HOMELAND SECURITY EXPERTS GROUP (HSEG)

2022 HOMELAND SECURITY ENTERPRISE FORUM

LIGHTNING ROUND 4:

DRONES ON THE FRONTLINE OF HOMELAND SECURITY

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Lightning Round 4 - Drones on the Frontline of Homeland Security

MR. WALKER: Here's a great segue from the quantum panel. We talked a lot about the use of drones going forward. And not the horror novelist Stephen King. But Steve King is here to talk to us about the positive use of drones in the Homeland Security Enterprise. Steve?

MR. KING: Thanks very much for having me. So, when I tell my first responder friends that I'm going to go to, you know, someplace like Chula Vista and which is right outside San Diego, and talk to them about their drone program. Inevitably, they always do pretty much the exact same thing. And that is they say, "Oh, we have a drone program too." And they -- as if to say like, oh, just, you know, come on down the street and, you know, come see what we're doing.

What they mean of course, is when they say they have a drone program, they mean that after a dozen firefighters show up on the scene that somebody pulls a drone out of the back of the SUV, right, and launches that and they get a slightly different view of the scene or, you know, maybe on the law enforcement side they'll have some, you know, hostage situation or something like that, right? And after, again, a half dozen or a dozen officers are there on the scene, then somebody pulls a drone out and they fly it and get, you know, a slightly different view of the same scene.

That's not what we're here to talk about. So, this is Chula Vista. This is a husband and wife chasing one another. The marital bliss. They received some 911 calls. And if you're in Chula Vista when you call 911 during the day, especially, a drone operator, remote pilot stands outside the dispatch center and will launch a drone from one of four locations across the city and go investigate what's happening.

It takes the drone, what I saw was 15 seconds or so to get on scene, that's immensely faster than local law enforcement. In fact, I don't see any officers on scene in this video. Do you? So, the last time I was at Chula Vista, we walked in and it was a 911 call for a man with a gun at a middle school. Well, right, perfect timing to walk in, this is going to get very exciting. The suspect had left and was leaving school grounds in a minivan. So, the drone launches, goes, and sees the minivan. Great. Follows it to a shopping center. Okay. This could get really bad, right?

Out pops after the minivan parks, a mom and two young girls about the same age as my daughter. And all of a sudden the situation changes. You have responding officers going as you know, as fast as possible amped up to the scene about to do a felony takedown of this minivan, which is if you don't know turn the vehicle off, throw the keys out, your hands out the window, one at a time, come back to the sound of my voice, cuffed. It's dramatic if you're the suspect or that mom and two daughters. If you're a police officer, it's sort of you know, routine business.

But that experience for those three ladies was entirely different, as a result of the drone. There are other examples where another man with a gun call the drone launches can get eyes on what's happening quickly and sees that it's not a gun. It's a cigarette lighter. I'm not kidding, right? I'll make this stuff up. That's another one that we have a video of. So, officer safety, the entirely different use of drones, that's what I want to talk about.

So, I'm Steve King. And in many ways, I'm sort of a typical MITRE employee, you know, been doing this for a long time, was in government DHS for about a decade. But on weekends, I'll tell my boss, I go back to my original job, which was as a career firefighter paramedic, who went to the police academy, did arson and explosion investigation for the city. And so, I love this opportunity to bring together these two worlds of mine right now to focus on first responders and how we can use drones to improve public safety essentially.

And MITRE is charter to work in the public interest. It's a not-for-profit. We're never going to go sell drones. So, when I go and talk to the fire department or the fire chief in San Bernardino, California about ways that we can help in there huge -- county is huge by the way. It's larger than some states. I can't believe it. When we talk to them about how we can use drones, they know we're not there to sell them a bunch of drones. In fact, that's one of the things we're working to fix this, that sort of the salesmanship that goes on, the lack of transparency when it comes to drones.

