



The use of UAS/RPAS at airports: A Canadian Perspective



About AERIUM Analytics:

- Remotely Piloted Aircraft Systems (RPAS) Service Provider and Solutions Integrator
 - Head Office- Calgary, Canada
 - Field Office - Edmonton International Airport
 - Field Office - Seattle, Washington
 - Field Office - Grand Forks, North Dakota
- Specialized in providing operations in complex environments (Airports, Mines, Oil and Gas, Forestry) and geospatial intelligence - 1000 plus flights on airport property in Canada and the US
- Fully-integrated service model
 - Wildlife management
 - Just in time - maintenance support and inspection
 - Reality Capture and digital mapping
 - Data processing and analysis
 - Development of Machine Learning and automated systems





About AERIUM Analytics:

- 1000+ flights on Airport Property (850+ at EIA)
- Demonstrations at Chicago O'Hare airport
- Operations at 2 Major Oil Sands Projects in Alberta
- Collaboration with USDA, FAA, EIA
- Support from FAA and TC



Drone? UAS? RPAS?

UAS: *Unmanned Aircraft System*

RPAS: *Remotely Piloted Aircraft System*

Canadian Regulations - Current and New

FLYING FOR FUN?

RULES FOR RECREATIONAL DRONE USERS

Consult the [safety measure](#) for the full list of rules.

It's the law! If you fly your drone for fun and it weighs more than **250 g** and up to **35 kg**, follow these rules:

Fly your drone:

- within 90 m above the ground or lower
- at least 30 m away from vehicles, vessels, and the public (if your drone weighs more than 250 g up to 1 kg)
- at least 76 m away from vehicles, vessels, and the public (if your drone weighs more than 1 kg up to 35 kg)
- at least 5.6 km from aerodromes (any airport, seaplane base, or areas where aircraft take-off and land)
- at least 1.9 km away from heliports or aerodromes used exclusively by helicopters
- outside of controlled or restricted airspace
- at least 9 km away from a natural hazard or disaster area
- away from areas where it could interfere with police or first responders
- during the day and not in clouds
- within your sight at all times
- within 500 m of yourself or closer
- only if clearly marked with your name, address and telephone number



Following these rules will help keep people, aircraft, and property safe. If you do not follow these rules, you could face fines of up to \$3,000.



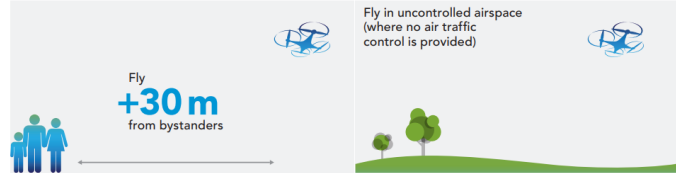
Canada.ca/drone-safety



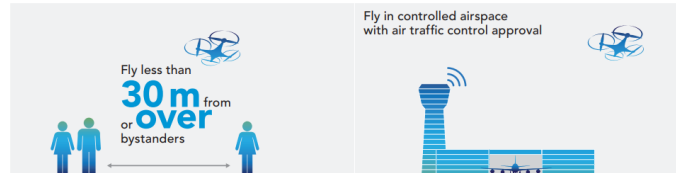
KNOW BEFORE YOU GO!

FIND YOUR DRONE CATEGORY

YOU NEED A **PILOT CERTIFICATE – BASIC OPERATIONS** TO:



YOU NEED A **PILOT CERTIFICATE – ADVANCED OPERATIONS** TO:



YOU NEED A **SPECIAL FLIGHT OPERATIONS CERTIFICATE** TO FLY:



Canada.ca/drone-safety



Canadian Regulations - Current and New

Current

- Recreational users do not require a permit but follow rec rules
- All operations for commercial or research projects require a Special Flight Operating Certificate (SFOC) issues by Transport Canada (TC)
- Class C (Controlled airspace) and F operations are permitted with an Advanced SFOC
- Night time operations allowed with appropriate SFOC
- Crawl, Walk, Run approach taken by TC (Site Specific, Region Specific, National)
- Airport operations allowed with permission from NAV Canada and local ATC
- Rules around operations at airports vary slightly from Region to Region

