

Using Drones for Outfall Inspections

*This story was made with [Esri's Story Map Journal](#).
Read the interactive version on the web at <https://arcg.is/5H0bD>.*



GREENWOOD

EST 1864

INAFSM Conference - 9/6/2018

Locust F Room

Tom Maggard & Randy Weathers

City of Greenwood - Stormwater Dept

Outline

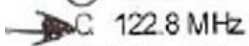


1. Getting Licensed to Use Your Drone
2. Greenwood Drone Specs
3. Choosing our Pilot Location
4. Our Pilot Study
5. Outfall Concern
6. Other Uses of Drones
7. Questions

1. Getting Licensed to Use Your Drone

24 (Refer to FAA-CT-8080-2G, Figure 22, area 2.) At Coeur D'Alene which frequency should be used as a Common Traffic Advisory Frequency (CTAF) to monitor airport traffic?

- A 122.05 MHz
- ☒ B 135.075 MHz
- C 122.8 MHz



PLT064 / UA.V.B.K6a Sources for airport data: Aeronautical charts.

12 Which is true regarding the presence of alcohol within the human body?

- A A small amount of alcohol increases vision acuity.
- B Consuming an equal amount of water will increase the destruction of alcohol and alleviate a hangover.
- ☒ C Judgment and decision-making abilities can be adversely affected by even small amounts of alcohol.

PLT205 / UA.V.EK2 Drugs and alcohol use.



In order for a business/government entity (Flying For Hire) to legally fly a drone you must have a license from the FAA pursuant to code **14 CFR Part 107** (link: <https://www.ecfr.gov/cgi-bin/text-idx?SID=e331c2fe611df1717386d29eee38b000&mc=true&node=pt14.2.107&rgn=div5>)

Our city pilot attendant a 6-8 week class given by EAA Flight Club to be prepared for the Airman Exam for UAS to obtain his license

- He would recommend finding a class in your area that will prepare you for the exam
- You can also find practice exam materials online

License is good for 2 years

2. Greenwood Drone Specs



Greenwood was looking for a drone that had the following criteria:

1. Easy to fly/use
2. Good camera
3. Cost effective

The Typhoon 4K fit all of those criteria

1. 'touchscreen controller for faster setup; captures 4K video'
2. 'ultra-high definition resolution (four times the resolution of HD); high-quality images with the ability

to capture slow motion 1080p / 120fps and 12 megapixel photos'

3. Cost was approximately \$1,700

Overview Page Online (link: <http://us.yuneec.com/typhoon-4k-overview>)

