ARISE

Aerial Robotics in STEM Education

ARISE

DRONES IN THE CLASSROOM

AERIAL ROBOTICS IN STEM EDUCATION (ARISE)

ARISE Drone Design Competition

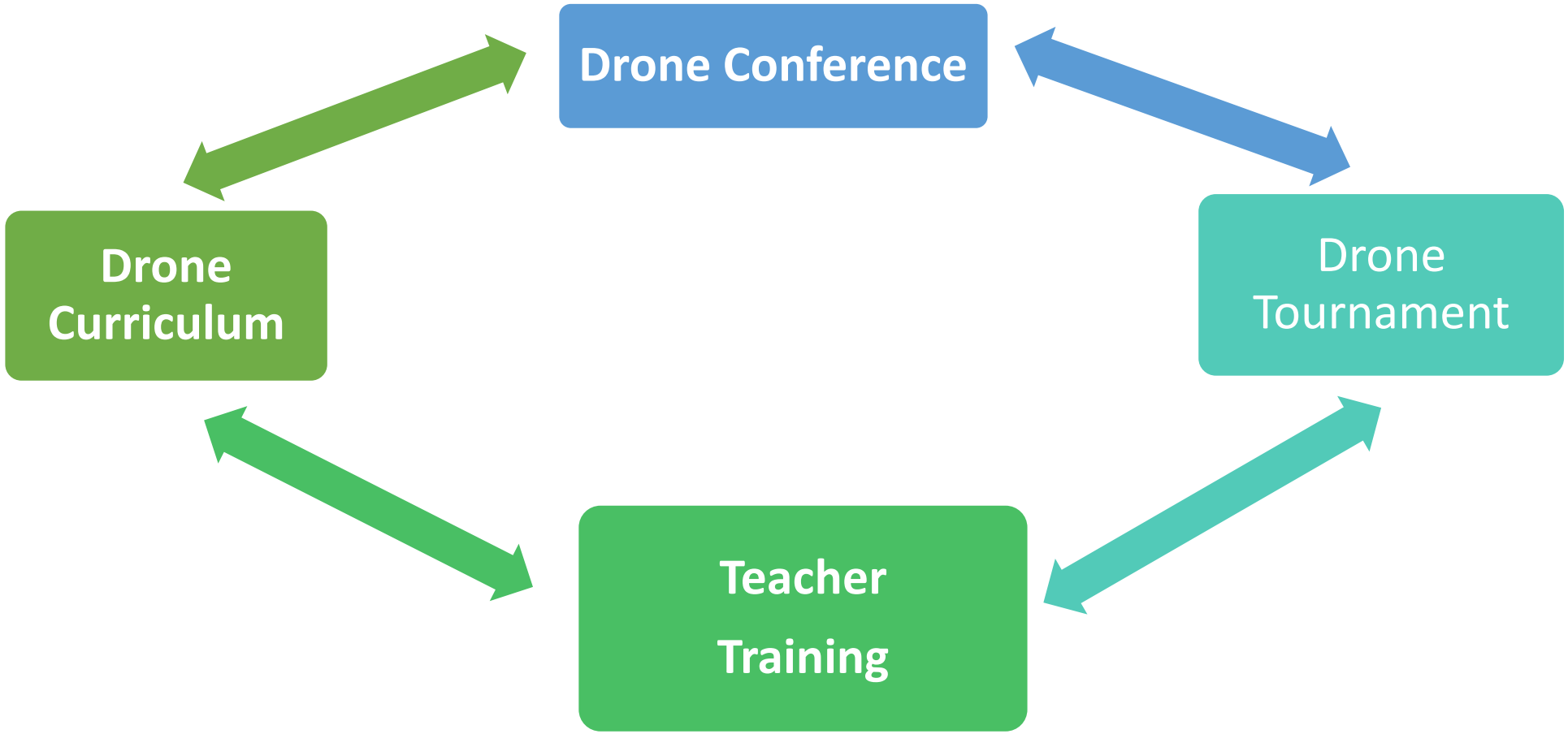
Kenneth Berry
Research Professor
Southern Methodist University

ARISE Drone

- ARISE Drone is organization created by teachers for teachers and students
- Engineering Design Competition connected to an Engineering Capstone Course
- Studying drones provides valuable applications for science, technology, engineering and math content
- Critical Industry skills can be taught with drones like creativity, critical thinking, communication, and cooperation
- Competition should be part of the school day and part of a teacher's full-time job, not just an afterschool activity
- We believe that school should be fun, exciting, challenging, social and relevant

ARISE Drone

What we Do:


Drone Conference
Drone Curriculum
Drone Tournament
Teacher Training

Full Year of Activities

- Summer (June): Teacher Training on Drone Curriculum and Drone Competition
- Fall (August) Conference and Kickoff Event
- Teaching the curriculum with buy and fly drones
- Design a drone for competition in the spring: April 26, 2024

Capstone Engineering Curriculum

- Full year
  - Fall: Content heavy basics
    - Drone safety, Drone Flight, aerodynamics, forces and motion
    - Certifications in TRUST, Part 107, Technician License
  - Spring: Skills and application heavy
    - Students specialize: Mechanical, electrical, chassis, attachments, marketing, strategy
    - All learn project skills: project management, teamwork, budgeting, leadership, design process

Drone Competitions

- Buy and fly competitions
  - REC Competition
  - Skills USA Competition
  - Drone Soccer
- Drone Design Competitions
  - Bell Vertical Robotics Competition
  - ARISE Drone Design Challenge
  - AUVSI sUAS Competition

ARISE Drone Challenge

- 4 Components
  - Line-of-Sight radio-controlled challenge
  - Autonomous control challenge
  - Engineering Design Notebook
  - Presentation on Project Management Process
- Authentic tasks
  - Outdoors so drone can use all its sensors
  - Open-source Pixhawk controllers
  - Open-source ground control for autonomous flight: Q-Ground Control, ArduPilot
  - Robust 25 lbs. platform to complete tasks

Support

- Ideas for competitions
- Help us stay current with industry applications: Half Industries, Wing, Zipline
- Drone platforms: Pitsco
- Better technology: onboard microprocessor, application of RTK
- Need Volunteers: plan the games, advisors, judges, support at the competition, and videos of what you do

Benefit

- Students become excited about the Drone Industry
- Energize the volunteers
- Smart kids have great ideas to improve industry processes and innovate outside the box
- Cultivate Potential employees
- Improve the education system

ARISE

Aerial Robotics in STEM Education

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ksberry@SMU.edu

Pitsco Education Drone Continuum

David Meador, Drone Learning Specialist

Matt Frankenbery, Vice President of Education

OUR MISSION:

Leading education that positively affects learners

OUR IMPACT

More than
160 MILLION
students served
since 1992

Since 2005, we have provided curriculum professional development for **7,800+** educators.

3 Currently serving
MILLION learners
with product shipped annually

44% of our customers have been customers since **2000 or before!**

1,016
different careers to explore within our curriculum

3,000+
Products

OUR GOAL

To make it easy for educators to bring these materials to the learning environment to create lifelong learners, successful professionals, and engaged citizens.

We promise to remove barriers, to bring cutting-edge education technology to all children, and to help educators find new, relevant ways to do what they do best.

LIFELONG LEARNERS

SUCCESSFUL PROFESSIONALS

ENGAGED CITIZENS

Grades 3-14 Drone Continuum

- Offering developmentally-appropriate options for students in Grades 3 through 14

Pitsco Drone Continuum

- SkillsUSA National Competition
- Post-Secondary
- High School
- Middle School
- Elementary School

Drone Continuum – SkillsUSA

- Four Competition Tasks
- Task 1: Flight Skills
- Task 2: sUAS Maintenance Troubleshooting and Repair
- Task 3: FAA Knowledge Test
- Task 4: Autonomous Flight

Drone Continuum – RTC Model

- Regional Training Center
- Post-Secondary

Drone Continuum – High School

- Part 107 Certification
- 40-hour curriculum
- 150-hour curriculum

Drone Continuum – Echo Drone

- Ready to Fly Drone
- Echo Drone
- Replacement for Tello
- Section 889 compliant

