Drone Training for Portland's Mitigation Action Plan

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http://www.hayden-island.com/drones-on-the-columbia/

Executive summary:
This proposal would provide Portland with trained drone pilots and an operational plan for rescue and mitigation activities in Portland after a large earthquake.

This paper was prepared as feedback for Portland's Mitigation Action Plan. It describes an approach that save lives and money using standardized drone training. The author is a Neighborhood Emergency Team member but this paper is solely the opinion of the author.

In June 2016, the FAA issued Part 107 Small UAS Rules (pdf) for routine non-recreational use of drones. The new FAA rules make pilot certification easier and flying less restricted. A pilots license is no longer required. Drone pilots must take a test for the necessary certification and pay $150.

Portlanders benefit. Coordinated with PBEM and a college (like PSU or PCC), or drone organizations (like PDX Drones or Roswell Test Flight Crew), first responders, utility companies and citizens, like Neighborhood Emergency Teams, might get standardized training at discounted rates. A standard $500-$700 fee (for example) might cover the $150 FAA expenses and local training costs. It would provide Portland with qualified pilots and a coordinated mitigation plan.

Introduction:

Providing fast, accurate monitoring of Portland's infrastructure is the goal of this proposal. The National Guard may be grounded after a 9.0 quake, but tiny SD chips carry video, stills and data on a drone. They may make the difference between life and death.

Oregon's nascent drone business is flying high. The FAA approved 3 drone ranges in Oregon two years ago. This June the FAA approved part 107 drone rules. Meanwhile, Oregon's pioneering drone manufactures and software developers are booming.

Stephen Burtt co-founded Aerial Technologies International in Clackamas. Their drone system can fly for up to 25 minutes and is used to help farmers monitor crops or help first responders to monitor oil spills and fires. Portland-based Skyward's flight planning software is being integrated into professional, cloud-based software solutions like Drone Deploy and PrecisionHawk DataMapper. They make data analysis fast and easy and comply with FAA rules.

A Portland-based drone training program would:

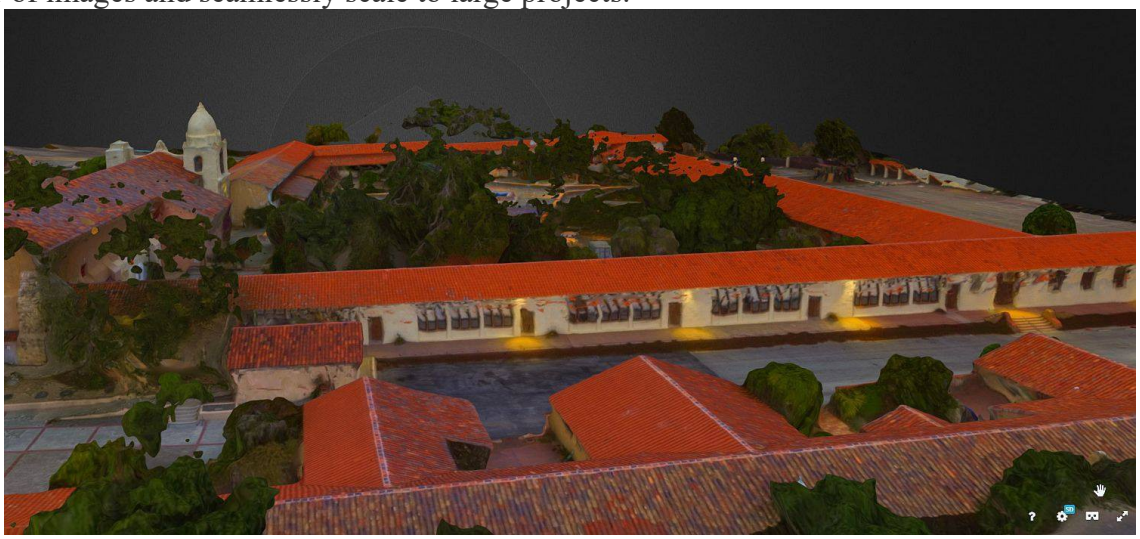
- Provide immediate situational awareness with live video and photos.
- Map routes and upload footage.
- Deliver small, light medical supplies and paperwork.
- Create a pool of certified pilots and software professionals availabe for gas, electricity, water and transportation bureaus.
- Neighborhoods would coordinate their mapping and monitoring activities
- Attract a younger, more diverse population to serve PBEM and government

