

I'm Bob Griffin. I'm the Deputy Under Secretary at the Department of Homeland Security Science and Technology Directorate. I'm a former fire chief, I'm a former emergency manager, I came from local government, and I'm going to spend the next 20 minutes talking to you about my passion. And my passion is improving the safety and effectiveness of our first responders.

So I'm going to do that in three ways: I'm going to tell you a story, I'm going to talk to you about what science and technology is doing in the wearables and data field, and I'm going to talk about how we can work together to move this revolution forward.

So let me ask you a simple question: How many of you have been in a life or death situation? A few of you. How many of you have been in a near accident situation where your adrenaline spiked? Was the first thing you thought about data? (Laughter) Yes? No?

Let's talk about this for a little bit. Let me lay this scenario out for you: It's a lovely Tuesday morning in the fall. You're at a conference about wearables. You could listen to some dude from DHS talk or you could go for a hike. You go for a hike, probably a good choice.

The sun is out, the leaves are rustling, the birds are chirping, the smell of apples are all around you; it's a Disneyesque moment. You congratulate yourself on a wise choice.

However, you come around the corner and you see this. ROAR. This isn't a nice cuddly bear, this is a big hungry angry bear that wants to eat you. Your response is flight or fight.

Are you thinking about data? Yes and no. Let's unpack this a little bit.

This, is not the data you're thinking about. It *is* an incredibly important map. It shows state boundaries and county boundaries. It shows accessible roads, inaccessible roads, semi-accessible roads, planned roads, possible roads. It shows bear habitats. It's a work of art and science bringing together huge amounts of data. It's incredibly complex. It's incredibly powerful. It's incredibly important, and it requires two 21-inch monitors in order to really view it well.

So, as you're pulling your lighter-than-air laptop out of your backpack—the 21-inch one—in order to appreciate the majesty of the information that is shown here, the bear eats you. Now we go to your funeral, we say nice things about you, even though you will always be that dude that went for a hike and got eaten by a bear.

The data let you down. What you really needed was something that said, "Run to the left." Really what you needed was something that said, "Run to the left quickly, fool, or you are going to be a big Bob bear burger."

What we need to do is take all of the big data that you saw on that other map, figure out how to validate it, figure out how to distill it, figure out how we make it little data that we can operationalize in order to save lives.

So in order to survive the bear, you need data at the speed of thought. You also need mechanisms that can receive that data. So when I said to you, "Do you think of data when you're in a life and death situation," that's kind of a trick question cause in reality, first responders are using data all the time. They're rolling up on a scene, they're doing an evaluation, they're thinking about the typography,

they're thinking about the weather, they're thinking about the conditions, they're thinking about the risk and threat, and this is all happening at the speed of thought.

So what we've thought about when we start to think about data and wearables, we think about what we call the three "I's." To be operationally essential—excuse me, to be operationally relevant, let's start there—data and wearables must be intuitive, instinctive, and interoperable. By intuitive, I mean, you must be able to put it on and use it and understand it quickly. When I'm being chased by a bear, my attention needs to be on survival—it can't be on how to make a system work.

When I talk about instinctive, there's physiological, there's psychological, but there's also professional instincts that we train into our people, ok? I'm a former fire chief. Sane people don't run into buildings. I recognize that. But I need data that's actually going to help me run into buildings and let me stay there as long as I possibly can in order to try to save as many people as I can. It's counterintuitive to common sense.

So, if I'm receiving data that says, "Hey fat boy, go run up the hill because the bear's behind you," that's probably not the type of information that I'm going to need. It needs to be interoperable. It needs to work with existing systems. And we also have to start to think about how we weave future systems into this web of possibility. And in order to be effective, the data needs to be wearable. I have to be able to bring it to the people in the field or else it doesn't matter.

So let's talk about what this looks like. I had a great laser pointer that got taken away from me in Sweden; apparently if you go to Sweden you can't have laser pointers, so my laser pointer's gone. You look at the upper left-hand corner and it says that's where you are, and the basic information that you start to receive is that you gotta run like hell, you've got a big bear chasing you.

You've got different options: you could go to the "Hunters R Us," which is maybe 100 yards down the road or 200 yards down the road you can go to Grizzly Adams' peanut bear hut. Maybe you didn't want to trap the bear, maybe you just wanted to see if you can feed it and let it go away.

It sounds easy but there are millions of calculations that have to go into that information, including my athletic ability, the topography, the weather. And what I really need to know is, "You know guy, real quickly, you got about a 50 percent chance of making it to Hunters R Us; you got about a 20 percent chance of making it to the peanut butter hut, so if you're really thinking about the peanut butter hut, you may want to think again."