Drone Continuum – Drone Maker Kit

- Grades 3-8
- Drone Maker Kit
- Awarded Best of STEM – 2023

Drone Continuum – Drone Maker Kit

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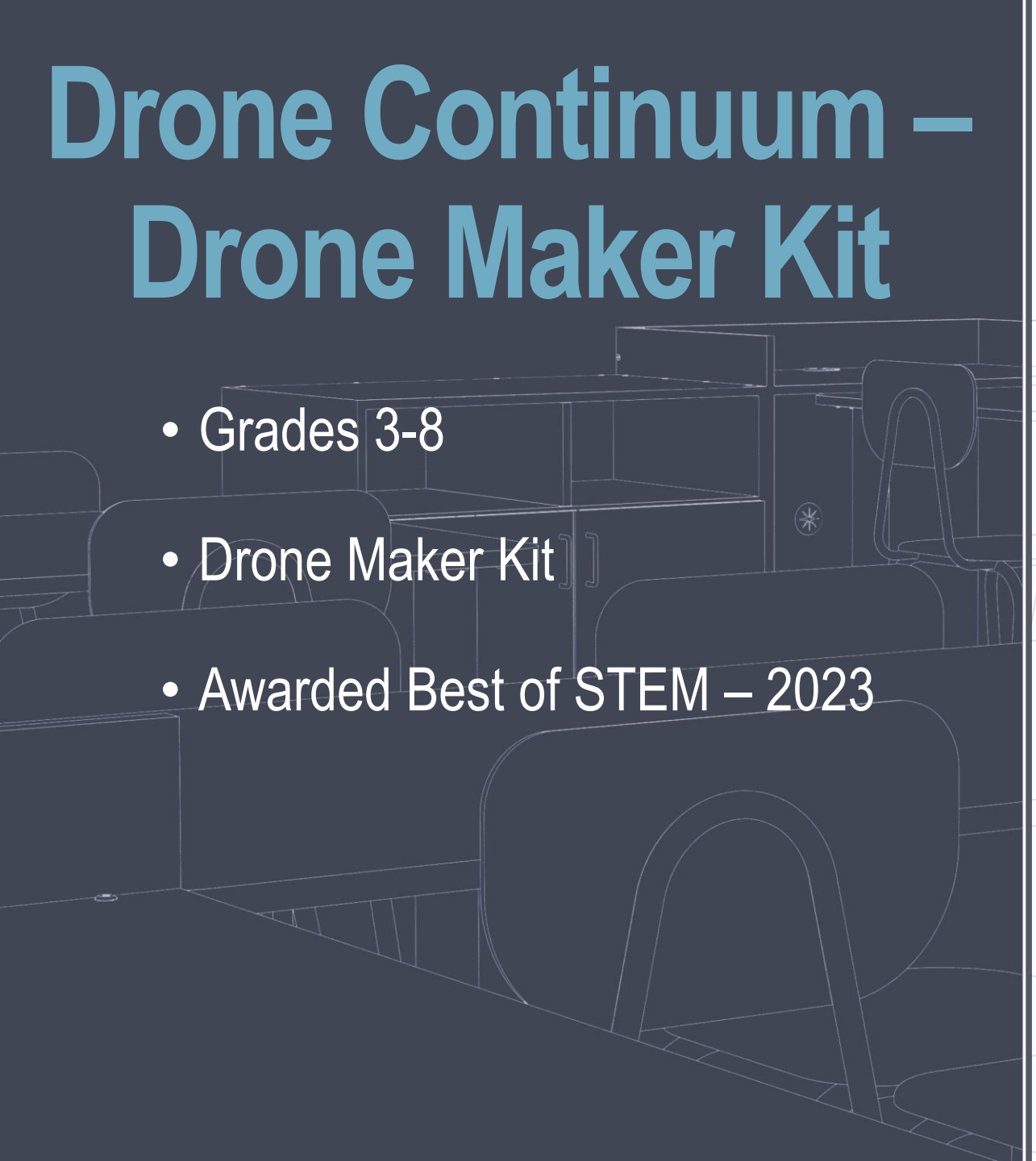

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Pitsco Drone Continuum

- Sneak peek of the future

Pitsco Drone Continuum

Questions?