3. Choosing our Pilot Location



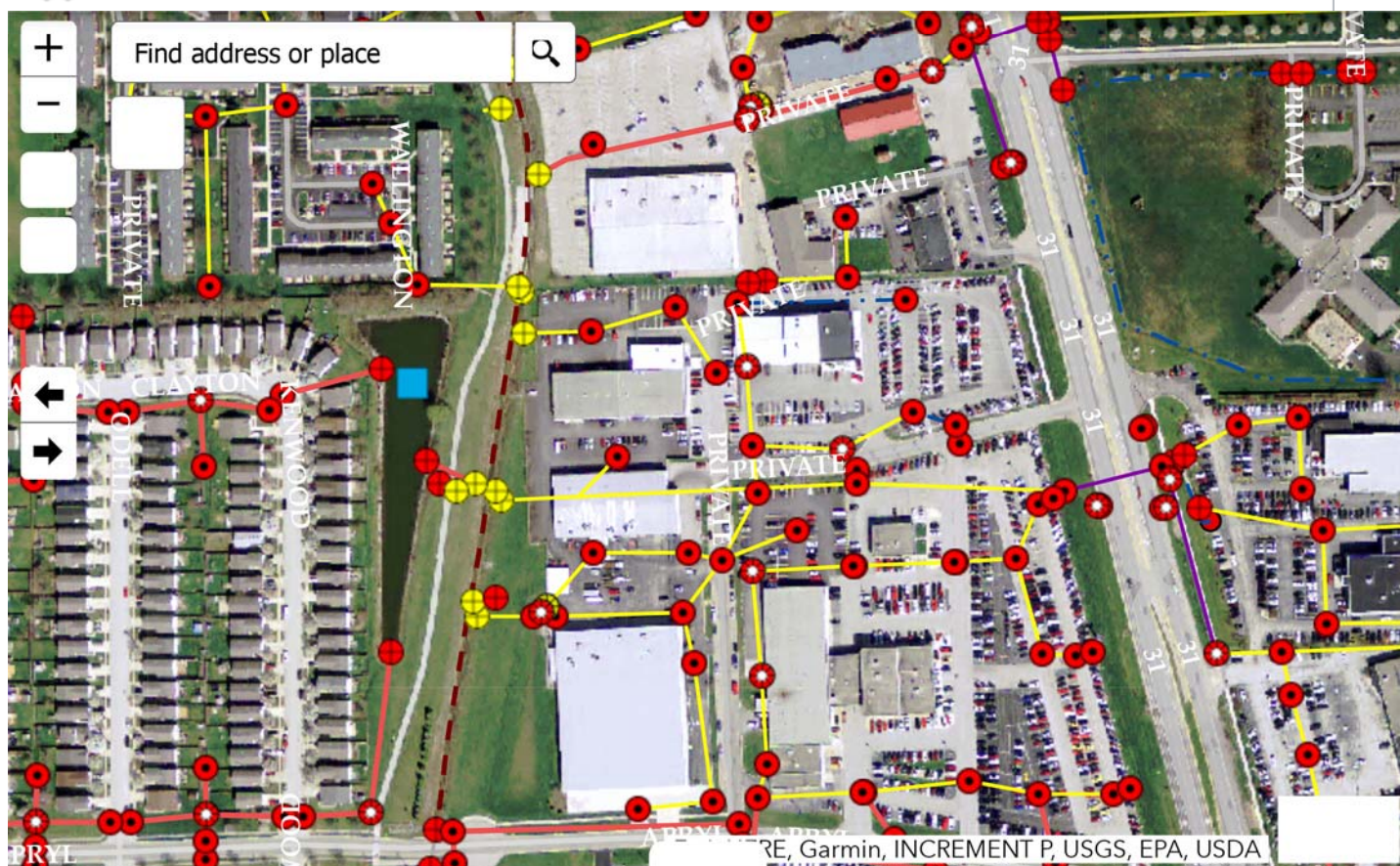
We looked at the following conditions in choosing a spot for our Pilot Study

1. Maximize amount of surveillance locations
2. Time of year
3. Open space with high visibility
4. Minimal or no people around
5. Good weather

4. Our Pilot Study



Stormwater Map



Tracy Ditch just north of Apryl Dr

This area satisfied all our conditions when looking for a location for our Pilot Study

Overall we were very happy with the process

- able to obtain good pictures & videos
- gained ability to get better looks at outfalls that historically difficult to reach

1. Won't replace all physical outfall inspections
2. Definitely will allow for safer inspections of difficult to reach outfalls
3. Speed up inspections where we have multiple outfalls in close

proximity

Pictures of Process (link: <https://1drv.ms/f/s!AqSzikQH8fP4gY1j-2IML6LBGb30dw>)

Pictures from Drone (link: https://1drv.ms/f/s!AqSzikQH8fP4gY1kLDP4aXHvA_FE0Q)

Video 1 (link: https://1drv.ms/v/s!AqSzikQH8fP4gY1nsc_Fr_FpBptEiQ)

Video 2 (link: <https://1drv.ms/v/s!AqSzikQH8fP4gY1iN-ahKF9a3iCynQ>)

5. Outfall Concern

- pH: 8.18
- ODO: 89.3 %
- Specific Conductance: 805 ($\mu\text{S}/\text{cm}$)
- Turbidity: 1.88 FNU
- NO₃: 125.2 mV
- Temperature 69.7 °F

As you saw with the last video we did notice an issue with one of the outfalls from our pilot study

Since we weren't prepared for that possibility the Stormwater Dept returned to the location with proper testing equipment

Once they got a sample the results that were returned are to the right

6. Other Uses of Drones



Since it's hard to justify the money for a drone for just outfall inspections, it's important to look at other opportunities to use the drone

We've done that in Greenwood

Road Work

- Madison Ave Bike Lane
- Multiple Roundabouts
- Surina Way

- Worthsville Rd

Special Events

- Rock the Clock
- Aquatic Center Adult Night
- Airport Day

Economic Development

- SR 135 Corridor
- Facade Project

Potential uses in the future

- Construction Sites
- Inspections

7. Questions



Questions for your esteemed presenters???