Canadian Regulations - Current and New

New (Effective June 1)

- Recreational and commercial operations blended into a 2 tier level of permitting
- Basic Operations
 - Class G Airspace
 - Online written test required
 - Register you drone
 - Stay 30m (100') from people
 - Remain below 400' AGL
- Advance Operations
 - Fly in controlled airspace, near people (>5m) or Over people
 - Advanced online written test and in person flight review required
 - Use of a UAS that has been safety assured for the operation type
 - UAS to be registered
 - NAV Canada grants authority for Controlled Airspace Operations

UAS Operations at Airports

Canada

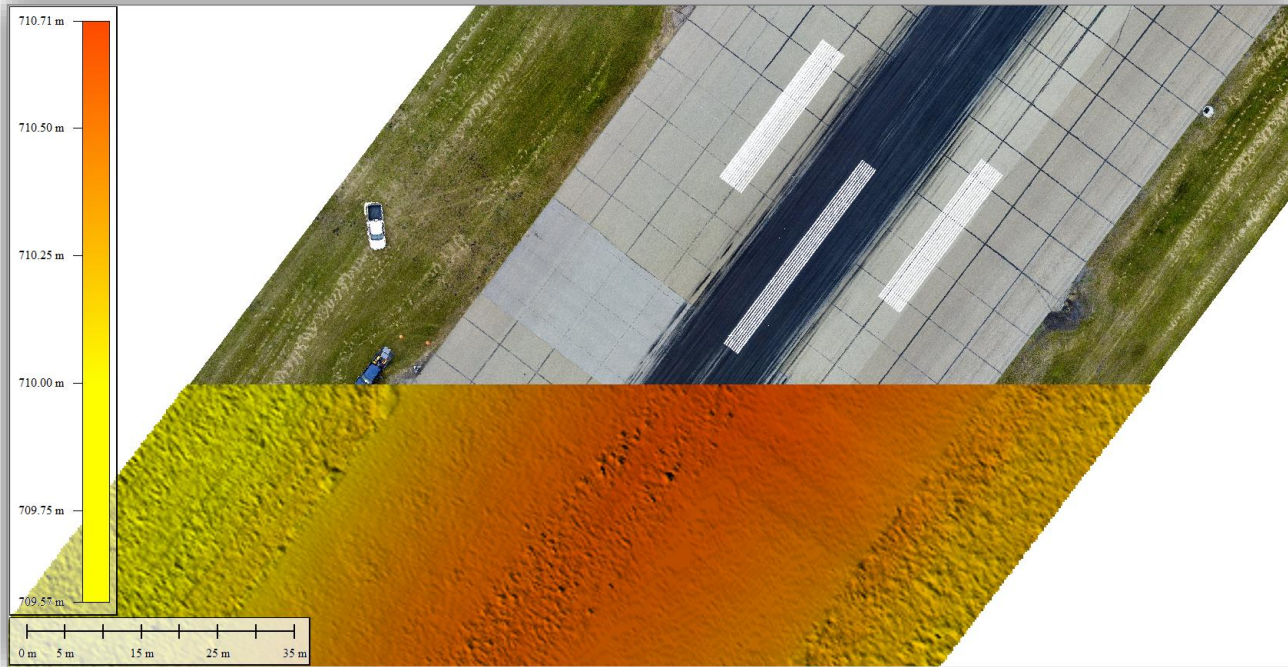
- NAV Canada developing a LAANC (Low Altitude Authorization & Notification Capability) type system to automate most requests
- Communications and consent for at airport operations still required
- Airport Authority involved on airport lands
- Process is formalized and commercial UAS operations occurring

USA

- Strong focus on IPP and trial projects
- Mechanism in place to allow for commercial UAS operations at Airports (Through LAANC and Certificates of Authorization [COA])
- One-off operations is the focus