Contact Information

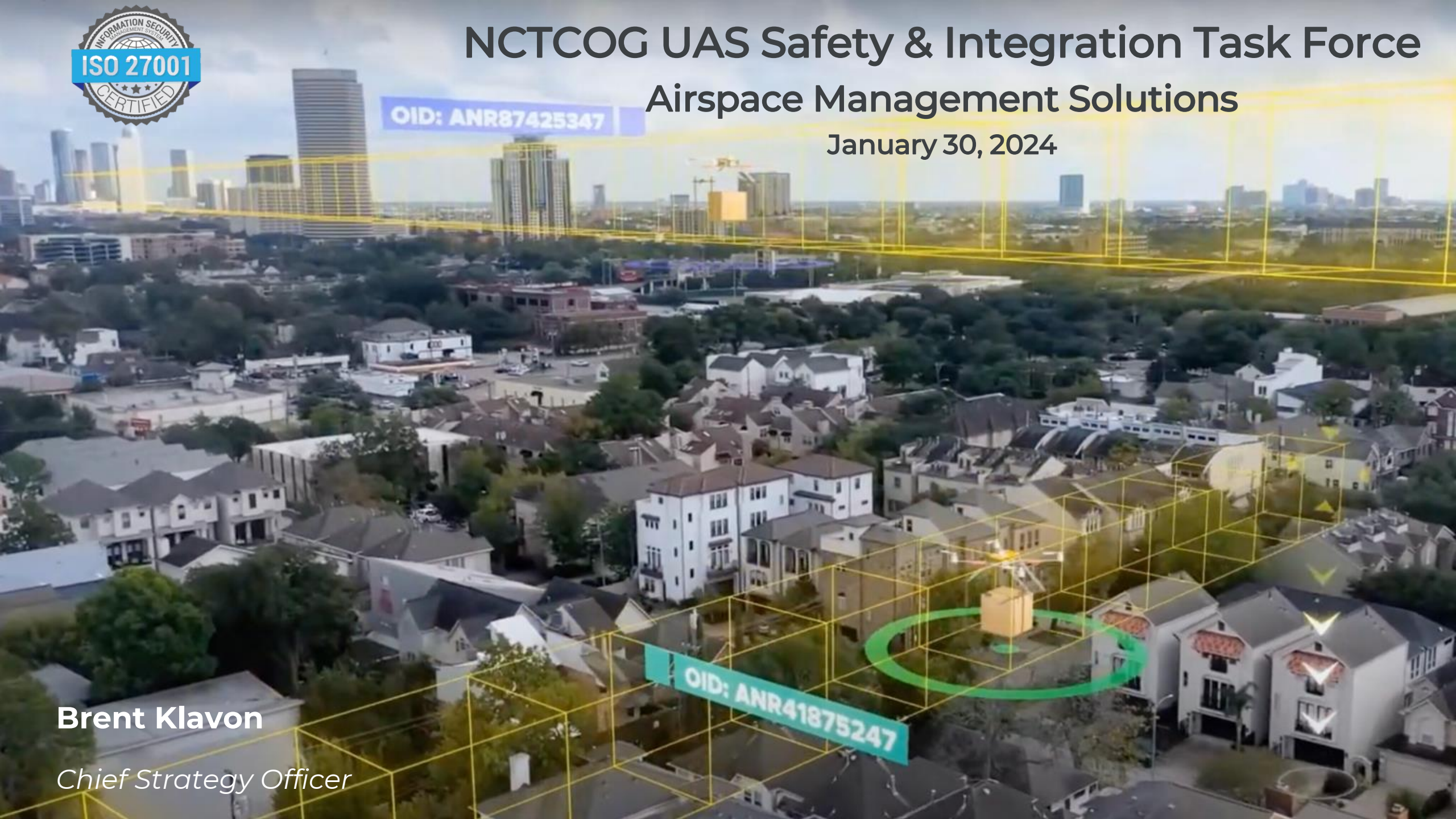
David Meador, Drone Learning Specialist: dmeador@pitsco.com

Matt Frankenbery, Vice President of Education: mfrankenbery@pitsco.com

NCTCOG UAS Safety & Integration Task Force

Airspace Management Solutions

January 30, 2024



Brent Klavon

Chief Strategy Officer

- Since 2015, digital airspace and mission management solutions
- Modular services that evolve with standards and regulatory environment
- Multimodal and Mission Management solutions with value-added services
- Fortune 50 Enterprises, US DOD, NASA, FAA, EASA, UK-DASA, EU Space Agency, AU CASA, Swiss FOCA, DGCA, UK CAA, SESAR, South Korea
- ISO 27001 Certified for Information Security Management Systems
- Offices Washington DC, London, Asia, and Europe

ANRA Technologies Engagements

Future Complementary Service Environments

UTM, UAM, U-space
LAANC
Remote ID
DSS/CIS
Single Integrated Operating Picture (SIOP)

Airspace Management

Surveillance Fusion
3rd Party Date Integration
Simulation/Digital Twin
SORA

Data Services

Mission Manager X
Drone-in-a-Box
Delivery Management
Operations Center
Vertiport Management

