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AT ILLINOIS INSTITUTE OF TECHNOLOGY REAL-TIME COMMUNICATIONS
CONFERENCE**

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Thank you, Mark, for that introduction. More importantly, thank you for your partnership. Mark is something of a fixture at the FCC, serving on various task forces and advisory committees over the years, not to mention fighting for causes like Kari's Law. Mark Fletcher is around the FCC so much, he's apparently gotten a nickname. At the FCC's last open meeting, one of the Commissioners jokingly referred to Mark as, get this, the "troublemaker." Of course, it was meant in an endearing way. I'm thinking George Clooney in Ocean's 11—a mischief-maker who ruffles feathers that need ruffling. Nicknames aside, I know one moniker that Chairman Pai would proudly use for Mark Fletcher is friend. On the Chairman's and the Commission's behalf, I'd like to thank Mark for his many contributions to make 911 work better for all Americans.

Also, thank you to the Illinois Institute of Technology for hosting us. It is an honor to be here to speak before the best and brightest at this fantastic conference.

Today, I want to share with you a snapshot of what the FCC under Chairman Pai's leadership is doing to leverage technology to promote public safety.

I hope you will leave here with an understanding of the policies that we are pursuing at the Commission. As important, I hope you will leave with an appreciation for Chairman Pai and the Commission's commitment to improving public safety through communications technology.

As the Chairman's public safety and consumer protection advisor, I clearly have an interest in saying that public safety sits atop the Commission's list of priorities. But you don't have to rely on my admittedly biased opinion.

First, look at the law. Section 1 of the Communications Act, which established the FCC, charges the Commission with, quote, "promoting safety of life and property through the use of wire and radio communication." The FCC's public safety mission goes back to its founding statute and remains a core part of our DNA.

Second, look at the news. Seemingly every day, we are reminded of the vital role that our communications networks play in times of emergency. Hurricane Michael is the latest natural disaster to put our emergency response systems to the test. As with other natural disasters, affected areas have seen both networks outages at the same times as surges in 911 calls. The FCC continues to work with our federal partners and the private sector to ensure that communications services are restored in those areas affected by Hurricane Michael. Substantial progress has been made, but work remains to be done, especially in the area where the hurricane made landfall.

Unfortunately, Michael is just the latest and not the last deadly storm. I can assure you that the Commission will be doing everything in our power to make sure our communications networks are resilient in times of crisis. Nothing is more important than making sure our networks work when they are needed most, and lives are at stake.

The third thing I would suggest you look at to appreciate Chairman Pai's commitment to public safety is his travel schedule. This is not my first visit to Illinois since joining Chairman Pai's office. In September 2017, the Chairman and I visited a 911 call center in Harrisburg, Illinois with Congressman John Shimkus. As this audience knows, it can be expensive and difficult for a single town or county to

maintain a 911 system. Upgrading a system to Next Generation 911—essentially an Internet Protocol-based 911 system—is too often impossible for a smaller, cash-strapped jurisdiction. In Harrisburg, we were impressed to learn that local leaders across over a dozen rural counties had come together to leverage resources to deliver first-rate public safety service by creating a regional Emergency Services Internet-Protocol Network.

This is just one of many examples of Chairman Pai leaving DC to meet emergency responders in the field and to get first-hand insight into the opportunities and challenges they face as we transition to Next-Generation 911. In fact, on that same trip in September 2017, the Chairman and I visited PSAPs in Joplin, Missouri and Wichita, Kansas. Just last month in Hartford, Connecticut, Chairman Pai met first responders at the cutting edge of deploying NG 911 technologies. These travels have not only informed the Chairman's work on public safety, they've galvanized his commitment to getting this issue right.

Here's the bottom line: communications in times of crisis can be a matter of life-and-death importance. The Commission treats it as such. Accordingly, the Chairman has prioritized public safety, and we are doing everything we can to leverage technology to save lives as part of our public safety mission.

So, let's talk about the actual policies we are advancing at the Commission. There's no better place to begin than with 911.

This year marks the 50th anniversary of the first 911 call. It was a landline call because 50 years ago that was the only kind of call one could make, and the 911 system was initially engineered as a landline system. Fifty years later, 911 has evolved into a largely wireless system—75 to 80 percent of 911 calls are wireless— and now we face the challenge of transitioning this architecture from legacy to IP-based Next Generation 911.

Let's take a deeper look at how the FCC is working to improving 911 access and response.

First, location accuracy.

As with real estate, “location, location, and location” are the touchstones of effective 911 service: First responders must know where the emergency is. In 2015, the Commission adopted wireless location accuracy rules to improve wireless E911 location in indoor environments. Consistent with long-standing FCC policy, we made the rules technology-neutral: carriers have to meet our accuracy standards but the only technology specification in our rules is “use technology that works.”

The result is that we are seeing an explosion of innovative 911 location solutions that leverage recent improvements in technology. Where carriers have traditionally relied on assisted GPS for 911 location, carriers are starting to move to “device-based hybrid”, or DBH, solutions. DBH leverages the capabilities of smartphones to self-locate based on proximity to Wi-Fi hotspots and other reference points. CTIA recently announced that by the end of this year, all four nationwide carriers will integrate DBH into their 911 location solutions for both iPhones and Android phones.

The carriers are also building the National Emergency Address Database (NEAD), which will support “dispatchable location” for wireless 911 calls—that is, instead of ‘x,y’ coordinates, the PSAP will receive street address, floor level, and apartment, suite, or room number. The FCC will also soon start a proceeding to determine an accuracy standard for z-axis, so that coordinate-based location in multi-story buildings will include a vertical metric.

