

Written Statement
of

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“Resilient Communications: Current Challenges and Future Advancement”

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Good afternoon, Chairman Bilirakis, Ranking Member Richardson, and other Members of the House Subcommittee on Emergency Preparedness, Response and Communications. Thank you for the opportunity to appear before you to discuss the Federal Communications Commission's (FCC's) efforts to enhance public safety by making critical communications infrastructure more reliable and resilient, including America's 9-1-1 system.

INTRODUCTION

The Commission is committed to working with its public safety partners, communications providers, and others, to ensure the integrity and reliability of our communications networks and services. It is essential particularly in times of major emergencies, such as during and after a natural disaster, that communications networks keep us connected to each other and to the help we may need.

When Congress created the FCC in 1934, it made one of the Commission's foundational obligations, "the promotion of safety of life and property through the use of wire and radio communications." In the years since, consistent with this mandate, the FCC has applied Congress's public safety charge to changing communication technologies, including, most recently, phone calls made over a broadband Internet connection instead of typical analog telephone lines (i.e., interconnected Voice over Internet Protocol, or "VoIP.") In fact, Congress recently reaffirmed the FCC's core mission and its approach by codifying the requirement that interconnected VoIP providers provide 9-1-1 services.

To fulfill its mandate under the 1934 Communications Act, the FCC, primarily through its Public Safety and Homeland Security Bureau, works hand-in-hand with our Federal, state, local, and tribal public safety partners, to enhance the reliability of our nation's communications infrastructure. Nowhere is our responsibility to promote public safety more important than with regard to 9-1-1 services and availability. While we are always very concerned whenever there is a substantial communications outage, we are exceptionally concerned when an outage affects the public's ability to obtain help through 9-1-1.

Today I will focus my discussion on the impact of-- and the FCC's response to-- the recent derecho storm that hit parts of the central, mid-Atlantic and northeastern United States in late June. I will also touch on the Commission's response to Hurricane Isaac just two weeks ago, as well as efforts the FCC has taken to make our nation's critical communications infrastructure more resilient, and the challenges that lie ahead.

THE JUNE DERECHO STORM

The Derecho's Impact on Communications

On June 29th, a fast-moving and extremely severe derecho weather system dramatically affected emergency communications over wide swaths of the United States. Starting in the Midwest and increasing in ferocity through the mid-Atlantic and Northeastern regions of the country, the derecho left death and destruction in its wake. Ohio, Kentucky, West Virginia, Virginia, Maryland and New Jersey reported deaths; and these and other states reported billions of dollars in physical damage and severe adverse economic effects. Millions of people lost electrical power during and after the storms for periods ranging from a few hours to over a week, all during a historic, record-breaking heat wave. Many needed help urgently, as live electrical wires came down, trees crushed occupied homes and vehicles, and other emergencies unfolded.

In many areas, communications services held up very well. The vast majority of those in the path of the derecho were able to continue to use wireline and mobile communications networks effectively and reliably: to make calls, reach 9-1-1, and get help. The great majority of Public Safety Answering Points (PSAPs, which are 9-1-1 call centers) were able to receive calls and location information, and to dispatch help accordingly. Dedicated radio services for the public safety community and first responders also seem to have been mostly unaffected by the storm.

The broadcast industry performed well. As FCC Commissioner Pai noted, broadcasters played a "critical role" for those impacted by the storm - when "electrical power, cell sites, and broadband networks went offline, battery-power radios served as a lifeline connecting many of us to the outside world." For me, in addition to numerous other sources of information on conditions and developments, I listened to WTOP, the Washington D.C. area news station.

While this was the "bright side," there also was another side, which showed clearly that telecommunications networks lacked needed and vital resiliency. For various lengths of time, millions lost the ability to reach 9-1-1 operators who could dispatch needed help. Some of those who attempted to make emergency calls found their wireless service unavailable or their calls blocked. Call volume increases during and after natural disasters, and this fact combined with cell site and other outages complicated efforts to originate calls to secure emergency help.

The FCC is particularly concerned that carrier network failures hit some 9-1-1 facilities especially hard. There were isolated, short-lasting network breakdowns in Ohio and Indiana that knocked out 9-1-1 service, but longer lasting systemic failures elsewhere. Most notably, in northern Virginia and in West Virginia, as a result of carrier network failures, a significant number of 9-1-1 call centers couldn't receive 9-1-1 calls at all, or didn't receive E9-1-1 location information to enable proper dispatch. Even when *some* connectivity was restored, 9-1-1 service was partially down for several days in many call centers due to carrier failures.