Our bread and butter really is operating Federally Funded Research and Development Centers. And that gives us an opportunity to see this challenge from others perspectives. So for example, the FAA is very concerned that your flight home today is going to be safe, which is great, I think. Department of Homeland Security has given us some terrific opportunities in terms of looking at use cases, especially, along the U.S. Mexico border, which we'll talk about in a second. Our work for the National Cybersecurity FFRDC for NIST is terrific. When we look at the most common drones used by public safety, Chinese made DJI drones, 80 percent of the market share.

And our work with the U.S. Intelligence Community and DoD gives us an opportunity to leverage some work that we're doing in one domain and apply it in another. I'll give you a quick example here, the Nibbler 3D printed drone. But that's not the exciting part. The exciting part is how the U.S. Marine Corps is incorporating a 3D printed drone in their day-to-day activities. So, when they -- next time we go to war, it will either be with a Nibbler or the latest version, but at the squad level that frontline soldiers -- Marine is able to sorry, it was Army, so everybody's a soldier to me. That Frontline Marine at the squad level is able to incorporate a small drone into their tactics. You want to take that hill, throw the Nibbler across the field? If it crashes, no problem, because that gunnery sergeant is able to no kidding, take a soldering iron and make repairs or 3D print a replacement part. It's about the TTPs, the tactics, techniques, and procedures. That's what it's about. It's not about the Nibbler, because when we do go to war we're going to have a new version of that, I'm sure.

When it comes to 3D printing, it's something we've been doing for a long time. In this case, we were asked to 3D print. Well, we were asked just to build a drone and design a drone that could be built overseas using parts that were sourced elsewhere, not necessarily attributable back to the U.S. We want something that can go very fast. This is over 70 miles an hour. And it's incredibly low cost. So, when this gets lost in say the desert, right? Oh, well, it's okay, it's incredibly low cost. We'll just 3D print another one and source some more parts off amazon.com, if you would like.

In the South America, we're working with law enforcement there to help reduce the production of cocaine out of their country. So instead of sending an officer into the coca fields to have to try to spray herbicide and get rid of these coca fields, which are always booby trapped, instead now we can use a drone. So that's the MITRE team working with the local law enforcement there.

Don't let the small size fool you. So the army would categorize all these as Group 1 UAS. They're all below the 55 pound weight limit for the FAA for small drones. But if you apply a little ingenuity, a different way of doing this, you can get great distances. We've invented something called the hopper, fixed wing drone that has solar panels on it, you can launch it, fly it for a while, and then when it gets tired, it lands in the ocean and recharges. And then when it's rejuvenated, hops back up, keeps flying. Rinse and repeat. You get terrific distances out of that if you don't mind waiting a while.

So, what about first responders? That's what I'm really interested in as you know. We're doing a bunch of things. But what I want really to hear from you is your idea. So, let me throw out a couple of things that we're working on. But then after this, I would love to hear some of your thoughts, especially on the break and lunch and whatnot.

This first one -- well, first thing I need to do is change the name, because persistent over watch is a terrible name. I wanted to call it the unicorn, because to me this was, you know, the impossible. We met with a sheriff in Arizona, who said I would like – and he meant this all genuinely, right? No sense that this was a ridiculous request, right? "I want a drone that flies all day long. I want my deputies to focus on being deputies, good investigators, detectives, et cetera. I don't want them to have to be pilots and focus on piloting. Also, I don't want them to have to stare at a screen all day and look to see when illegal activity is happening. Now, I want the drone to detect that automatically and just alert them, having just send a little alert on their phone with a video." Sounds good? Oh, "And also it can't cost too much." We had a vendor out here and they flew a drone. Well, it crashed, but they said it could fly all day, it was $3 million a year.

That's like our budget. I don't -- so can we get closer to the $30,000 mark? Something closer to a vehicle we might purchase? I thought this was completely crazy. But I have to say, I think in extreme pretty certain or else I wouldn't have put a slide on it. I'm pretty certain that by the end of this year, we're going to fly that drone and it's going to do all of those things at the $30,000 mark. And that's where the thing -- where this is really different. When we talk to folks in the first responder community, the price difference is dramatic. And it's a it's a fun new challenge for us.

