

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
Resilient Networks)	PS Docket No. 21-346
)	
Amendments to Part 4 of the Commission's)	
Rules Concerning Disruptions to)	PS Docket No. 15-80
Communications)	
)	
New Part 4 of the Commission's Rules)	ET Docket No. 04-35
Concerning Disruptions to Communications)	

COMMENTS OF PUBLIC KNOWLEDGE

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EXECUTIVE SUMMARY

The transition from legacy circuit-switched systems to modern internet-protocol networks has revolutionized the performance and variety of services available to consumers. But these changes have come at a cost. Deployed with little or no regulatory oversight, IP-enabled networks suffer from an array of resiliency and security challenges not found in legacy systems. Unlike the copper landline system, for example, packet-switched networks do not draw power separately from the primary electric grid; therefore, when disruptions disable the electric grid, consumers, businesses, and governments all too often lose access to the communications technologies on which their families, businesses, and communities depend. The 2016 Wireless Network Resiliency Cooperative Framework has done very little to address this challenge. Rather than increasing reliability, the non-binding Framework has encouraged complacency in the face of the growing number of threats to the operability of our nation's communications systems.

America needs a modern resiliency plan that requires all carriers to act before, during, and after a disaster. The new comprehensive plan must ensure network resiliency in the face of power outages, promote roaming to avoid single points of failure, and improve, or in many cases, establish coordination and response plans in partnership with local communities.

A plan cannot improve what it does not measure. The Commission needs better, timelier, and more detailed outage and service-quality reporting to ensure accountability. The Commission then needs to make this data available to the public in a way that balances the twin imperatives of transparency and information security. As a complement to robust enforcement of its comprehensive plan, the Commission can offer incentives, such as regulatory fee credits, to encourage participation.

Network resiliency will not happen on its own. Because disasters are inconsistent, the benefits of a resilient network are hard to quantify, and creating resilient networks is not without costs. At the same time, carriers face significant financial incentives to minimize their network investments for these purposes. Without targeted regulatory oversight, carriers are unlikely to make the necessary network upgrades to keep Americans connected in times of crisis.

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COMMENTS OF PUBLIC KNOWLEDGE

I. INTRODUCTION

The efficiency and cost-savings of Internet protocol (IP) equipment has prompted communications network operators to retire legacy systems at a rapid clip. Years into the transition process, IP-based fixed and mobile networks have largely displaced switched network systems for a majority of the American public.¹ Indeed, the national policy of the United States has moved from initiating the IP transition to retiring the last legacy public switch telephone network equipment in favor of IP-based network technologies.² But these advances come at a cost: a diverse array of providers with little or no commercial incentive to serve one another’s customers during an outage operate these packet-switched technologies. These operators are

¹ *Communications Marketplace Report*, Report, 36 FCC Rcd 2945 ¶ 147 (2020) (“As of December 2019, residential fixed voice connections were about 30% switched access and 70% interconnected VoIP, with residential switched access connections comprising only 14.4% of all fixed retail voice connections.”).

² Building Resilient Networks, Before the Subcomm. On Communications, Media, and Broadband, 117 Cong. (2021), <https://bit.ly/3IgNWoe> (Statement of Harold Feld, Senior Vice President, Public Knowledge) (“Feld Testimony”).

under considerable pressure to forgo resiliency measures, such as backup power, that they assert consumers may never need.³ In other words, the very success of transitioning to a decentralized, low-cost, and competitive IP infrastructure means that hundreds of millions of Americans no longer have access to communication services that can operate when their provider experiences an outage or the power grid goes dark. All too often, when a consumer’s provider loses service or access to power today, communications—and their life-saving messages—cease.

The advent of more capable but less robust network infrastructure leaves the population vulnerable to disruption as technology, and communications grow in importance in our daily lives. For example, consumers now rely on mobile phones for 911 calling more than ever.⁴ As the Commission noted, consumers make 240 million calls to 911 each year, and 80% or more of these calls are from wireless phones in many areas.⁵ In 2019 alone, nearly 152 million 911 calls were made from wireless phones, accounting for approximately 72%-80% of all reported 911 calls.⁶ The mobile devices that Americans use to make these 911 calls rely on batteries that only

³ Comments of Verizon, PS Docket No. 14-174 et al., at 17-18 (filed Feb. 5, 2015) (noting that customers often choose not to obtain a battery either due to reliance on wireless/mobile devices); Reply Comments of AT&T Services, Inc., PS Docket No. 14-174 et al., at 8 (filed Mar. 9, 2015) (“For most Americans, a fully charged mobile device is all the battery backup they will ever want or need, and market evidence strongly indicates that consumers can be expected to have wireless phones available when power goes out[.]”).

⁴ Comments of the National Cable & Telecommunications Association, PS Docket No. 14-174 et al., at 6-7 (filed Feb. 5, 2015).

⁵ *Wireless E911 Location Accuracy Requirements*, Fifth Report and Order and Fifth Further Notice of Proposed Rulemaking, 34 FCC Rcd 11592 ¶ 1 (2019) (citing Nat’l Emer. Number Assoc., *9-1-1 Statistics*, <https://bit.ly/3DuEY3n>).

