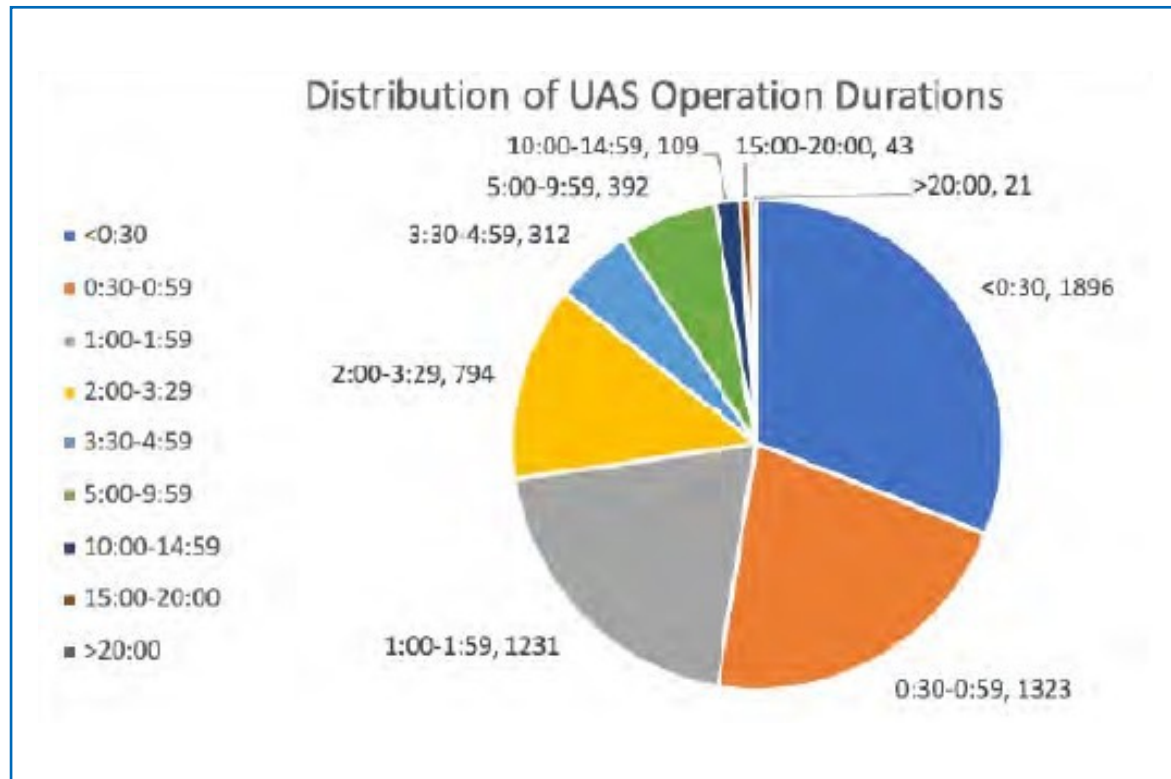
8,262 of the 9500 UAS operations (86.9%) were conducted during daylight hours, with 1,238 operations being conducted outside of daylight hours – either before or after civil twilight (see Figure 4). Sunrise, sunset, and civil twilight data was derived from the FAA AVCAMS calculator.

February 9th was chosen as the sample sunrise/sunset time because it is the average sunrise/sunset time for the detection period.

OUR EVALUATION

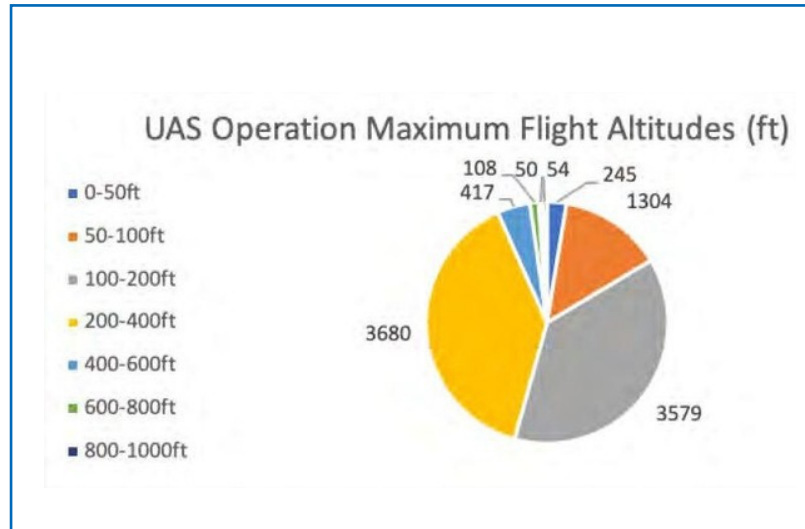
Distribution of UAS operations by flight duration

February 9th was chosen as the sample sunrise/sunset time because it is the average sunrise/sunset time for the detection period.