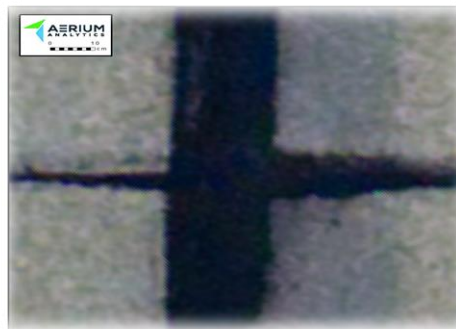
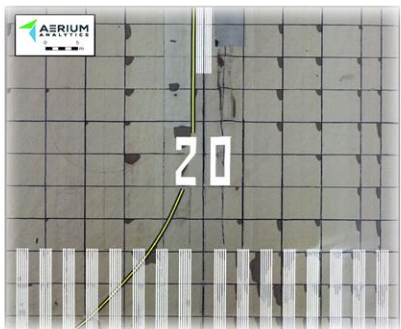
Airport Operations and Maintenance Support

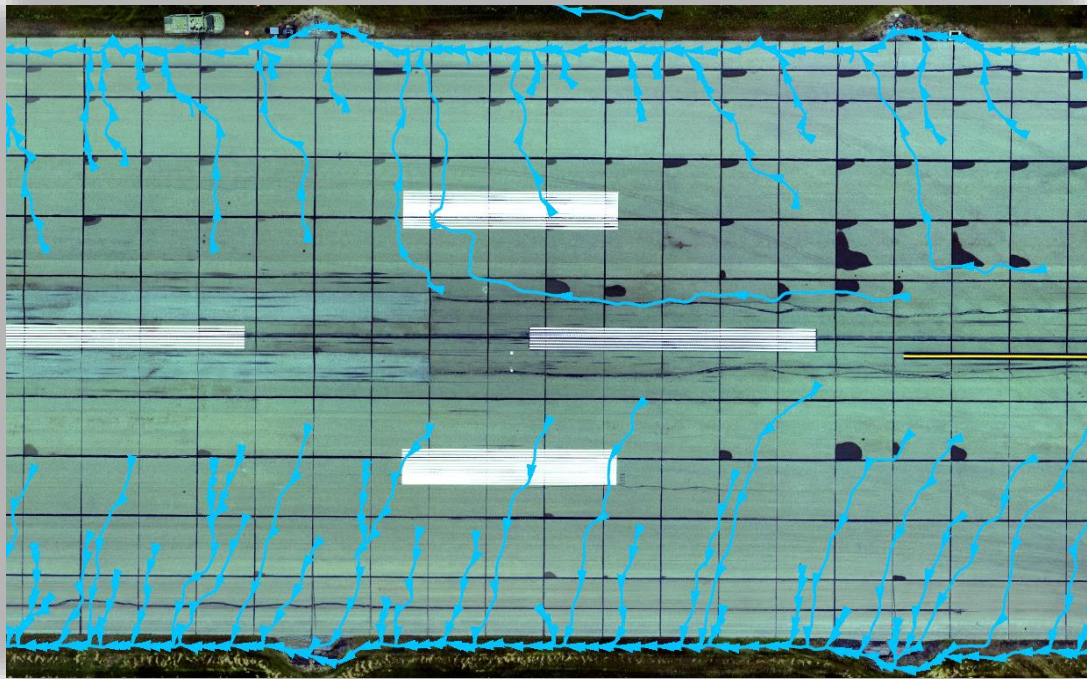




Runway, Taxiway, Apron Support

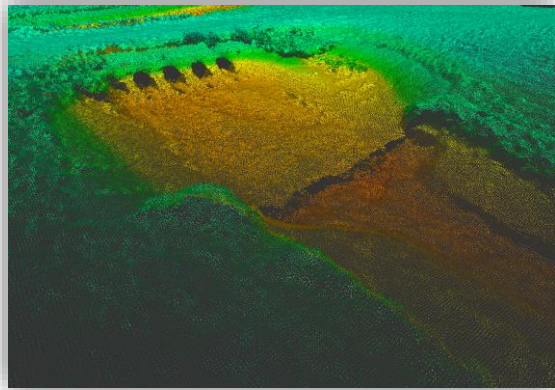
- TC312/Part 139
 - Runway Scanning
 - Marking Analysis
 - Deformation Analysis
 - PCI
 - Lighting Analysis

