Beyond Visual Line of Sight UAS Operations: From Research to Commercial

CropLife Panel, April 26, 2018
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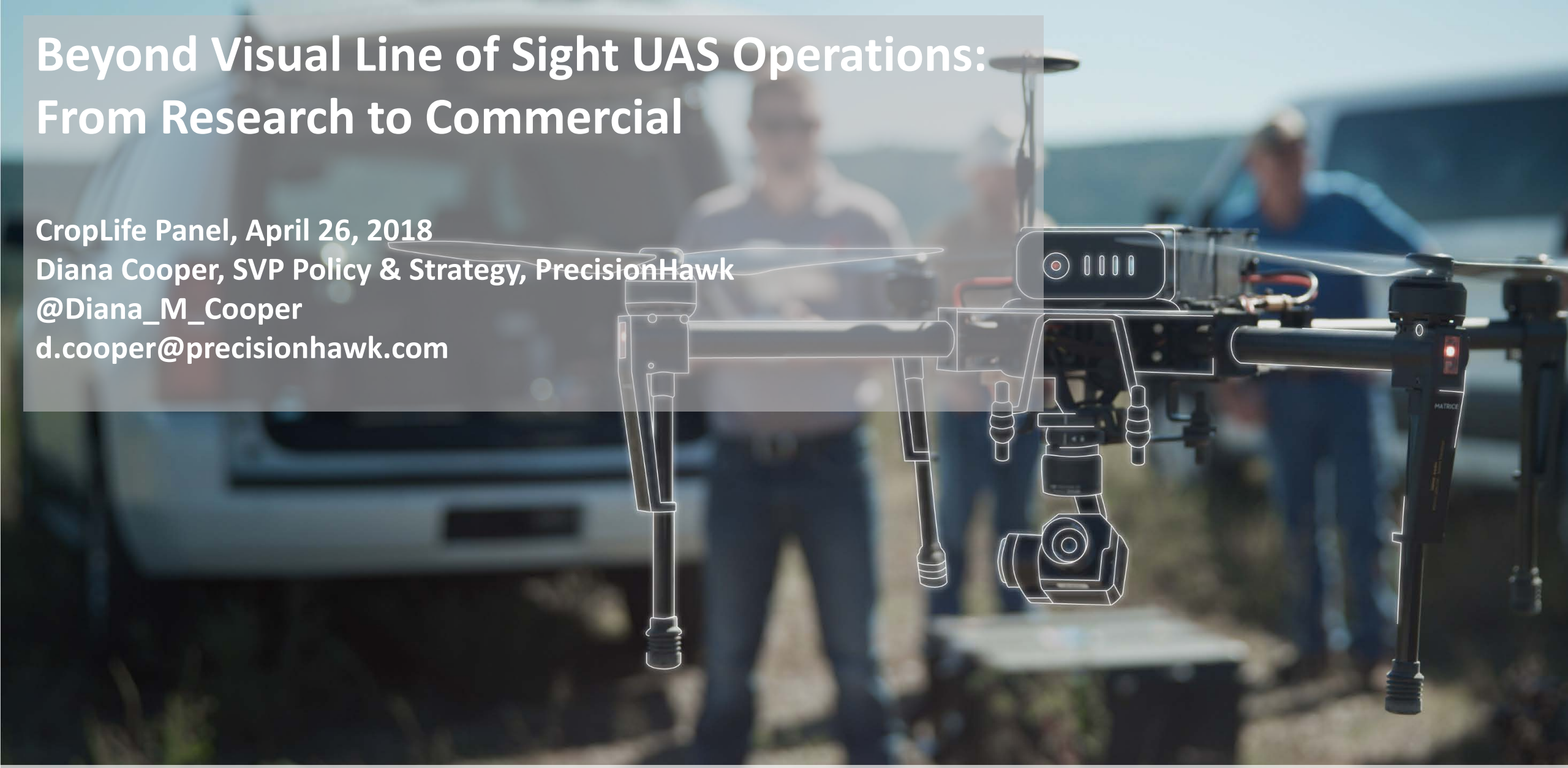

PRECISIONHAWK

Expanded Operations Timeline

BVLOS Waiver

- Backed by Pathfinder Research
- Significant financial investment conducting research for over a year by the time our waiver was granted
- Waiver application included 40 pgs of documentation – see my 2017 Symposium Presentation for details of CONOPS and ORA https://www.faa.gov/uas/resources/event_archive/2017_uas_symposium/media/Workshop_5_Part_107_Waiver_Process.pdf
- Waiver permits
  - Operations in class G air space outside of built up areas
  - Operations covering around 38 square nm (vs. 3.14 VLOS)
  - Does not require VO – option to extend area using Remote VO, however neither PIC nor RVO needs to see the UAS
  - Is not limited to a specific UAS type

BVLOS Waiver Application

Must include…

- Safety case that mitigates risks of proposed operation to acceptable level
- Method for Remote PIC to ensure separation from other aircraft
- Method for Remote PIC to know location, altitude, orientation and direction of sUAS
- Method for avoiding flying over people
- Method for determining operating limits of command and control links (i.e. How will PIC know if GPS is available? What if GPS fails?)
- Training program and qualifications for flight personnel
- Description of (performance-based) requirements that the UAS's used under the waiver will conform to

BVLOS Waiver Stats & Trends

- As of April, 2018, FAA granted 18 BVLOS waivers to 13 operators
- Most waivers require at least 1 VO (several require multiple VOs, i.e. the “FPV waivers”). PrecisionHawk’s doesn’t require VO.
- Some waivers limited to specific UAV model, while others are broader and based on performance based capabilities
- 6 waivers limited to specific geographic coordinates
- Key take-away → NO single Concept of Operations or Operational Risk Assessment for BVLOS operations and waivers!

How to Get to BVLOS

Gain VLOS experience with UAV

Pilot uses vision to separate UAV from aircraft. Pilot learns normal and emergency procedures, gains familiarity with how the platform performs.

Pursue localized BVLOS operations

Focus on pilot training and operating procedures to maintain separation, i.e. Pilot uses vision to scan airspace and detect manned aircraft.

Advance to longer distance BVLOS operations

Pilot uses technology to ensure separation: 1) track UAV position, 2) track cooperative manned aircraft, 3) detect non-cooperative manned aircraft. See Pathfinder FA2 Phase 3 Report, coming out soon.