CAMPING WORLD STADIUM

Distribution of UAS operations by flight duration



Flight detection data was assessed to determine the maximum flight altitude for each UAS operation. Flight altitude was measured in meters above the UAS launch point. Altitudes were converted to feet to simplify compliance assessment. In most circumstances, these values can be interpreted as above ground level (AGL), unless the UAS launch was carried out from an elevated structure.

UAS detections ranged from a minimum altitude of 0 ft AGL to a maximum altitude of 1640 ft AGL. The mean flight altitude of UAS operations was 221.2 ft AGL, with the median flight altitude being 187 ft AGL. 8871 (93.3%) of the 9500 detected UAS operations were carried out below 400 feet AGL; 576 (6%) were operated between 400 and 1,000 ft AGL; and the remainder were flown above 1,000 ft AGL.

Assessment

Estimated Annual UAS Activity: The sampling period is representative of seasonal UAS activity; the assessment team estimates that the area surrounding Orlando International Airport likely experiences an estimated 41,436 UAS operations on an annual basis.

UAS Operational Observations: Several UAS operations were near the airport and/or in the path of flights. Most activity is concentrated near Orlando's population center.

OUR EVALUATION

Distribution of UAS operations by flight duration

AirSight proudly supported Camping World Stadium with airspace security during three major sporting events which included two college football bowl games and the NFL Pro Bowl.

Sporting venues and stadiums are becoming more aware of the issues and risks that drones pose to public safety. Few incidents have made headlines like the one involving Tracy Mapes, whom used his drone to drop anti-media leaflets over two NFL stadiums - Levi's Stadium and Oakland-Alameda County Stadium. This prompted many security professionals to consider drones as threats and deploy drone detection for enhanced airspace security especially during high attendance, high profile events such as bowl games.

UAS FLIGHT DATA

In this case study, we are looking into the data collected from AirGuard, AirSight's drone detection system, installed at Camping World Stadium in Orlando, Florida. AirSight deployed AirGuard at the stadium in early December 2019 prior to the bowl games. Through the use of RF sensors, AirGuard is able to detect and track a wide variety of drone models/ brands in real-time.

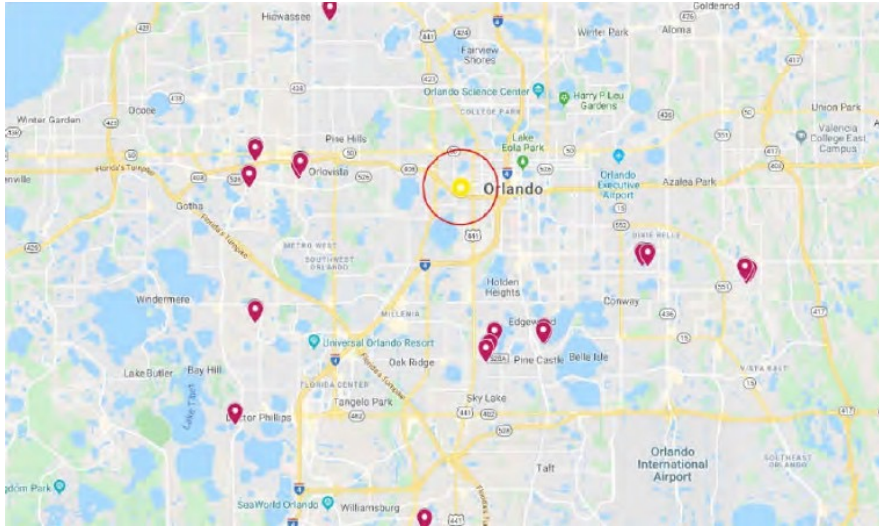
3 MAJOR SPORTING EVENTS

We analyzed drone data captured on game days for three major sporting events in Orlando, FL.

Game	Date	Attendance
Game 01 CAMPING WORLD BOWL GAME	12/28/19	46,498
Game 02 CITRUS BOWL	01/01/20	59,746
Game 03 NFL PRO BOWL	01/26/20	54,024

CAMPING WORLD BOWL

December 28, 2019: UAS flight data during the Camping World Bowl



No drone flights occurred within the 1-mile perimeter during the Camping World Bowl game on December 28, 2019. On game day, the closest drone detected was flying 4.62 miles east of Camping World Stadium.