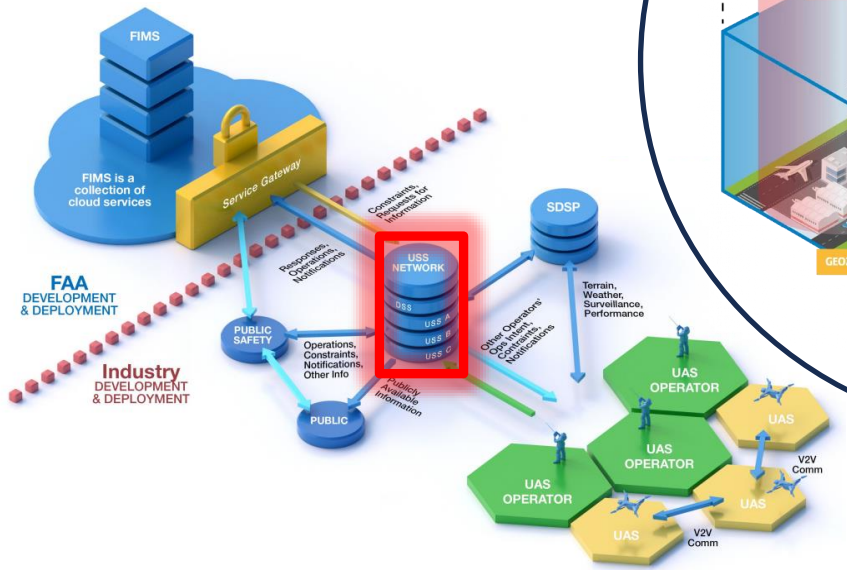
Enterprise

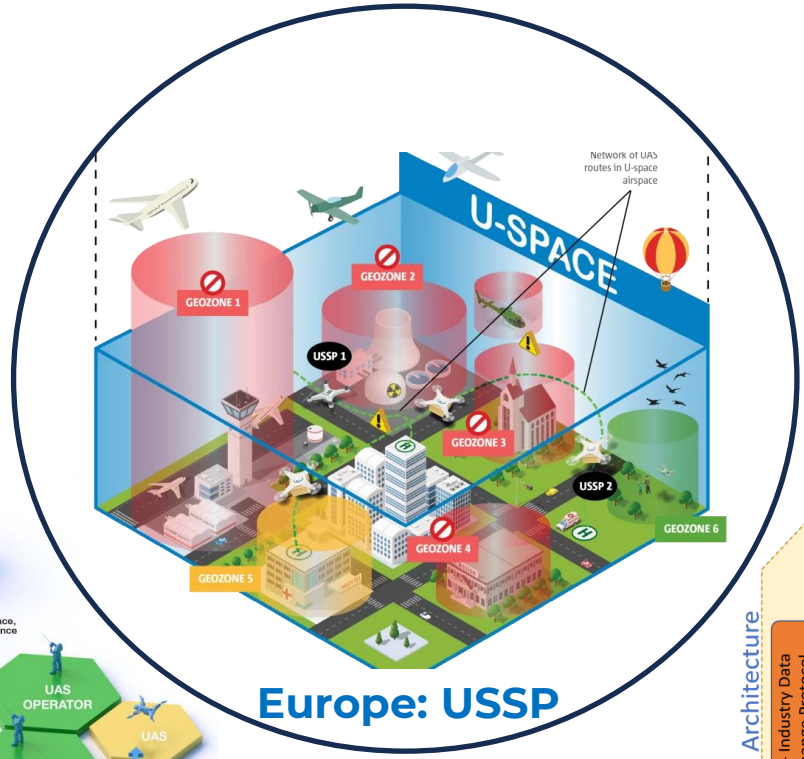
ANRA's Airspace Management Involvement

UTM **AAM** **UAM**

USS

LAANC

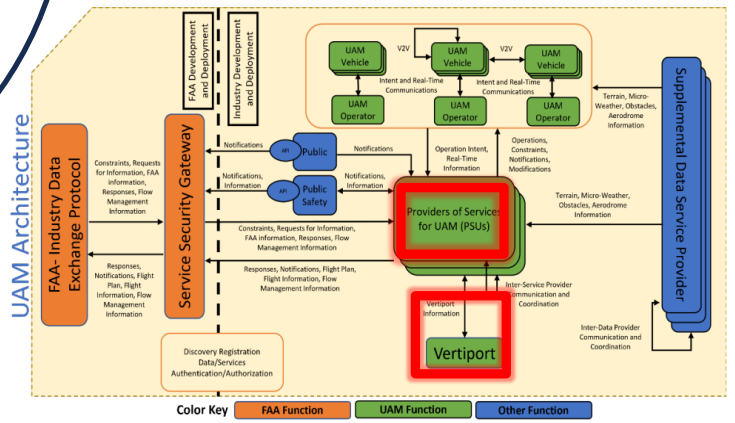




Europe: USSP

PSU

Vertiport Management



Standards **Technology** **Policy**

Mission Management X

ANRA Mission Manager X

- Manage all drone equipment & pilots
- LAANC
- Enterprise integration (e.g., Maximo, Splunk, GIS)
- Remote ID display
- Live video and live telemetry
- Integrated ~90% of COTS drones
- Custom Geozones
- NOTAMs, Airspace Classifications, Weather, and more