The seriousness of the situation was illustrated most clearly throughout northern Virginia, particularly in Fairfax County, parts of Prince William County, Manassas Park

and Manassas, where well over 1 million people faced the possibility of not being able to call 9-1-1 successfully. In Fairfax County, for example, these carrier network failures affected both primary and backup 9-1-1 systems. The result was that the 9-1-1 call center serving most of the 1.1 million people of Fairfax County couldn't receive any 9-1-1 calls **at all** for several hours. Emergency officials have told us that about 8 hours *after* the storm hit, from 7:30 in the morning on Saturday, June 30, until 3:00 PM later that day, the carrier failures left Fairfax County *wholly* without 9-1-1 service – just as people were beginning to wake up and assess the damage, report downed wires and trees to authorities, and begin the clean-up process. Even after arrangements for rerouting 9-1-1 calls finally were made, 9-1-1 service was significantly degraded for days—in fact, 9-1-1 features that we all now take for granted and which public safety officials rely on, like automated number and location identification, were not fully restored everywhere for days.

Similarly, West Virginia experienced serious problems, with even more, but generally smaller 9-1-1 call centers knocked out of service by carrier network failures. Many of the 50 9-1-1 call centers in West Virginia were adversely affected.

Public safety officials from all of the affected areas tell us they relied in part on broadcasters and social media, (particularly Twitter, Facebook, and e-mail sign-ups) to get the word out on how to contact emergency services. These officials, in light of the utter loss of connectivity to 9-1-1 services, were sometimes reduced to telling people needing help to walk to their nearest police station or fire house – a completely unacceptable position for these first responders and the affected communities.

The public's inability to reach 9-1-1 and obtain emergency assistance during the *derecho* was not just a theoretical or abstract concern, nor is it such in connection with other natural disasters. This is well understood by those who serve our country by answering 9-1-1 calls, first responders who risk all to save others, hospital workers who try to save lives, and even by those who work to make communications networks more resilient. Whether and how fast help can be called and a first responder arrives might make the difference between a life lost or the possibility of a healthy future. As the *Washington Post* reported, in Falls Church, Virginia, Dylan Cooper perished after he was struck by electrical wires brought down during the *derecho*. Bystanders who came to his aid and called 9-1-1 reportedly were not able to get through, even after calling for over 30 minutes. In another instance, just a few hundred feet from her Washington D.C. apartment, a woman was knocked off her motorcycle and pinned under a tree, leaving her partially paralyzed – she was saved when passers-by, unable to get through to 9-1-1, flagged down an ambulance which was able to provide additional help.

The FCC's Response

In responding to the *derecho*, the Commission worked very closely with the Federal Emergency Management Agency (FEMA) and others, to monitor and respond to the communications outages caused by the storm, including those severely impacting 9-1-1 services.

In doing so, we utilized the FCC's Operations Center, which is staffed 24 hours a day 7 days a week. We engaged in direct outreach to carriers and other affected by the storms. We collected key data, supported by pre-established information reporting protocols. We issued Situation Reports, providing our government partners with details of the damage and the pace of recovery.

We also took immediate action to help lessen the impact of the storm. For example, we granted an emergency Special Temporary Authority the day after the derecho struck, so that a utility company from out-of-state could go to Ohio to help restore power there, and communicate using the frequencies that their communications equipment supported. We also used the FCC's web-site and social media to issue a set of consumer tips for communicating during an emergency.

Immediately after the impacts of the derecho on communications and 9-1-1 services dissipated, the FCC began an inquiry through its Public Safety and Homeland Security Bureau to learn all of the facts and circumstances of the outages and disruptions in service, including the causes. The inquiry covers both disruptions that affected the 9-1-1 call centers and those that affected cell sites, network interconnection, switches, and other facilities. The latter impedes the effective use by consumers of wireline, wireless, and broadband communications to reach emergency providers in and after a natural disaster, when more consumers than usual need to do so.

The goal of this inquiry is simple—to use this information to make people safer. We want to enhance public safety by applying the lessons learned to help make communications more reliable and resilient, and reduce the chances that these failures will be repeated. As FCC Commissioner Rosenworcel aptly put it: “the agency has a duty to search out the facts—wherever they may lead. Then we can apply the lessons we learn and make our networks more resilient, more secure, and more safe.”

