

# Aerospace Arizona Highlights

## Day 1

We got a guided tour through portions of ASU's polytechnic campus. We saw rooms full of turbine engines, a massive room-filling flight simulator with realistic cockpit, a flight simulator on hydraulics that would take you way up and to the right if you nosed down and banked hard.

We listened in on a two-man student team preparing for a Reaper RQ-9 mission, we saw a virtual recreation of Skyharbor's ATC tower made with 9, 55" screens.

Toured manufacturing department. Had a 3D printed Eiffel tower standing 16" tall next to a micro 3D printed Eiffel tower standing just 3/4" tall and encapsulated in a glass vial.

Barrio Brewery afterparty was great venue to watch planes, grab a pulled pork sandwich and talk drones with the guys from North Carolina DOT.

## Day 2

### **Driving Unmanned Space Flight in Arizona**

Arnolod Soto, AQST space systems

- Noted that Arizona has an excellent industrial-commercial-education corridor from Flagstaff to Yuma. Forwarded the idea that we could call this the "McCain Space and Tech Corridor" for better visibility.
- Suggested building spaceports in Arizona.

### **Disruptive Technologies and the Convergence Towards Autonomous Systems.**

John Wolcott, Industrial Aerobotics

- Got started in solar installation inspections. Reduced potential 6-month inspection time using traditional methods down to 2-4 hours for unmanned inspection.
- Uses a VTOL Quadplane for bigger jobs. 1.5 hr. flight time with big payloads.
- Mentions drive towards automated image scanning so you can plug 4 miles worth of utility line photography/videography and automatically pop out 100 issues. Saves time over 2 weeks of manned imagery review.

### **Status of FAA Waivers. Common Mistakes, Keys to Success and the IPP, How Participants Received Waivers**

Jeremy Grogan, FAA

- FAA was quickly overwhelmed in early days of waiver process. Timeframe in excess of 90 days per waiver.
- His group he oversees now averages between 9-13 days per waiver.
- Since Dronezone inception, 99% of waivers being finished within 90 days.

- Gave multiple examples of good and bad waivers. Consensus is be as specific as you can.
  - Don't say "will use two-way radio for communication",
  - Say instead, " Remote pilot in Command and visual observer both outfitted and trained to use a Baofeng UV-5R two-way radio for crew communications"
- Your command of time-tested aviation knowledge and the aviation vocabulary that FAA is used to seeing directly influences your waiver's approval chances.

### **Live Demo, North Carolina DOT**

Provided overwatch and thermal imagery while local PD investigated suspicious van with potential bomb wired to wheel-well.

We also searched for a perp who was walking north through a heavily treed sidewalk area, so they were tough to track.

### **Autonomous Revolution of Vehicles and Transportation**

Mark Goldstein, Internal Research Center

- Covered many upcoming autonomous applications, include cars, buses and personal airplanes.
- Mentioned Doug Ducey's authorization for the establishment of the Institute for Automated Mobility here in the valley.
- Covered difficult ethical issues when programming autonomous, summarized in the original "trolley problem" from 1967 and was deeply investigated recently through MIT's 'Moral Machine'. The moral machine reached 40m participants globally and showed extensive differences of opinion based on regions of the world.

\*For those who haven't heard about the trolley problem or the moral machine, they're thought experiments on who should be saved in the event of a runaway car (and previously, a runaway trolley). You then must choose an unavoidable path of destruction that will either hit older or younger people, hit women or men, hit overweight vs fit people, direct yourself into a barrier and die to save others, etc.

### **Lessons Learned From Hurricane Harvey**

Tye Payne. Lone Star UAS Center of Excellence & Innovation

- Drones used to scout out sections of damage that would have been otherwise unreachable due to road debris.
- In preparation for next crisis, they are evaluating and collecting local pilots into a distributed drone response team across the state.
- Maximizing ability to respond during crisis through application for comprehensive waivers from the FAA ahead of time.

### **International Perspective on UAS**

Matan Yemini AIROBOTICS

- Centered in Scottsdale but they're a global company hailing from Israel.
- Builds an automated drone solution, essentially a drone in a box. For perspective, remember the box were talking about is roughly 1/2 the size of a car.

- When inside box, drone's batteries and payloads can be automatically switched out.
- Overcoming FAA regulations through extensive testing. 40K test hours over past five months.
- 30K/month rental fee

### **International Perspective on UAS**

Glenn Williamson. Canada Arizona Business Council

- Continuously developing and marketing the applications of unmanned technology is just as important as engineering new unmanned technology.
- Mentions generational trust issues with unmanned technology as potential roadblock. A component of this he better illustrates in an analogy from his time working with the military, occasionally he'd walk in on people who have control of missiles or other high potency weapons and they'd be at their ease with a bag of chips, big gulps and other snacks. It's an issue of not knowing who is behind-the-scenes and the possibility of that behind-the-scenes person having Cheetos stains on their shirt.

### **UAS and Aviation- One of Arizona's competitive advantages: State Policy**

Panel Discussion with multiple state representatives

- Arizona is competitive because of clear skies and a supportive business environment for aviation and aerospace.
- Open for business mentality, department director (not sure which one) that moved to close out Uber or Lyft because of concerns with drivers was quickly fired

### **The New FAA Reauthorization Act of 2018 and What It Means**

Sarah Nilsson, Nilsson Law, PLL

- Public Use rule for tethered UAS 4.4 lbs. or less is coming out
- Improving the FAA waiver process.
- New BVLOS laws for UAS 4.4 lbs. or less
- Expanding University-based Centers of Excellence around the U.S.
- Many more

Then we had an excellent dinner on the lawn at the Sheraton. Mesa's governor showed up for opening remarks and kicked off the night. Aerospace Arizona generously provided us two drink vouchers each.

## Day 3

### **Leading the Future: Development of UAS Within Academia (ASU)**

Stephen Fleming. University of Arizona: Don Wood, ASU Polytechnic School: Wenlong Zhang, ASU Polytechnic School: Christian Fortunato. ASU Research Enterprise.

-ASU Curriculum for UAS is rolled into their Aviation Management Technology degree. UAS specific classes are encapsulated within 5 courses, covering physics of flight, remote sensing, RF science,

real-world flight time, mission planning beginning and advanced, simulator flight from small UAS up to Reaper RQ-9's.

**A Rear-View Mirror Look at UAS Industry Progress and a View of the Road Ahead:**

Michael Toscano. Former President and CEO for AUVS

Generations now that are native to technology in their lives won't hesitate to use UAS for the improvement of their lives, their jobs and the world.

Best quote ever; "The future of UAS is so bright is need to wear glasses."