Drones Take Flight for Local Government

Ben Miller | July 1, 2018

Once a bulky, powerful tool mostly used in the armed forces, drones have finally reached the hands of average people and the local governments that serve them.

And they have a lot of ideas: Use drones to gather intelligence during rapidly evolving public safety situations. Fly them above fires to get better information on how to put them out. Send defibrillators to people having heart attacks.

Drones would be doing all those things, except that the Federal Aviation Administration's regulations make them impractical. Operators can't fly drones above groups of people, at night or beyond their line of sight without getting waivers that can take months to receive.

So the FAA has set out to relax those restrictions. The administration is running a program, called the Unmanned Aerial System Integration Pilot Program, where local government and private partners will run tests doing exactly the kinds of things they can't currently do. The idea is that the FAA will observe the tests and use what they learn to rewrite the rules.

The 10 test sites they selected in May — the Choctaw Nation of Oklahoma; San Diego; Herndon, Va.; Kansas; North Dakota; the Mosquito Control District in Lee County, Fla.;

the Memphis-Shelby County Airport Authority; North Carolina; Reno, Nev.; and the University of Alaska Fairbanks — will become important locations in influencing the future of drone use in the U.S., especially as it concerns state and local government.

But in running the contest, the FAA gathered ideas from a lot more places than it chose. In all, 150 different communities applied. The list of people who signed up as interested parties is even longer — more than 2,500 people from all across the country, and some from other countries, contacted the administration.

In reviewing that list, *Government Technology* found that there are some places in the U.S. that look like particular hot spots for public-interest drone use. In fact, some of them were sparsely populated areas that exhibited more interest than major cities.

The four that really stood out were Huntsville, Ala.; the Washington, D.C.-Northern Virginia area; Denver; and the state of Montana.

In the end, only one of those areas — Northern Virginia — featured a winning applicant. But the four areas, being diverse and geographically distant from each other, hold a lot of insight into how drones might become important for government in the future as they become easier to operate in more situations.

DENVER AND COLORADO

The restriction probably holding back drones the most is the prohibition on flying beyond the operator's line of sight.

Ben Miller, director of the Colorado Center of Excellence for Advanced Technology Aerial Firefighting (and of no relation to the author of this article), knows first-hand why that's important. He used to fly drones for the Mesa County, Colo., Sheriff's Office.

"I flew drones on guys with guns," he said. "I would've loved to be farther away from them."

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"I would say having 300 sunny days a year is beneficial to drone flight," he said.

Edson and Nate Fogg, the Sheriff's Office's emergency manager, have several ideas for how they would use drones if restrictions were relaxed.

The county they protect has some unique challenges. It's shaped like a long rectangle, more than 70 miles from end to end stretching from the southern suburbs of Denver to the grassy fields out east. It's a long trek from one side to the other.

They have a lot of things to monitor in that rectangle — particularly fire. All that grass is good fuel for a blaze. Then there's the matter of regular explosions nearby.

"We have a former bombing range … for the Air Force from the end of World War II up through Vietnam," Fogg said. "The Army Corps of Engineers is still doing all the work of the unexploded ordnance out there, and it's not uncommon to have a fire."

Sending a fire truck and crew out to see whether a column of smoke is a blaze or just a run-of-the-mill detonation isn't a good use of resources. For that matter, neither is sending a truck out to a reported fire only to find out that it wasn't needed.

Flying a drone would be better. But if an operator isn't able to fly beyond their line of sight, they would have to travel along with the drone.

There's also the matter of flooding. In 2013, Arapahoe was one of several counties in the area overwhelmed with water during an intense storm. In responding to those kinds of situations, emergency officials need to know where the damage is and what kind of situation they're headed into.

"Landscape changes," Fogg said. "We had … channels changing, roads that disappeared, that sort of thing. So we can get good images, use that for disaster planning [and] financial reimbursement through the federal government if it's available."

MONTANA

Montana had a particularly bad fire season last year, with blazes sweeping across more than a million acres of land.

"Last year, our fire season ran pretty late. It ran through September," said Jennifer Fowler, director of autonomous aerial systems at the University of Montana. "So then the land managers are automatically going, 'What do I need to do for restoration? We're talking about logging operations, do I need to be out there planting trees and when do I do that?'"

Fire is one reason Fowler thinks her state showed so much interest in the FAA's drone program. She also pointed out that the state doesn't have a very dense population or a lot of airports — which means there's a lot of more-or-less unrestricted airspace. In other words, it's an easy environment to test in.

"Our certificates of authorization tend to be much less complicated because our air space is much easier to work in," she said.

There are a lot of ways drones might help firefighters. Operators could use them to get a better view of where a fire has spread to, which could give them a better idea of how to fight it. As crews move into areas that have been burned, drones mounted with thermal cameras could point out hot spots on the ground.

Fire departments are already starting to do these things. But it's fairly hard to do while complying with the rule to not operate the drone beyond visual line of sight.