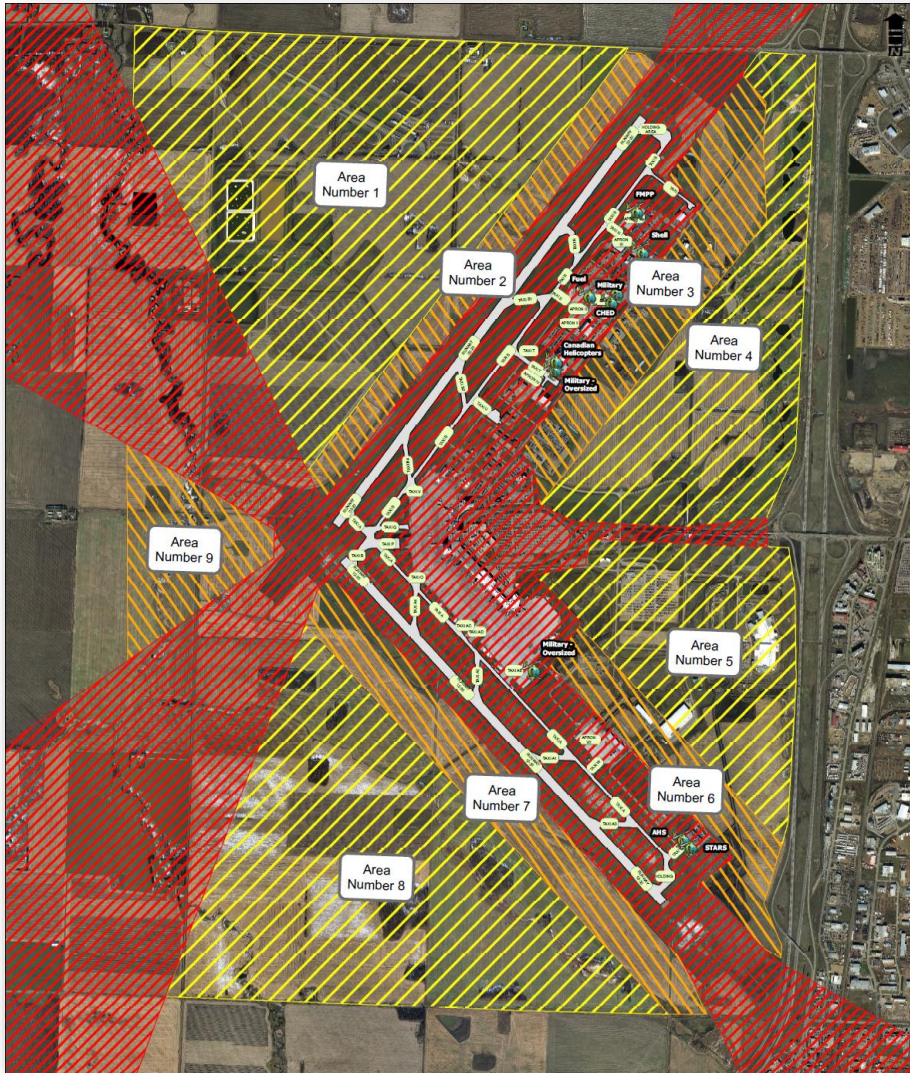




Airfield Support

- Drainage and Erosion Analysis
- Volume calculation for piles, ponds and ditches
- Thermal Analysis for water pooling





SAMPLE PROTOCOLS

Area is divided into sectors (one UAV in the air at any given time)

All operational zones approved in advance after Safety case / HIRA process completed

Operational Ceiling – 45m/150ft AGL

No operations within Critical Area B (Robird)

Operations adhere to strict schedule

Airside OPS – Cell phone coms with tower

Active monitoring of air and ground radio traffic



ROBIRD

Based on a female peregrine falcon.