However, from the time **AirGuard** was installed on December 9, 2019 leading up to the game, 20 UAS flights were detected within the 1-mile airspace perimeter around the stadium. Of those 20 flights, 13 unique drone IDs were identified – meaning 13 different drones flew within the perimeter.

Game Day Report

42

Detected flights

0

Detected within
1 - mile of perimeter

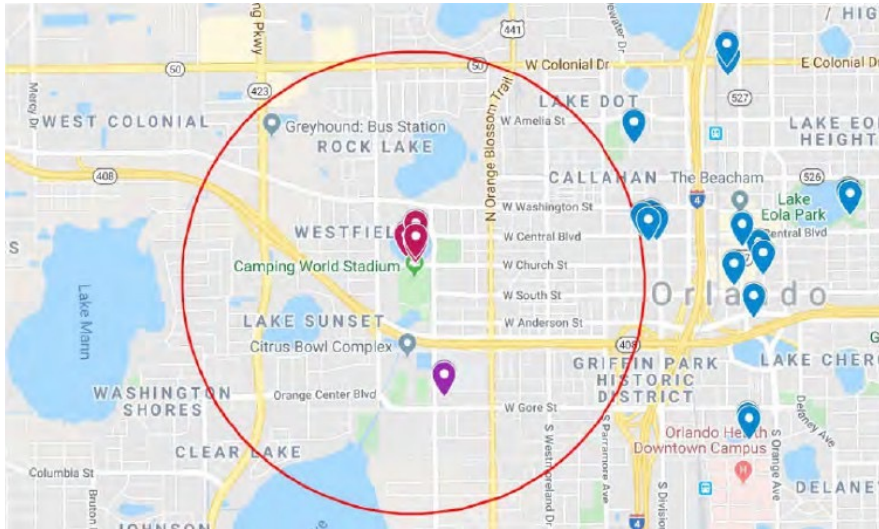
Closest
detected
flight

4.62

miles east of stadium

CAMPING WORLD BOWL

December 28, 2019: UAS flight data during the Camping World Bowl



The Citrus Bowl took place on Wednesday, January 1, 2020, at Camping World Stadium in Orlando, FL.

Observed weather was partly cloudy with no rain for most of the day. Kickoff time was 1:00 EST.

Game Day Report

135

Detected flights

9

Detected within
1 - mile of perimeter



8

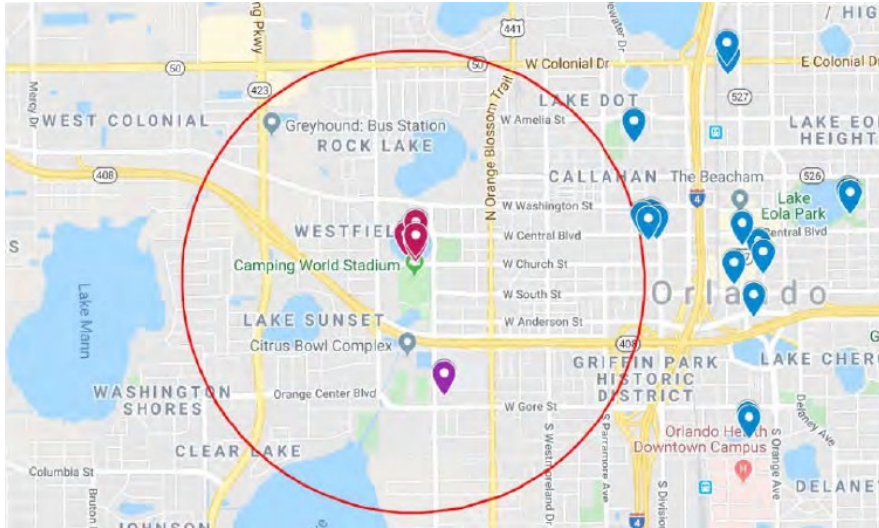
Were reapproved ESPN
Drones (Blue Markers)

1

Unauthorized drone was detected (purple
marker) , flight occurred at 3 : 5 7 EST and
lasted approximately 6 minutes

NFL PRO BOWL

January 26, 2020: UAS flight data during the NFL Pro Bowl



Two (2) drones were pre-approved by Camping World Stadium for flights inside the 1-Mile perimeter and .5 Mile TFR.

Both drones were operated by Premier Drone Productions and were gathering aerial footage on behalf of the City of Orlando for a traffic study.

There were two (2) drones that flew inside the 1-Mile Perimeter and .5-Mile TR that did not have approval.