"Particularly in western Montana, the pilot could be on one side of a mountain and the drone could be on the other side," Fowler said.

Drones could also help perform work to prevent fires from getting so bad; more efficiently so if they could be flown beyond the operator's field of vision. Land managers can use them to do studies of forests — how many trees there are in which places, what the moisture conditions are, how much fuel there is for a blaze.

And it's not just FAA regulations preventing some of these things from happening. Fowler can tick off a host of questions she has that will affect when and where drones are actually practical for government to use — how long do the batteries last? How fast can a drone deliver its data to a user? What about in places lacking a good Internet connection?

"What's the maximum size of a fire that a UAV can actually fly, get the information, process it and get it back to a manager so they can actually do something with the information?" she said. "And depending on how many pictures you're taking, doing photo barometry, it could take up to 24 hours just to process the information and then you've missed your deadline."

HUNTSVILLE, ALA.

Huntsville, population 180,000, is perhaps one of the most disproportionately technology-heavy cities in the U.S. It's home to a public university, a NASA space center that was instrumental in the 1960s Space Race, and the U.S. Army Aviation and Missile Command.

And Dave Arterburn, director of the Rotorcraft Systems Engineering and Simulation Center at the University of Alabama in Huntsville, thinks it's a great place to test drones. That's because of the diversity of its air space — in addition to all the military aircraft around, Huntsville is an inland port with rail and truck service as well as an airport. It has an urban core, suburbs and lots of surrounding rural areas.

"We have all types of air space related to specific issuesin air operation," he said.

Arterburn is particularly interested in package delivery, and the ability of drones to streamline the whole process.

"We're talking about the range of delivery, all the way down from cargo to personal delivery," he said.

But there are a lot of other ways he could see drones being helpful with relaxed restrictions. One of them is studying the weather and improving forecasting models.

With balloon launches, weather forecasters can get a lot of information. But balloons have a tendency to drift. Drones go where they're told.

Specifically, that means scientists could use them to move up and down vertical columns of air with all the sensors they need to gather good data. To do that, they would probably need to fly up high enough that operators on the ground couldn't see them anymore.

"If you can gather all the same [information] but for columns of air ahead of the front … those models become much more accurate," Arterburn said.

Finally, he has an interest in studying ways to help drones navigate on their own when an operator isn't directly controlling their movements. In particular, he said, the government can use buildings as markers to help drones orient themselves.

That could free them to draw their own routes, keeping out of restricted air space and dangerous areas while traveling to where they can do something useful for a public agency. Or, perhaps, deliver a package.

"My building at UAH isn't going anywhere, so why not let the UAS use that as a highly accurate point of navigation that doesn't cost the city a lot?" Arterburn said.

GREATER WASHINGTON, D.C.

Most people interviewed for this article pointed to one particular driver of drone use and development in the U.S. — the military.

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Coffey is now executive director of unmanned systems with Cherokee Nation Technologies, which acted as a private-sector partner for multiple applications in the FAA's drone program (it's part of the successful Alaska proposal). He pointed to a common understanding of the three Ds of drones: dull, dirty and dangerous work.

"Going out and surveying a farm or surveying a forest, which is just a boring mission … that very same forest that you just surveyed that was healthy and doing well catches on fire, and now you're going from a very dull mission to a very dangerous mission surveying wildfires," he said.

Thomas Zajkowski, a program manager for Cherokee Nation Technologies and also a flight operations manager at North Carolina State University, sees sort of a backward relationship between D.C. and state and local government when it comes to drones.

That is, a lot of those governments rely on the federal government to provide drone operations when needed. If a fire or some other incident is too small to merit federal attention, they might not have access to drones.

But if the FAA lowers the bar for operation and those governments can use drones more easily, that might not matter as much.

"That gives them information they need quicker that they wouldn't have had unless they had a bigger response," he said. "They would have had to wait for the federal government to get there."

The winning proposal from the area was from the Center for Innovative Technology in Herndon, Va., close to Washington Dulles International Airport. That proposal is broad, but will include urban and rural package delivery, mapping technology, radar and more.

READY FOR TAKE-OFF

There's a whole constellation of other possible uses for drones among state and local governments. They might use drones to inspect infrastructure. They might use them to deliver supplies to disaster victims. They could send them out to spray mosquitos with pesticide. They could grab quick imagery of a crime scene. They could map nature trails or search for missing hikers.

In fact, local governments are already doing most of those things.

The key to the future, according to Miller, is expanding their ability to do those things. If government operators can use drones above people, at night and in remote places, they could do all of those better, faster and at more convenient times.

"The benefit of UAS is mobility," he said. "You're giving mobility to things that had limited mobility before."

And as costs come down and operating restrictions get rolled back, Miller said he has a fourth D to add to the list.

"I might say dull, dirty, dangerous and democratized," he said.

http://www.govtech.com/products/Drones-Take-Flight-for-Local-Government.html