Manufacturer: Clear Flight Solutions

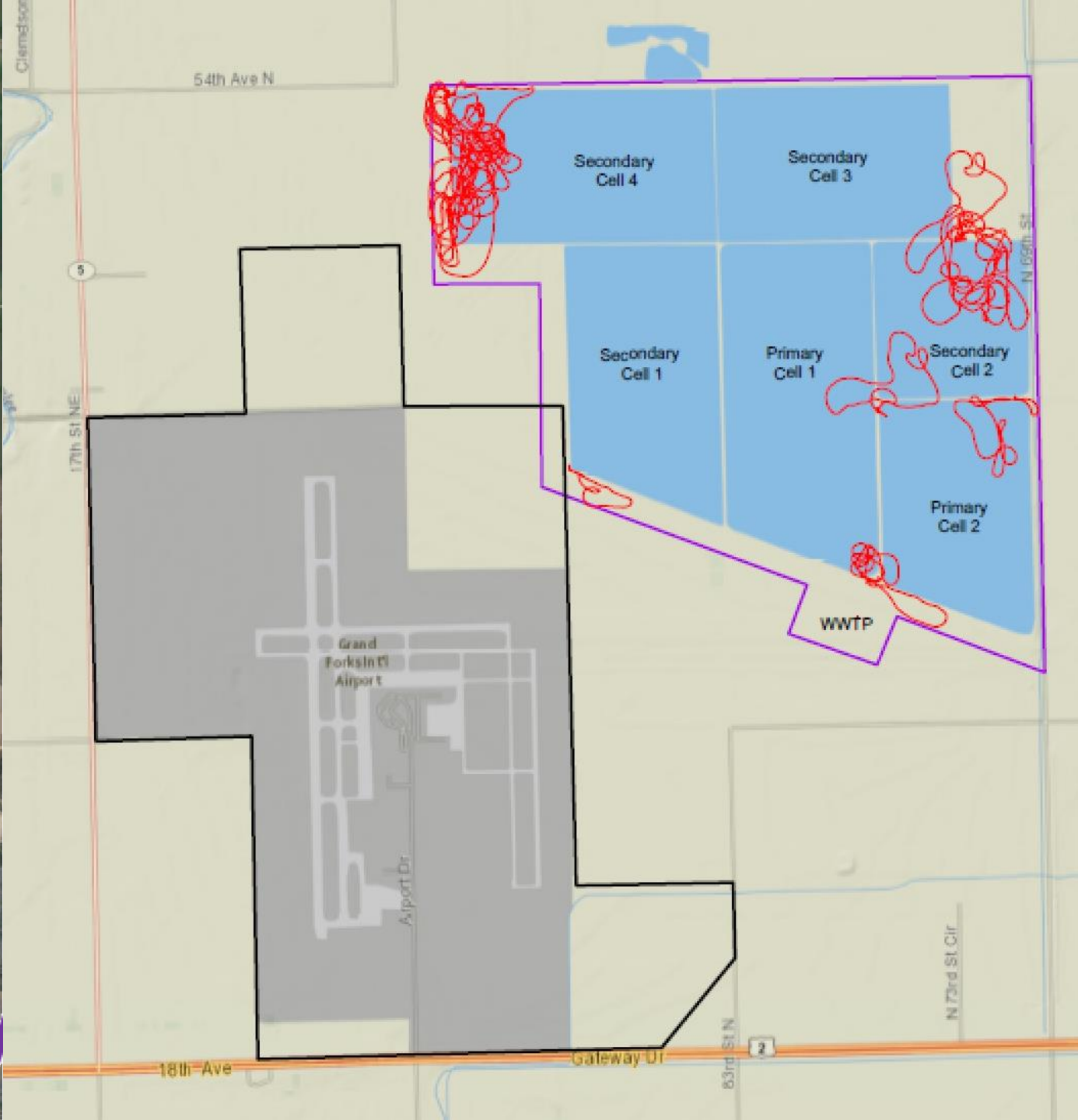