Aligns with FAA airspace roadmap

Optional

- Civ-TAK
- Surveillance (radar, C-UAS, optical, etc.)
- ADS-B
- Drone-in-a-Box

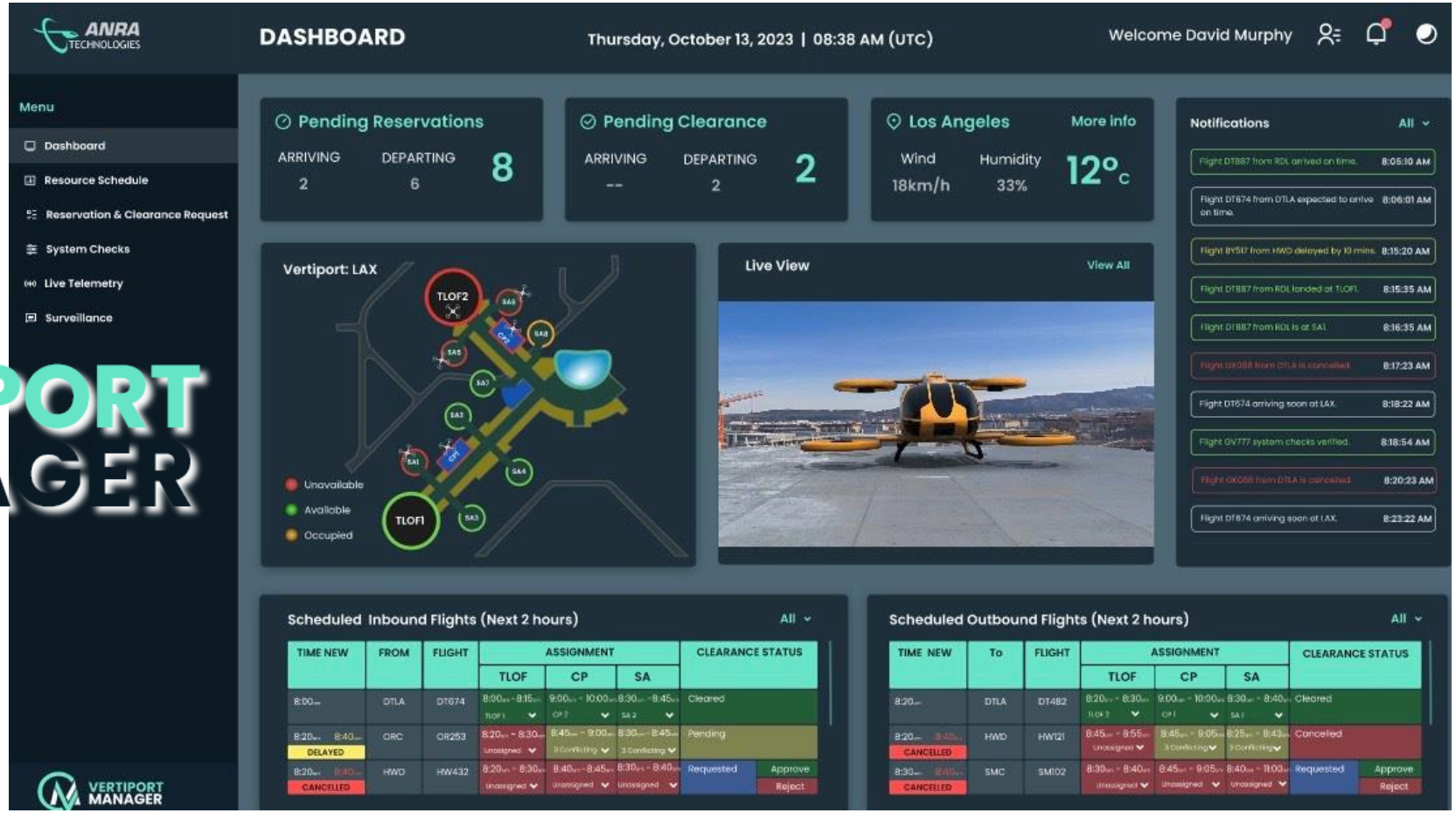
Fleet Management + Airspace Management

Digital Layer for Vertiport Management

Vertiport Management System

www.anratechnologies.com

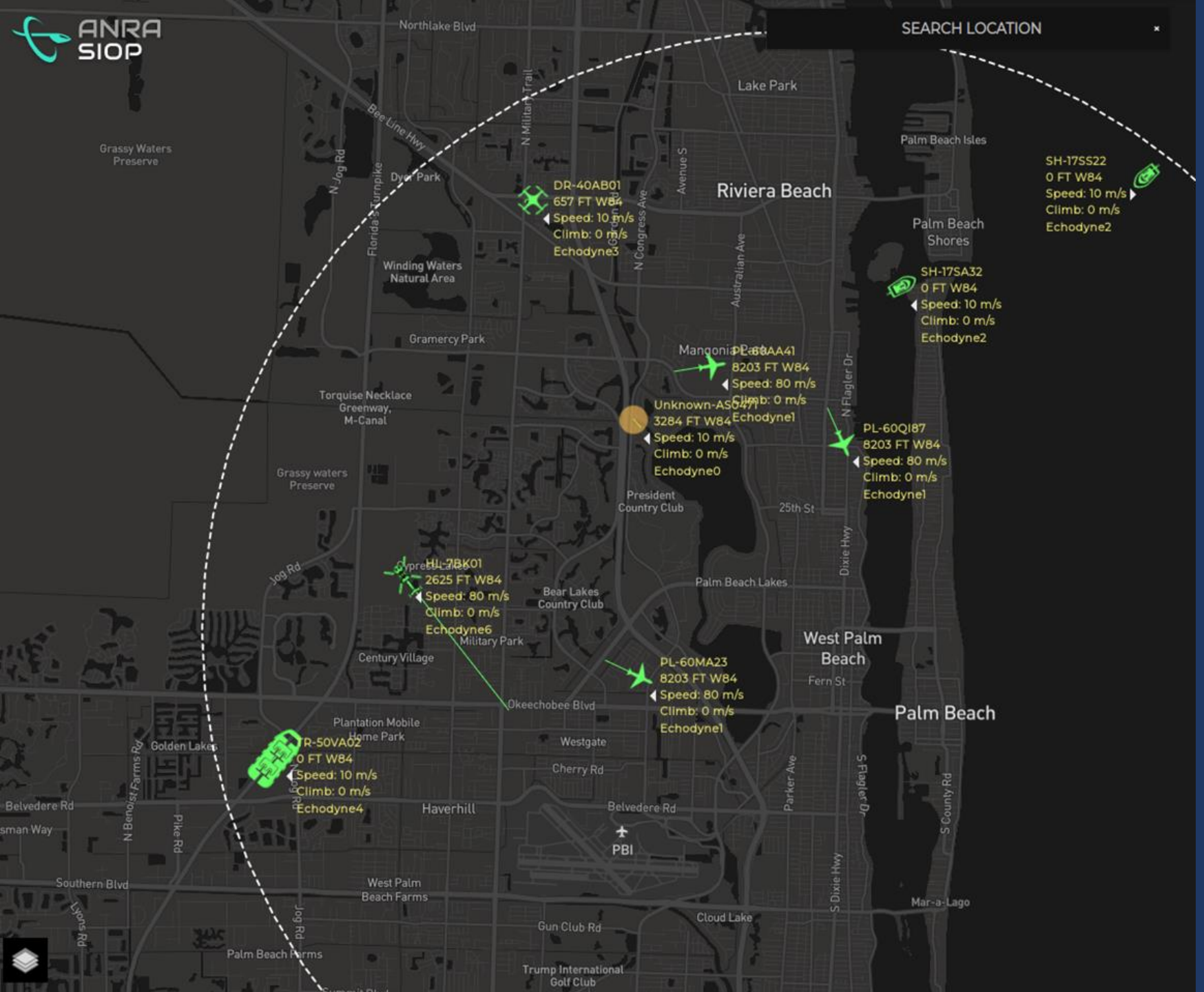
VERTIPORT MANAGER



- Dashboard for vertiport status
- Vertiport resource schedule
- Flight reservation and clearance requests
- System checks for vertiport status
- Live aircraft telemetry
- Micro weather service
- Live aircraft surveillance
- UAM airspace integration (PSU)

ANRA TECHNOLOGIES

Single Integrated Operational Picture (SIOP)



Single Integrated Operating Picture

- UxS = Sea (UMS), Air (UAS), and Land (UGS)
- Cloud-based software
- Features
  - Integrated operating picture
  - Displays surveillance data (radar, ADS-B, RF, AIS, etc.)
  - Displays map layers (aero, weather, GIS, etc.)
  - Blue Force UxS management, live tracking, path prediction
  - UAS collision alerting
  - Creation of Geozones (e.g., No-Fly Zone).
  - Role-based access

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Reston, VA 20190

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Noida, UP 201301

www.anratechnologies.com

An intro to Wing

On-demand drone delivery service

Kendal Prosack
Local Policy and Community Affairs Lead
kendalprosack@wing.com

Tariq Rashid
Part 135 Director of Operations / Chief Pilot
trashid@wing.com


Helsinki, FIN


Canberra & Logan, AUS


Christiansburg, VA
DFW Metro, TX USA


Lusk, IRE

Demand for urban last-mile delivery is expected to grow by 78% by 2030

Urban last mile delivery will create a range of growing problems for the world's largest 100 cities

+11 mins

Increase in commute times

+30%

CO_2 emissions in globally

Source: World Economic Forum, Urban Deliveries Expected to Add 11 Minutes to Daily Commute and Increase Carbon Emissions by 30% until 2030 without Effective Intervention, 2020. Link

What’s Wing? Why Wing?