Typically, when people want to fly drones, they're photographers or realtors, that sort of thing. Those are the common commercial drone pilots. And the FAA has a great exam for them. It's the part 107 drone pilots. It's a written test. There's no flying portion of it. It turns out that if you want to fly a drone in a hostage situation inside a school for example, it's a different skill set. If you want to fly to do accident reconstruction after a horrible auto accident for example, and bring that into court, it's a different skill set.

So, we're pulling together the relevant partners, the police chiefs, the fire chiefs, et cetera and coming up with new and have come up with new training standards and a credentialing program to really elevate the bar. This is the one that the community, the first responder community is the most excited about. I'm excited about technology, they're excited about having finally having some training standards. So that's wonderful.

I used to run a hazardous materials team for the fire department going way back to the anthrax attacks, if anyone remembers that from a couple of decades ago. And at that time, every other Hazmat team in the country was looking for a sensor like this, that could detect biological agents. We've got to deal with these huge influx of calls for anthrax. Another -- it's another anthrax scare, I saw some dust at a grocery store, literally. Go check it out.

So what do we do? Put somebody like me into a hazmat suit, send them down, and try to do that -- try to do that detection. And so, we tried to buy sensors at the time that were great. How did we do it? I would call a neighboring fire department, "hey, what are you guys using?" All right. I trust my salesperson who had sold me a really terrific, beautiful looking fire engine just a couple of months ago. Maybe she knows the best biological detection sensor. Make the long story short, she didn't know, and my neighboring fire departments also had no idea what to do.

Well, that's where we are now with drones. Police departments, fire departments, et cetera, they say "I want to buy a drone. We want to do this. This is great, right? This is fantastic." So they asked the neighboring departments and find out what they had been using. Usually that information is a little out of date. That's something they bought a couple of years ago and it's kind of had some various issues. They asked the salespeople who aren't necessarily forthcoming, when it comes to limitations and challenges.

So MITRE is flying a tremendous number of drones. We do really detailed testing 12 flights for about 30 minutes each to really understand the drones. And we take that information and we will provide it on something called the drone selector. This is an ability for any public safety agency to go in, entering what their needs are. If for example, you are a public safety agency in Florida, you have a limited number of drones that you're even allowed to fly. All of that kind of information, whether you need to carry something, thermal imaging, infrared, et cetera, all of that goes into this and we provide you a subset of drones for you to look at.

I mentioned my experience doing hazardous materials investigations. There's no reason 20 years later for us to still have to put someone like me into a level a hazmat suit and go downrange with a handheld sensor, where we for 50 bucks, we basically come up with a new solution that allows departments to incorporate the handheld sensors they have now for hazardous materials detection, fly drones into a scene and come back. That's the wave of the future.

We have a lot of things that we want to work on. But as I said, I'm really most interested in hearing your thoughts and answering your questions about drones. So, we have a couple more minutes left. I'd love to hear any thoughts you have or concerns you have about drones. I will say that's the number one reason why public safety drone programs fail, because community is not involved. And they're -- they shut it down. There are ways to address those community concerns, but many departments don't realize it and we would like to help them with that. Sir?

UNIDENTIFIED SPEAKER: One of the big issues that are facing a lot of departments on use of drones is the backlash from the community about privacy concerns. What can be done to address that? I mean, people walk outside and they're expecting privacy walking outside and have a hard time with it?

MR. KING: That's right. (Cross talk)

UNIDENTIFIED SPEAKER: Capturing that concept.

MR. KING: That's right. That's exactly right. I agree completely. So one is to make sure that drones are being flown by law enforcement for a specific reason. So no flying -- if you're going to do training, no flying around neighborhoods, right? Ideally, and this does happen right now. If you're in Chula Vista and you look up and you see a police drone flying by, you don't have to wonder what in the world is going on. You can pull out your phone, look on the website and see what 911 call they are responding to and where it is. So, there's no doubt in your mind about why they're flying. That's terrific. That's number one.