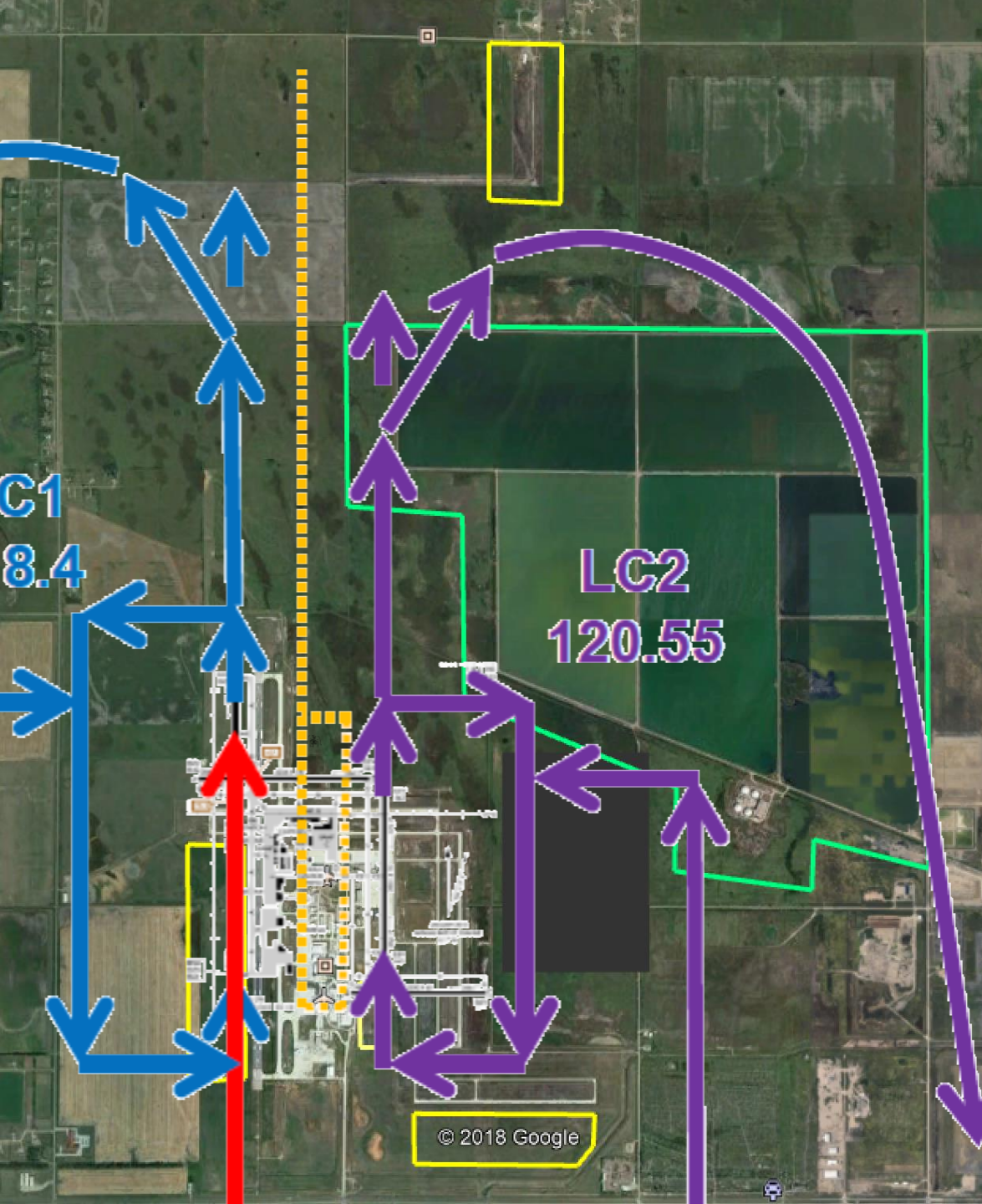
Operator: CFS AERIUM