Game Day Report

56

Detected within
1 - mile of perimeter

Unique
IDs:

4

28

5 - mile TFR detected flights

Unique
IDs:

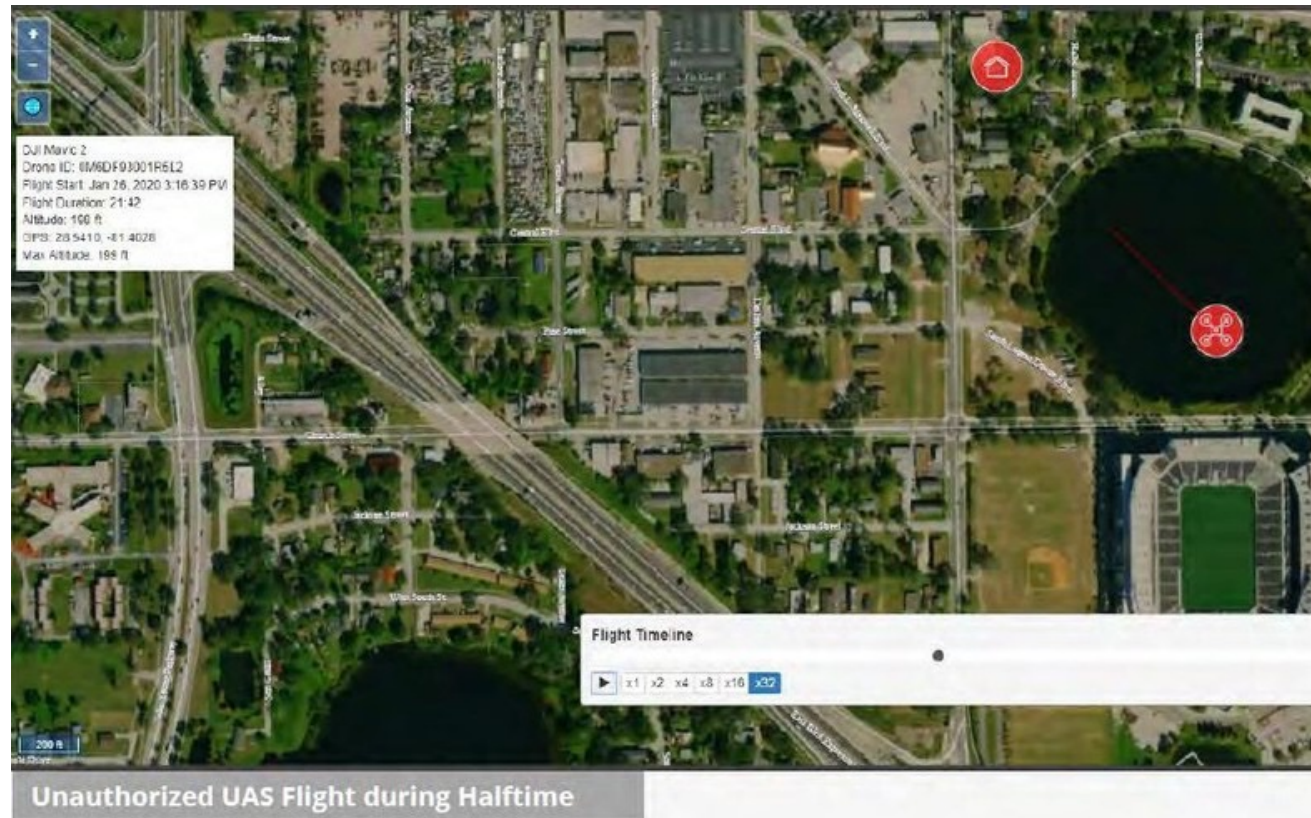
5

Types of Drones detected:

Phantom 4 Pro V2.0 (2)
MAVIC 2 (1)
M200 (1)