⁶ See *Twelfth Annual Report to Congress, On State Collection and Distribution of 911 and Enhanced 911 Fees and Charges for the Period January 1, 2019 to December 31, 2019*, FCC, ¶ 11 (Dec. 8, 2020). The FCC’s 911 call data is based on information collected from questionnaires the Public Safety and Homeland Security Bureau sent to the Governor of each state and territory and the Mayor of Washington, DC. Respondents reported 151,971,715 wireless calls to 911 in 2019, though the Bureau concluded that “this likely understates the

offer a few hours of talk time, even when completely charged. These batteries drain even faster when connected to a data network or while constantly searching for a connection because local towers are down. Moreover, even if a mobile device has power, an individual is only able to make a 911 call if the base stations and cell towers, which also rely on external power sources, have power too. As a result, when these infrastructure elements lose power, a completely charged cell phone is rendered useless in an emergency. And yet, these base stations, cell towers, and other vital infrastructure have no requirements to maintain backup power or other resiliency safeguards beyond what a limited few wireless carriers have volunteered on a non-obligatory basis.

Instead of proving more resilient, our networks have grown increasingly fragile, and outages have grown even longer in duration.⁷ Today, networks are more complex, relying on inputs such as external power that are often unable to assess what measures will maintain resiliency.⁸ Furthermore, carriers cannot force electric utilities to cooperate and prioritize communications services and have struggled to effectively prevent third parties from cutting fiber lines in the aftermath of an emergency. As a result, outages now happen more frequently and at a greater scale. Fundamental changes to network resiliency and restoration are therefore long overdue.

percentage of wireless 911 calls” because several states did not break out 911 calls into separate service categories. CTIA estimates that 80% of 911 calls are made from wireless devices. *See The Wireless Industry: Industry Data*, CTIA, <https://bit.ly/3Do4fMI> (last visited Dec. 5, 2021).

⁷ Feld Testimony at 1-2; U.S. Gov’t Accountability Off., *Telecommunications: FCC Should Improve Monitoring of Industry Efforts to Strengthen Wireless Network Resiliency*, GAO-18-198, at 14-15 (Dec. 2017), <https://bit.ly/3rvqPXS>.

⁸ Feld Testimony at 10.

Recent experience demonstrates that voluntary and vague commitments by a handful of wireless providers do not sufficiently serve consumers during emergencies. Instead of the widespread coordination and service continuity that the wireless industry has promised, the FCC's post-outage reports establish a bleak cycle: carriers fail to plan for resiliency, a disaster occurs, a large number of cell sites go dark, and stakeholders cannot communicate with one another. This results in widespread miscommunication, ineffective disaster responses, and ultimately, worse outcomes for victims of these ever-increasing national crises.

Keeping Americans connected, especially during emergencies, requires concrete and measurable actions before, during, and after an emergency, including mandatory roaming arrangements, mutual coordination, power backup, and thorough data collection. These commonsense measures, most of which the FCC has already proposed in its various post-outage reports, should apply to all service providers. The Commission can incentivize participation in these resiliency efforts through regulatory fee credits and establish new programs and measures to support disaster relief efforts.

II. BECAUSE THE INDUSTRY-INVENTED VOLUNTARY FRAMEWORK IS INSUFFICIENT, THE COMMISSION MUST UPDATE THE FRAMEWORK AND MAKE IT MANDATORY FOR ALL SERVICE PROVIDERS.

In 2016, in an attempt to assuage legislators' and customers' concerns over network resiliency, some members of the wireless industry announced a non-binding four-page Wireless Network Resiliency Cooperative Framework (Framework). They claimed this Framework would "enhance coordination and communication to advance wireless service continuity and information sharing during and after emergencies and disasters."⁹ The Framework envisioned

⁹ Letter from Joan March, AT&T et al., to Marlene Dortch, Secretary, FCC, PS Docket Nos. 13-239 & 11-60, at 1 (Apr. 27, 2016), <https://bit.ly/3og3DUT> ("Framework").

collaboration amongst providers that would “facilitate greater network resiliency and faster restoration of service,” thereby “obviate[ing] the need for legislative action or inflexible rules[.]”¹⁰ The following year, the wireless industry introduced a set of broad voluntary “Best Practices” meant to enhance emergency and disaster preparedness and restoration.¹¹ Five years later, there is little evidence of greater network resiliency. On the contrary, consumers have experienced outages of growing duration and frequency and inconsistent service restoration. The time has come to reexamine the usefulness of the voluntary Framework and establish meaningful, objective criteria for maintaining the country’s vital communications infrastructure.

A. The current Framework has not brought about adequate roaming arrangements.

The Framework’s first objective is to provide for “reasonable roaming ... when technically feasible.”¹² Despite this, the Public Safety and Homeland Security Bureau (Bureau) found that “inadequate reciprocal roaming arrangements” were one of three key factors that caused an unacceptable lack of service in the aftermath of Hurricane Michael.¹³ The Bureau’s report blamed spotty roaming arrangements for leaving tens of thousands of consumers without

¹⁰ *Id.*

¹¹ *Wireless Network Resiliency Cooperative Framework: Best Practices for Enhancing Emergency and Disaster Preparedness and Restoration*, CTIA (Dec. 20, 2017), <https://bit.ly/3rBktjc> (“Best Practices”).