Although local, state and regional governmental entities are primarily responsible for supporting and operating 9-1-1 services and providing radio communications for first responders, our inquiry is particularly important: only the FCC can follow the full path of the storm and bring communications expertise, statutory responsibilities, excellent industry contacts, and public visibility to the entire range of communications issues it raised. Moreover, as noted earlier, Congress has given the FCC authority to ensure that communications networks, including those that offer interconnected VoIP service, promote the “safety of life and property.”

To aid our core mission, the Commission has been seeking helpful information and views from a broad range of stakeholders. On July 18th, we sought input from the public and interested parties by issuing a Public Notice, asking for information not only about the derecho, but also about other similar disasters where 9-1-1 or other emergency services were affected. We received reply comments just last week, which we are currently reviewing. This effort is distinct from, but complementary to, a pre-existing inquiry into the overall resiliency, reliability, and continuity of American communications infrastructure and services, when exposed to catastrophic events.

We began our derecho-related inquiry by conducting a series of meetings that is still ongoing. We have spoken directly with a wide range of stakeholders, some several times, including 6 different communications service providers, 25 different 9-1-1 call

centers in the most severely-impacted areas of Virginia and West Virginia, and numerous public safety officials, including those working for Federal, state, local and tribal governments.

We also continue to assess and evaluate important information submitted to the Commission on a confidential basis through two key FCC systems, the Network Outage Reporting System (NORS) and the Disaster Information Reporting System (DIRS), both of which provide vital outage and critical infrastructure status information during times of crisis.

Although we are still conducting our inquiry and reviewing the record, we have already learned, for example, that not all carriers have exactly the same problems in providing reliable 9-1-1 networks. To provide just a couple illustrations:

- not all carriers adequately monitored and implemented important best practices and technical announcements from standards organizations that specifically target reducing 9-1-1 carrier network outages. Thus, the development of standards voluntarily may well be a good idea, but it is not a panacea.
- there are some important differences on how carriers ensure that necessary redundancy is preserved in the routing of emergency circuits, including the circuits that carry location information; on a going-forward basis, we are particularly interested in how carriers conduct audits to enhance that redundancy.

After we have completed a full review of the record, and before the end of this year, we expect to produce a public report on what we learned from the derecho.

We are also mindful that we need to consider not only highly specific fixes that will result in improvement to the systems affected by the derecho, but also whether more systemic improvements are needed in our 9-1-1 system generally. The public safety community is rightly concerned that 9-1-1 has been adversely impacted repeatedly by carrier network problems. Even though the root causes may not be precisely the same in each instance, we need to explore whether there are solutions that can lower the risk of 9-1-1 failure generally.

IMPACT OF HURRICANE ISAAC AND FCC RESPONSE

I would also like to mention the communications impact of and the FCC's response to Hurricane Isaac, which hit the Gulf Coast region just two weeks ago. Unlike the powerful, unanticipated and fast moving derecho, Hurricane Isaac followed the pattern of a typical hurricane and provided carriers with more lead time to mobilize their response and reroute call traffic to avoid major outages.

Isaac severely affected the northern Gulf Coast region and caused deaths in Louisiana, Mississippi, and Florida. Though almost a million people in the affected states were without electrical power at the height of the storm, and preliminary estimates are that it caused \$1.5 billion in damage, we are thankful that, in contrast to the derecho, we have received no reports of any 9-1-1 systems being completely knocked out in the region where Isaac hit.

Beginning even before the hurricane hit, the FCC, in consultation with its Federal partners, most notably FEMA, activated DIRS to gather and monitor information for select, targeted counties and parishes in Florida, Alabama, Mississippi, and Louisiana.

The FCC staff worked tirelessly before, during and after the storm, including through the entire Labor Day weekend, compiling and analyzing this information and preparing daily Situation Reports to inform our governmental partners in detail of the state of communications services in the selected areas, which is vital knowledge in setting public safety and restoration priorities. This information identified, among other things, the extent of outages and the pace of recovery experienced by wireless and wireline carriers, broadcasters, cable providers, PSAPs and others. The FCC's 24 x 7 Operations Center assisted in these efforts.