Wing has built an end-to-end system

Aircraft OEM

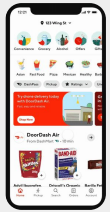
We design and manufacture delivery drones that meet the aviation industry's highest safety and reliability standards.

Operator

We offer drone delivery services on three continents, with 300,000+ real commercial deliveries.

Flight Navigation and Automation

We've built a highly automated system. Advanced vision allows our drones to understand their surroundings, and our flight planning and navigation systems allow them to plan their own routes, check their own systems for errors, and respond to delivery requests on demand.



Partnerships

Our delivery system can lower the cost of delivery for retail, logistics, and healthcare organizations, and is easy to set up and integrate with on-demand delivery apps, e-commerce platforms, and parcel carrier services that people are already using today.

Wing can provide fast & cost effective delivery, supplementing existing delivery methods

Fast delivery

Our drones don't get stuck in traffic. Our fastest delivery is 2 minutes and 47 seconds.

Cost efficient

Cheaper than traditional methods of delivery

Precise deliveries

Delivered on time and at the exact location selected

Sustainable technology

The delivery of a box of pasta takes less energy than cooking the pasta

Safer & less traffic congestion

Getting something delivered by Wing drone is safer than picking it up by car

Flying in DFW

Walmart and Wing

- 2 new operational sites in DFW
- Direct to home delivery in less than 30 min

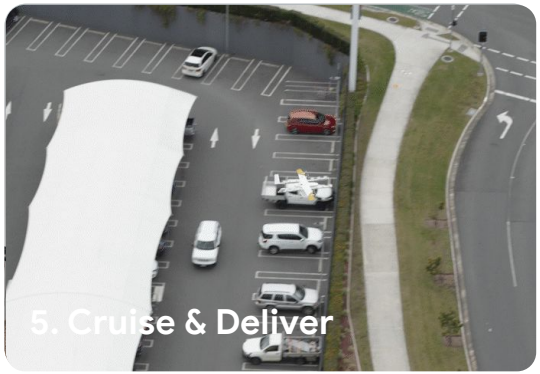
7000WB
Delivery Drone

Carries
2.6lbs / 1.2kg

Weighs
11.4lbs / 5.15kg

Delivers
6 miles / 10km

How it works



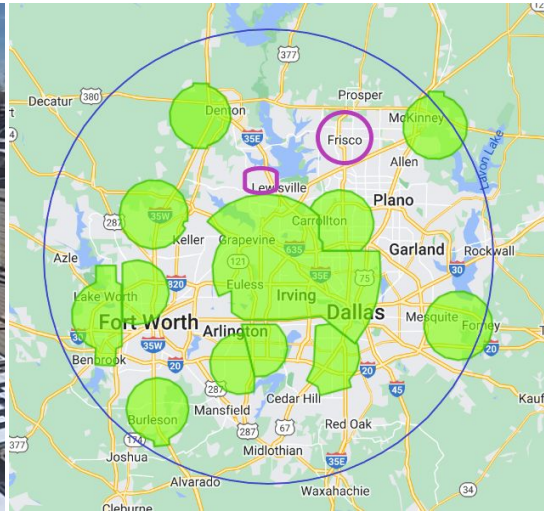
Wing in DFW

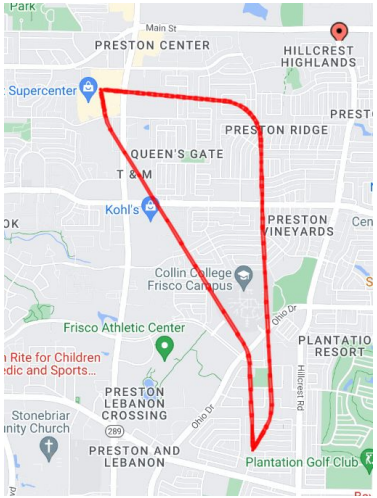
Part 135 Air Carrier with Exemptions

Today
- Two Partner Ops Bases (Nests) ~100-150 deliveries / day
- Two other Nests
- Operations Room (PIC Stations)

Next 12 Months
- 20+ Nests
- Distributed over DFW area

Very Automated
- Multi-UA
- Distributed Ops





Wing Communication Information

Part 135 Management

- Director of Ops (DSO): Tariq Rashid
- Chief Pilot (CSP): Zachary Conatser
- Director of Maintenance (DSM): Steven Richardson

Wing monitored frequency (listening only)

- Heli Common: 123.025 Mhz
- Wing also monitors ADS-B during operations.

Phone: Wing Operations Room: +1 214-217-9396

Wing NOTAM Contact Webform: https://go.wing.co/drotam-contact
Email: Wing Operations Room: wing-fops-center-us@google.com