What we also have to do, is we have to figure out how we can take out the noise. Because on the map if I see the bunny slope and I'm trying to figure out what the hell the bunny slope means, what happens? I get eaten. So we recently held an exercise in the central part of the United States dealing with the New Madrid fault—there's a huge fault that runs through the center of the United States. And they were able to actually map 2,000 different layers of data.

So here's a question to y'all: What do you get when you map and visualize 2,000 layers of data? You get crap on a map. Okay, and crap on a map isn't helping operations. This is the challenge and opportunity we have when start to think about data and we start to think about standards and we start to think about wearables.

So let me talk a little bit about what we're doing at the Science and Technology Directorate. We have held a national conversation on homeland security science and technology in order to develop stretch goals for the directorate. What does 20 or 30 years look like in the future? And we came up with five, and some of you actually in this room participated with us, and I appreciate that. What we're looking to do is trying to change how we think about R&D, help industry understand where some of the priority areas are, and see how we can improve homeland security, so we've got five.

We're looking at how we can make screening that matches the pace of life rather than life matching the pace of screening as we've seen sort of in a post-9/11 world.

How do we create privacy in commerce and in community, in a cyber-protected world?

How do we disaster proof a community? How many of you have disaster proofed a house for a child? Child proofed a house? How do we do that for a community?

We're also looking at two that I want to draw attention to for you all: How do we make actionable information at the speed of thought? Cause we're talking about operational speed, so how do we put algorithms and science together with wearables and equipment to be able to bring actionable information to the field to make it operationally relevant? And how do we create a protected, connected, and fully aware first responder of the future?

These are really cool opportunities that we're putting resources and time and money and conversations into.

So let me talk about how we're going to do this, ok? We're taking it a bite at a time. We're kicking off a program—Jay Martin, head of the First Responders Group is here with us today—on the real-time actionable information for first responders. Really what we're getting into here is, how do we bring wearables to the first responder community? Now I want to talk to you a little about that.

It's probably not something you see every day, a fed stripping on stage, or if you do, you probably shouldn't talk about it. I'm going to put my friend on. So, this is my friend. My friend's been into 1700-degree fires, my friend was at the Pentagon after 9/11, it was at the Dulles mail facility after the anthrax attack, it's been in hazmat situations, it's been bled on, it's had people die in its arms, it's been vomited on, it's my wearable, it's kept me alive. When I start to think about what more my friend can do for me, what both my friends can do for me—this is the promise of wearables.

Can we weave something that increases the gain of my communications equipment into my jacket? Can we measure my vital signs so that the people who are outside the fire know that I'm panicking? Know that my heart rate is starting to spike? Know that my heat, my temperature is too high? Know that I'm dying so they can come get me? Can this protect me from a multitude of different threats? Can it be connected to multiple different sources? Can we standardize power sources that will run multiple different sensors? This is the promise.

We start to think about wearables. This is what it's all about. Because we can save lives and we can improve the effectiveness and efficiency of our first responders, and that helps all of us.

Can we bring pictures to my faceplate? Can we bring pictures back so that policymakers can understand what I'm going through? This, again, is the potential for wearables of the future. And this is why we need all of you working with us.

It's a huge potential market if we can think about it. It has the potential to help us as athletes, as people, as first responders. We have the potential to think differently of how we administer drugs in an emergency situation. How we tailor our approaches to emergency medicine. And it's at our fingertips if we can pull it together.

I'm going to conclude with how you can work with us. So on November 19th—17th, excuse me—we're going to kick off a new website. It may not sound like it's exciting but in the federal government, I'll tell you what, it's a big deal (Laughter). We based the S&T reach goals that I talked about earlier on a national conversation. We're going to be kicking off a national dialogue, many national dialogues, but the first national dialogue is actually going to be about wearables because we see this as a way that we can revolutionize operations, both at the state and local and with federal and first responders. We're going to be putting out prize competitions, tech acceleration, and we're going to be trying to work with each and every one of you in order to figure out how we can bring wearables to the field.

Just do me a favor though as you look at this and understand when I'm in a 1700-degree fire, I can't pull up my sleeve to look at a wearable. I can't take on any more weight because any ounce of weight that you put on me means that I'm less likely to be able to carry you out of a bad situation.

At the same time, if we can start to think how to integrate and connect, you can help me do my job in ways that I have never imagined. And for that I thank you and tell you that I can't wait to work with you and be part of this revolution because it's going to be amazing. I'm Bob Griffin with the Department of Homeland Security. Thank you for your time.