Number two is the video. What are we doing about this video, are we recording it, are we keeping it someplace, what's going on with that? Well, it turns out that this problem has been in many ways solved or addressed at least. And that is with officer worn body cameras. That is capturing video all the time. What are we doing with that? Those same protection standards, those same issues about FOIA ability, all of that that applies to body worn cameras also apply to drones. So there -- and community engagement beforehand, they're actually multi-step process that we advocate, but those are some of the top topics. Yes, sir.

UNIDENTIFIED SPEAKER: Yes, thank you. What is being done in the certification process, the recertification process, in particular how many hours per month as a drone operator have to fly? Could you give us some details about your vision on how that can be codified and expanded through the law enforcement?

MR. KING: Yeah. I appreciate that. So, as you probably know, right now, the answer is basically nothing. There's you know, two hour -- there's a written exam, excuse me, that the FAA requires that the realtor down the street also needs to complete and the photographer right here also needs to complete. And that's it, right? So that's where we are. As you know, that's woefully inadequate, right? So what we have is a vision for a essentially, a 40-hour course to get to get started, that starts with that initial certification already in hand. And as well as the NIST certification course again, already completed and builds upon that to deal with things like the privacy issue that you asked about, which is terrific, right?

Deal with those kinds of issues in the training program and ensure hands on with certain modules specific to flying over an auto-accident is to do accident reconstruction and submit that data for the courts is entirely different than flying with a SWAT team going in using the drone to break glass push open doors, when you have a warrant.

Those are entirely different piloting experiences. So our training will incorporate that. And when I say our training, I don't mean MITRE specifically. I mean, the broader community. And that's one great thing about this role is that we really are working with genuine partners, who know that we're not out to, you know, again, to sell them a drone or to manufacture anything for them. We really are collaborating with them. And it's public safety wide. So 2 hours, 40 hours to start with. Yeah. Yeah.

UNIDENTIFIED SPEAKER: What about maintenance? Are you tackling the maintenance issues making sure that that is all captured, you're monitoring the drone, and you're being able to collect warnings and indications of failures of particular parts, so that you can get in front of that, so you don't have an accident where someone might be injured, et cetera. Is that part of the work that you're doing with the police?

MR. KING: Yes, absolutely. Interestingly enough, that video that I showed from Chula Vista, at the time they were using a pretty good commercial off the shelf drone, but the darn thing did crash twice. And what they determined when they went back to DJI, I mentioned that, you know, again, Chinese made manufacture drone. When they went back to DJI, DJI said, "We never envisioned that someone was going to fly this thing all day, day in and day out. Like that was not how we built this. This is you know, for hobbyists or for flying, you know, maybe a half hour to take some pictures or something like that once a week at the most."

So the newer version, the newer model made some necessary changes to the motors to the engine. So now if one engine goes out, it still stays airborne. But yes, that's an issue as well as battery life and some of the technical aspects are incorporated into the training program, so absolutely.

UNIDENTIFIED SPEAKER: Thank you.

MR. KING: I see we have one more question. I'm technically out of time. But if Rob or whatever his name is, won't yell at me, I will.

UNIDENTIFIED SPEAKER: Thank you. Frank Sandhoff (phonetic) from Microsoft. You know, it seems like the skies will be getting crowded between recreational business law enforcement. We have flying cars literally coming as well. So between state, local, federal, who controls the airspace and who's going to manage the collisions and what have you, like? How is that being orchestrated?

MR. KING: Yeah. It's absolutely the FAAs responsibility, which is one reason why I'm excited that we're also in our role supporting the FAA, for R&D. But yeah, that's absolutely the FAA. And that concern that you just mentioned, is why things have been a little slow to get going in terms of the technology is there, but the safety case hasn't necessarily been made yet or took a while to get made. And I think we're finally right there, but it's a great -- it's a great concern and it's one we share. I'll leave it at that.

Thanks, Rob.

(Applause)

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