Non-profit organizations like PDX Drones attract many experienced pilots. This proposal would expand that base. It provides a pool of certified pilots, training, and a plan for city-wide response:

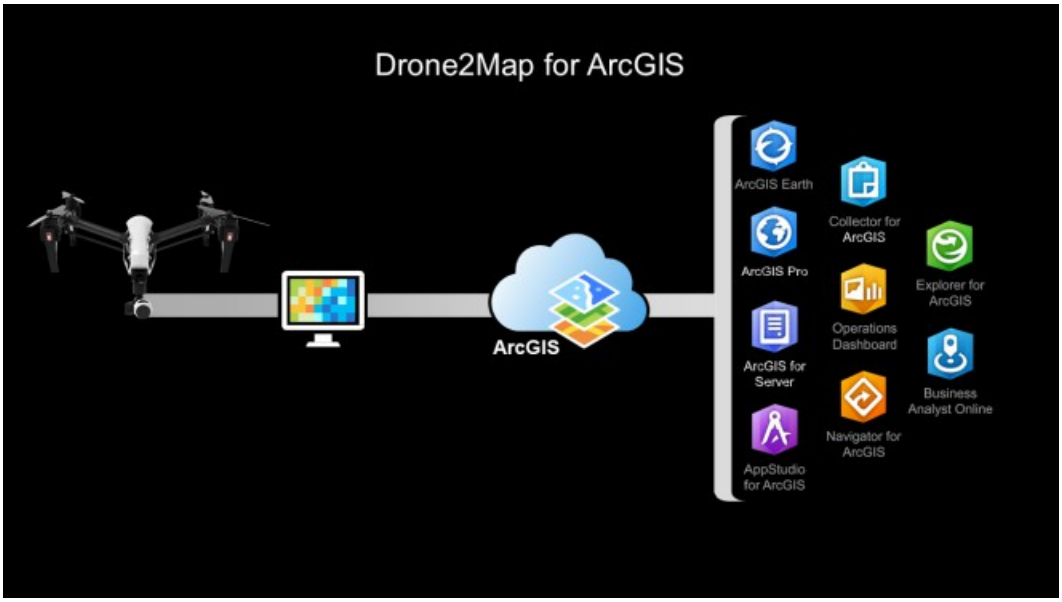
- Several dozen Phantom Pilots, would be certified compliant with Part 107 FAA rules.
- Mission planning software certification in Drone Deploy, DataMapper and other software.
- "Go Kits" the size of a bike trailer or smaller, complete with quadcopter, extra batteries, manuals, spare parts and communications gear.

New Tools:
Small drones are expected be used for river and transmission line surveillance, spotting forest fires, search and rescues, and law enforcement using Part 107 FAA rules. Drones provide real-time information to firefighters. “I think you are going to see them sooner than you think,” said Rusty Warbis, flight operations manager at the BLM’s National Aviation Office.

Cloud-based map and model generation like Drone Deploy and Propeller Aero make it easy to map stills. Correlator3D, a software package by SimActive, can be used on drones. They input an unlimited number of images and seamlessly scale to large projects.



Here's a 3D model made by Drone Deploy. First you draw a flight pattern on the map. Then, Drone Deploy takes over and flies the drone. It takes hundreds of photos automatically. Lastly you upload the photos to merge them into one, giant, zoomable map. In 3D if you want.