Recent testing in the CTIA test-bed showed the potential of using barometric pressure sensors—a standard component of most smartphones—to provide a z-axis fix. Other technologies may also support z-axis location. Our Public Safety and Homeland Security Bureau recently sought public input on possible approaches, and staff are now reviewing the comments.

The next major area we are working on involving 911 is location-based routing. Here is the problem: Currently, if I were to make a wireless 911 call from my office—located in D.C. just across the

Potomac River from Virginia—there's a good chance it would be received by a cell tower in Virginia and routed to a Virginia PSAP. When that happens, the Virginia PSAP must call the D.C. PSAP to transfer the call. But all this takes time, and a delay of even a minute can be the difference between life and death.

In 2016, the FCC tasked an advisory committee to look at the technical feasibility of location-based routing—that is, routing 911 calls based on the caller's actual location, not the location of the cell tower receiving the call. This panel of experts found that there were promising technologies that could potentially support location-based routing, and recommended the Commission explore the issue further. Following up on this work, the Commission adopted a Notice of Inquiry on location-based routing in March 2018. With the information developed from the feedback, we've received, we are working on ways to leverage technology to route 911 calls more quickly and accurately and reduce the need for transfers from one PSAP to another.

The Commission has also been busy implementing new laws to help make 911 even better.

The first of these legislative actions is Kari's Law. Many of you have heard of the case in which a woman—Kari Hunt—was attacked and killed in a hotel room when her daughter was unable to dial 911 because she did not know that the hotel required dialing “9” first to get an outside line. Thanks to Congressional action and President Trump signing the bill into law, we have a path forward to ensure that such a tragedy does not happen again.

Under Kari's Law, multi-line telephone systems—the kind found in many hotels, businesses, and campuses—will be required to allow users to dial 911 directly, without having to dial a prefix to reach an outside line. Kari's Law also requires that when 911 calls are made from a multi-line telephone, notification will be given to a front desk or security office to allow first responders to enter the building. In moving testimony before the Commission last month, Kari's father, Hank Hunt, called on the FCC to adopt rules implementing Kari's Law immediately. As I referenced in my opening, Mark Fletcher also played a key role in the law's enactment and attended the FCC's meeting. I am proud to say that the Commission voted unanimously to launch a rulemaking and get new protections on the books as soon as possible.

In the same action, the Commission also proposed to ensure that 911 calls from multi-line telephone systems convey “dispatchable location”—street address, floor level, and apartment, suite, or room number—to the PSAP. This element of the Commission's action was pursuant to a section in the recently-enacted RAY BAUM'S Act, which requires the Commission to conduct a rulemaking on dispatchable location for all 911 calls “regardless of the technological platform used.” So the Commission is not only looking at dispatchable location for multi-line telephone systems, but also at dispatchable location for all 911-capable platforms, including wireline, VoIP, and TRS.

Stepping back from 911, the second major area where technological advances have completely re-shaped the “art of the possible” is emergency alerting.

The Emergency Alert System, or EAS, is one of our oldest public safety communications systems. As technology has advanced, the Commission has sought to improve EAS and make sure it keeps pace with the times. Recently, the Commission adopted an order that will lead to important EAS improvements, including improved test procedures and safeguards to reduce the likelihood of false alerts. More improvements to EAS will be possible when broadcasting transitions to ATSC 3.0, a new transmission standard which will enable embedding of data streams in the broadcast signal that public safety officials can use to deliver separate, specific data both to the public and to public safety personnel.

Of course, emergency alerts are only effective if they meet people where they are. In 2018, more and more Americans are on their wireless device. That's why Wireless Emergency Alerts, or WEA, have been a game changer. This added a major new tool to the alerting toolbox to complement EAS alerts over broadcast, cable, and other media. WEA alerts save lives: tornado alerts have warned people in the immediate path to take shelter, and AMBER alerts have led to many successful recoveries of abducted or

missing children. But so-called first-generation WEA has its limitations: alerts are limited to 90-character text messages and geo-targeting of alerts can be over-inclusive and imprecise. Advances in technology are now making it possible to provide more information in WEA alerts and to geo-target alerts more precisely.

In an effort to address some of the shortfalls in WEA, the Commission has acted to require carriers to begin implementing WEA upgrades. By May 2019, wireless providers must support WEA messages of up to 360 characters, Spanish-language messages, consumer-facing tests of WEA, and a new Public Safety alert message category. This follows improvements we made in 2017, such as requiring the major wireless providers to support "clickable" embedded links in alerts, which enable recipients of an alert to click on a URL to access additional information.

By November 2019, wireless providers must improve geo-targeting by delivering alerts with no more than a tenth of a mile overshoot from the affected area specified by alert originators.

As many of you may have experienced firsthand, just two weeks ago, on October 3, FEMA, in coordination with the FCC, conducted a nationwide test of both EAS and WEA—this was the first time both systems have ever been part of a joint nationwide test. Regular testing of our alerting systems at the nationwide as well as the state and local level is just one way the FCC helps to ensure the reliability of these vital systems. Commission staff is still reviewing the national test results.

To this point, I've talked about the FCC's commitment to public safety and the actions we've taken to fulfill that commitment. The last point I want to make is that the FCC can't improve public safety alone. We need input from technical experts, like yourselves, to help ensure that we are taking every opportunity to leverage technology as we exercise the Commission's role in "promoting safety of life and property" for all Americans. It's not just the law. It's the right thing to do. I look forward to working with you to save lives and build safer communities.

Thank you.