TOW: 800 grams

Max flight time: 12 minutes

Propulsion: Flapping wing

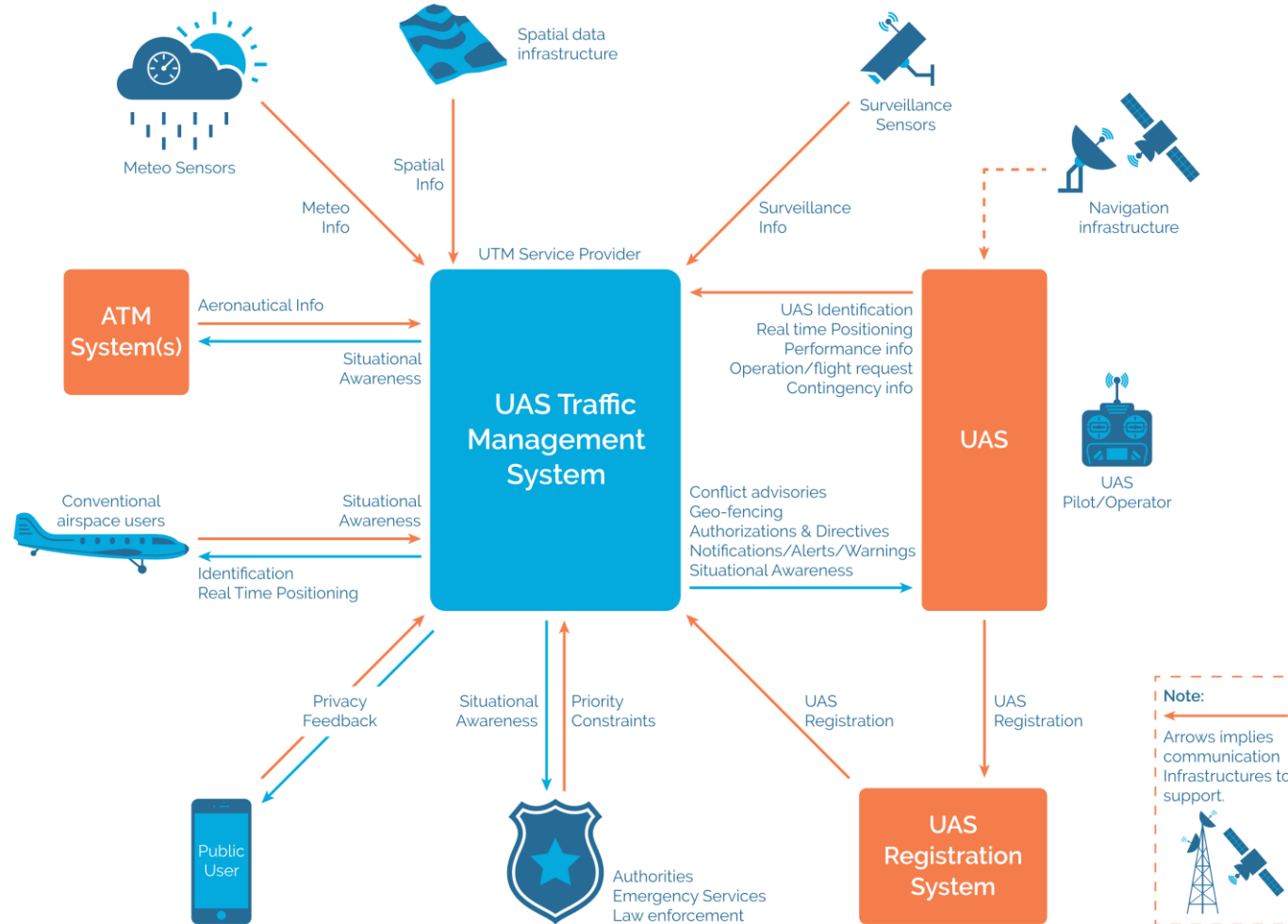
Max airspeed: 20 m/s; 38 kts



Questions and Focus

- Operations within current regulations balanced with future improvements (TCL 4, Reno)
- No 'Drone' Policies vs. **Drone Management Policies** (Cooperative vs. Non-Cooperative, Counter-UAS vs. UAS enablement)
- Who is ultimately held Liable? In Canada, ultimate responsibility falls to the UAS operator
- How are stakeholders notified and informed?
- What levels of insurance is required?
- Integration of UAS operations into traditional operations
 - How to not be a safety Risk?
 - How to not be a distraction?
 - What is the ultimate value?
- Team based approach is critical (Regulator, ANSP, Airport Authority, UAS provider)

Where is it all headed?



AI & UAS of the Future



- Development of AI
- ‘Drone’ Delivery
- Lightweight computer engines
- UTM and airspace integration
- 5G, Fiber and data transmission
- Full Autonomy

SAVE THE DATE

Oct 30th - Nov 1st, 2019



#UC19Ottawa

**Canada's 17th Annual National Unmanned Systems
Industry Conference & Trade Show**



QUESTIONS?

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