The FCC also:

- identified 9-1-1 call centers and broadcasters in Puerto Rico, the U.S. Virgin Islands, Florida, Alabama, Louisiana, and Mississippi to determine their operational status and to assist with provisioning any needs to help maintain or restore their operations;
- conducted outreach to Federal partners, emergency operation centers, the National Association of Broadcasters, Association of Public Safety Communications Officials (APCO), and National Emergency Number Association (NENA), the 9-1-1 association;
- deployed, at the request of FEMA Region IV, two Roll Call Teams to conduct spectrum scans along Florida's Gulf coast, and in the States of Alabama and Mississippi. (In a hurricane situation, Roll Call teams use spectrum analyzing equipment to develop a baseline of public safety communications users before the storm and then again after landfall, to identify which systems are operating and which are not, and which areas their signals reach, which assists in identifying and prioritizing recovery needs);
- conducted outreach to the Florida, Louisiana, Mississippi, and Alabama broadcaster associations to determine status of their emergency preparations;
- conducted outreach to FEMA Region VI to determine support required from the FCC in Louisiana; and
- conducted outreach to local Spanish language radio and television broadcasters in the New Orleans area; and monitored and coordinated with our Federal partners to ensure that the non-English speaking community continued to have access to vital local news and emergency information during and after Isaac through KGLA 1540 AM/105.7 FM, and Telemundo Channel 42. These efforts led to the refueling of the backup generators that serve these stations' transmitter and studio.

Notably, these types of coordination and action also reflect the dramatic improvement that has occurred in the last few years in preparation and coordination across the government to respond to national disasters. Much of the information supplied by the FCC came through systems that did not exist at the time of Hurricane Katrina.

OTHER FCC INITIATIVES

The FCC is continually assessing and evaluating what initiatives it should take to enhance the reliability and resiliency of our nation's critical communications facilities. In August of last year, for example, the Chairman announced a five-step action plan to further the development and deployment of Next Generation (NG) 9-1-1 services. The plan includes actions by the FCC, and a roadmap for FCC partnerships with state, local, and tribal 9-1-1 authorities, other Federal agencies, and the private sector.

Though NG9-1-1 deployment will take time to accomplish, NG 9-1-1 systems will improve the reliability of 9-1-1 service because Internet Protocol-based architecture provides more flexibility and resiliency than the legacy circuit-switched 9-1-1 system. In an NG 9-1-1 world, people will be able to make voice, text, or video emergency "calls" from any communications device via Internet Protocol-based networks.

When NG 9-1-1 ultimately becomes widely available, consumers will benefit by having more ways to send information and more types of information that they can transmit. For example, someone who is able to text but not to speak aloud because of the danger they face, or someone who is hearing impaired, will be able to seek and obtain help more easily than now. In appropriate cases, the availability of more types of information-- pictures, videos, etc.-- may enable first responders to assess emergencies faster and more accurately, and launch a more effective response.

There is much work to do to advance to a full NG 9-1-1 environment. It will not be easy or fast. Consumers will need to be educated about the transition, and must understand that even as NG9-1-1 introduces new capabilities, voice 9-1-1 calling will continue to have many important advantages and will remain fully supported. We need to make sure that as NG 9-1-1 is deployed, we address the many important and valid concerns that PSAPs have about introducing new technology – so that new technology serves our 911 professionals rather than the other way around.

One crucial point: Even though the FCC and others are engaged in the hard and important work of helping to make an NG 9-1-1 world a reality in the not-too-distant future, we stress that it is essential to public safety that the FCC, telecommunications carriers, and the public safety community – take steps to improve the e 9-1-1 world as it is today. The public demands this, and rightfully so. As FCC Commissioner McDowell noted, having “[h]ardened and reliable 9-1-1 systems is crucial to the public interest.” The Chairman and other Commissioners, and public safety, demand that we improve the reliability of 9-1-1 in the world as it is today.

The FCC is also looking at what we can do better, including what actions, if any, we can take to improve the process of obtaining information through NORS and DIRS, how we use the information internally, and whether we can communicate better in emergencies with the public and with our partners, Federal and otherwise. As part of those improvement efforts, I note that this past February, the FCC, working with its public safety partners and telecommunication carriers, adopted rules requiring interconnected VoIP service providers to report significant network outages that meet

specific criteria and thresholds. The action was a common-sense recognition that interconnected VoIP services have become increasingly popular in recent years. The number of consumers using these services in lieu of traditional telephone service is growing steadily, with more than 87 million residential telephone subscriptions now provided as interconnected VoIP service. This means VoIP platforms are carrying a substantial volume of 9-1-1 calls.

At the end of the day, the bottom line is: All Americans should expect 9-1-1 service to be available not only in “normal,” everyday circumstances where a range of emergencies take place, but especially when it is perhaps most needed most of all – when a major disaster occurs. Our communications networks need to be just as reliable and resilient when there is an enhanced need for emergency assistance, as when there is not. We should never forget that lives depend on it.

Thank you for inviting me to appear before you today. I would be happy to answer any questions you may have.