NFL PRO BOWL

January 26, 2020: UAS flight data during the NFL Pro Bowl

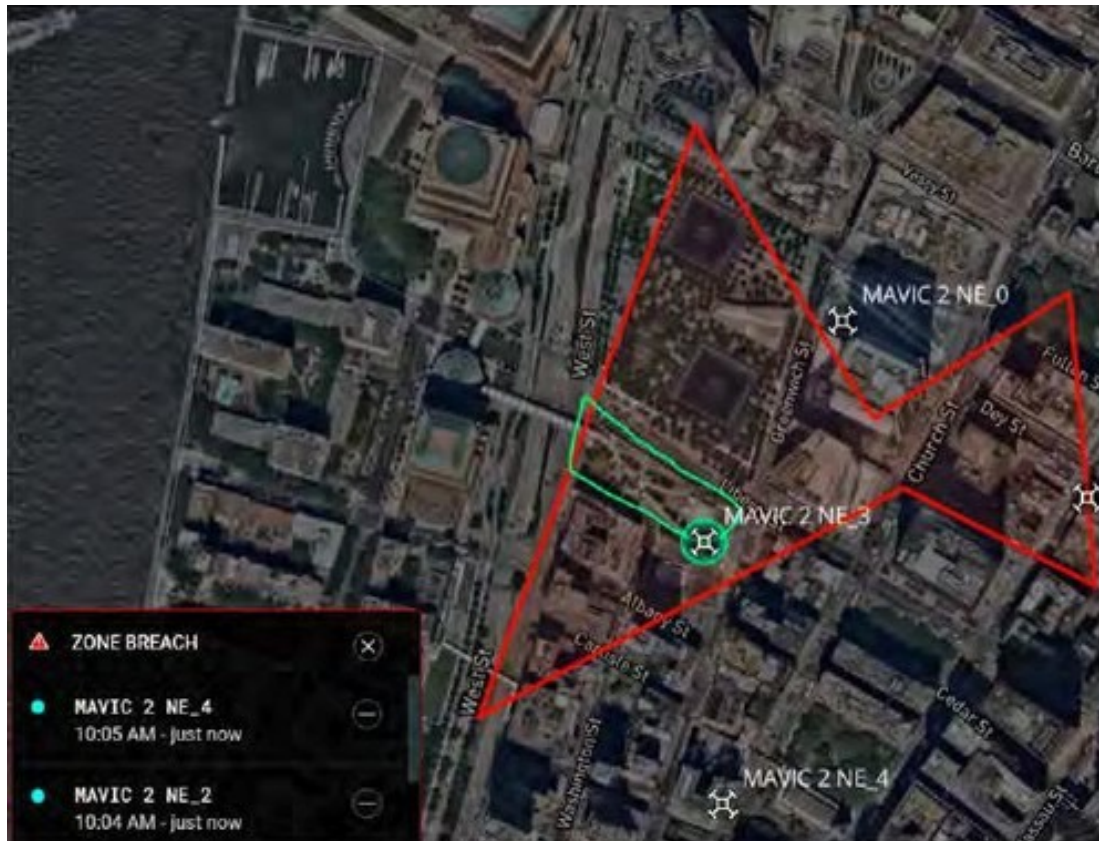


The first drone (ID OM6D93001 R5L2) flew twice. The first flight was before kickoff at approximately 10: 25EST and lasting 15 minutes, and the second flight was during halftime at approximately 15:20EST and lasting 18 minutes. Both flights originated from the corner of Washington Street and Tampa Avenue, which just North West of the stadium. OPD spoke with the pilot after the last flight and stated that he was unaware of the TR.

The second drone (ID 095XE9X00201 FZ) flew once. At approximately 9: 50EST, the drone took flight from Lake Lorna Dune Park. The flight lasted approximately 2 minutes.

UAS DATA OBSERVATIONS

Camping World Stadium



Unique Drone IDs:

We observed during these games was that a small number of unique IDs flew most of the flights. Examining the NFL Pro Bowl UAS data further, we see that four drones were responsible for 56 flights made within the 1-mile perimeter on game day.

Since our system can whitelist authorized flights, we saw that two of those drones were previously whitelisted. The whitelisted drones were being flown for the City of Orlando.

Pilot Position:

During the NFL Pro Bowl, two unauthorized drones were responsible for three of the flights made during the game. AirGuard can pinpoint pilot and drone locations. By locating the pilot position, the Orlando Police Department was able to find the pilot and access the situation to see if any action needed to be taken.

UAS DATA OBSERVATIONS

AirGuard's 4 Steps to Secure your Airspace



AirGuard, AirSight's drone detection solution, gives security teams and law enforcement enhanced situational awareness. Knowing what is happening in the airspace is crucial to preventing and responding to drone threats. Our comprehensive drone detection platform allows security officials to respond to threats as soon as they happen.

AirGuard Integrates with electronic drone detection technologies like Radio Frequency (RF) sensors and high-resolution drone radars to detect drones and pilot locations providing security personnel with critical information like drone ID, make/model, payload capacity, and real-time GPS location for both the drone and pilot. AirGuard integrates data from multiple sources via APIs from systems such as existing security systems which allows security personnel to manage their airspace in one easy to use interface.