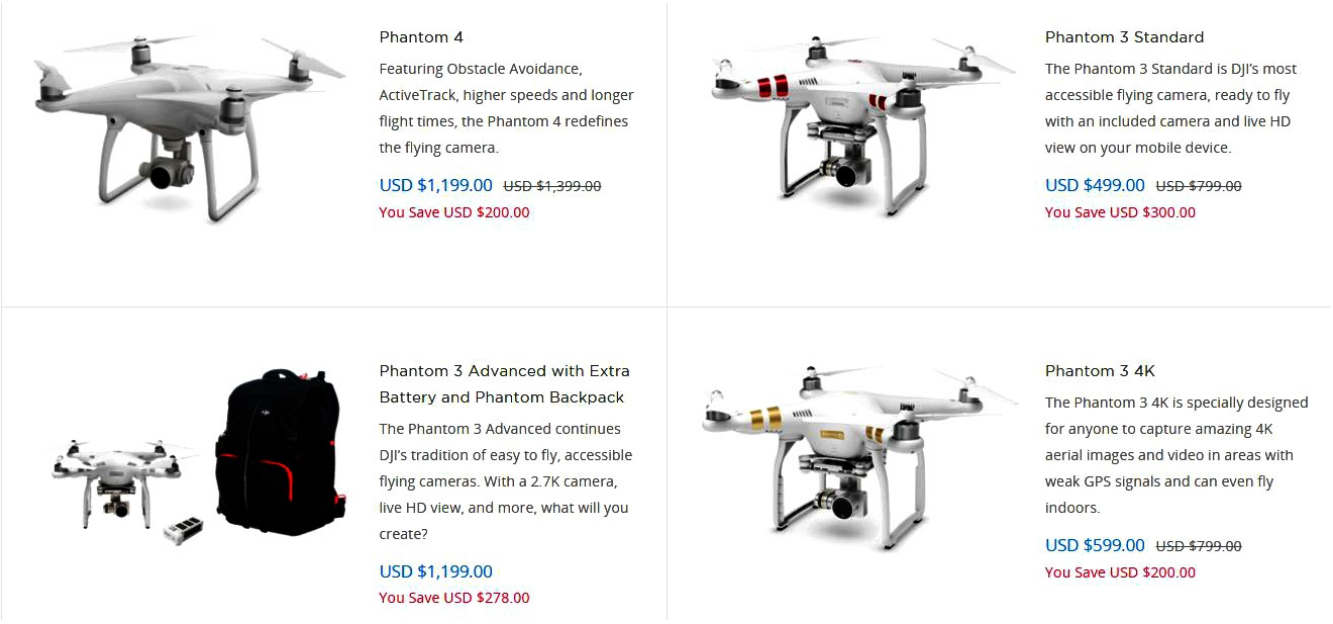


Esri’s ArcGIS provides maps and analytical tools for government, business and utilities. Esri’s Drone2Map for ArcGIS takes raw image data from drones and creates digital surface models, 3D-point clouds and 3D PDFs that can be shared. They're used by governments everywhere.

Training:
The development of FAA-approved test sites in Oregon, Part 107 FAA rules, ADS-B automation, flight-plan and mission planning software for UAVs, embedded processing chips, FLIR, hyperspectral and Lidar cameras, and broadband wireless connections are giving more power to the people. This asymetrical force is growing fast. Portland could direct this energy to form a more resilent city.

Training is the key. The goals of a Portland drone training program might include:

- A pool of 20-30 trained and Part 107 certified pilots available to the City of Portland.
- A package of hardware, software and personal designed to be utilized in emergencies.
- A training program not unlike Portland NETs. It might consist of 20-40 hours of hands-on drone training with hardware, software, classroom and flying experience.
- A diversity element would be included with broad outreach.
- Training materials and class time would be available at discount for low income particpants



Drone pilots, trained in software techniques and familiar with the requirements of government, will be in high demand after the quake. But for less than the cost of one truck, Portland could have a whole team of effective responders. A strike force that can map and monitor city emergencies. Drones can do it faster, better. They're more responsive than anything imaginable just 5 years ago.

Summary:
Drones are today's smart phones Once considered toys for the rich, they are quickly evolving into real tools, empowering everyone. The FAA's Part 107 rules have created a standardized certification program and legal structure. Portland companies like Skyward and Intel are testing LTE for drones. Non-line of sight flying may soon be possible.

Portland can get ahead of this curve, saving lives and money. Today.

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