¹² Framework at 1.

¹³ *October 2018 Hurricane Michael’s Impact on Communications: Preparation, Effect, and Recovery*, Report and Recommendations, PS Docket No. 18-339 ¶ 6 (PSHSB 2019) (“Hurricane Michael Report”). “Specifically, at least *some* wireless providers did not take advantage of the types of disaster-related roaming agreements envisioned in the Framework, allowing their customers to remain in the dark rather than roam on a competitor’s network. At least tens of thousands wireless customers had to wait days, unnecessarily, for their mobile phone service to be restored while their provider held off entering into roaming arrangements.” *Id.* ¶ 50.

service for days:¹⁴ “Specifically, it appears that some wireless providers demurred from seeking assistance from potential roaming partners and, therefore, remained inoperable.”¹⁵ The Bureau noted that some wireless providers simply ignored the Framework and failed to “obtain and implement supplemental roaming agreements”¹⁶ before the storm. This failure resulted in the carriers’ customers “being without cell service for several days while neighboring customers on a different network received service.”¹⁷

B. A resiliency plan that covers all Americans requires participation by all service providers.

These roaming failures reflect a broader flaw of a voluntary framework; without any imperative to participate, the Framework does not include all service providers, particularly those in more vulnerable areas with less infrastructure. These gaps leave consumers exposed to outages during emergencies. Even those service providers that do participate often offer spotty, inferior, or no roaming during emergencies. Taken together, these shortcomings harm consumers in ways that the Commission must swiftly remedy.¹⁸ The limited participant pool should make observers question how these signatories can possibly “foster mutual aid” (the Framework’s second prong)¹⁹ without the support of local providers.

Of course, even if the voluntary Framework could muster the wireless industry’s 100% participation, the Framework does not integrate non-mobile wireless providers, such as facilities-

¹⁴ *Id.* ¶ 50.

¹⁵ *Id.* ¶ 6.

¹⁶ *Id.* ¶ 23.

¹⁷ *Id.*

¹⁸ *Resilient Networks, et al.*, Notice of Proposed Rulemaking, FCC 21-99, PS Docket No. 21-346 ¶ 14 (“2021 NPRM”).

¹⁹ Framework at 2.

based backhaul providers, covered 911 service providers, cable, wireline, broadcast, DBS, iVoIP, and others.²⁰ These other service providers support vital elements of the communications network infrastructure. Without their participation, full network resiliency is not possible.

C. The current Framework has unnecessarily strict activation requirements.

In the unlikely scenario that all wireless and other communications providers participate in the Framework, the Framework still has stringent activation requirements that, by its own terms, prevent consumers from benefitting from the arrangement even in the face of an obvious disaster situation.²¹ There are two prerequisites to activating the Framework: FEMA’s National Response Coordination Center must declare Emergency Support Function 2 (ESF-2), and the FCC must activate the Disaster Information Reporting System (DIRS).²² If only one of these happens, the Framework’s proposed roaming arrangements, mutual aid commitments, and DIRS data disclosures do not go into effect, even in severe circumstances. For example, the Framework was not operational during the California power shutoffs and wildfires because FEMA did not activate ESF-2.²³ Despite proposing vague pre-planning and coordination protocols in its Best Practices—most of which are pushed off to local governments anyway—the Framework’s actionable steps are still primarily geared toward reaction and not preemptive action. Service providers should not wait for a federal agency to announce an impending weather disaster before coordinating and taking necessary steps to ensure service continues.

D. Each disaster event puts the Framework’s shortcomings on full display.

²⁰ 2021 NPRM ¶ 16.

²¹ *Id.* ¶ 15.

²² Framework at 3; *Public Safety and Homeland Security Bureau Seeks Comment on Improving the Wireless Resiliency Cooperative Framework*, Public Notice, 34 FC Rcd 2047, 2048 (PSHSB 2019).

²³ *See* 2021 NPRM ¶ 15.

A patchwork system of collaboration, after-the-fact communication, and roaming agreements offers only a band-aid solution for the nation’s frail communications infrastructure that “remains susceptible to disruption during disasters.”²⁴ Americans need more than just another rulemaking about what to do *after* a storm. The U.S. needs to establish an in-the-moment performance plan that public safety officials and consumers can expect from the networks they need to communicate leading up to and during an emergency.

Recent significant weather events and the inevitable power outages that follow have demonstrated that the country’s communications infrastructure requires fundamental changes. As Chairwoman Rosenworcel recently noted, a weather event like this year’s Winter Storm Uri and its resulting widespread communications outage “is a reminder that so much of our critical infrastructure is fragile.”²⁵ While the proposals presented in this rulemaking are necessary steps toward improving network resiliency, “the nation’s communications infrastructure remains highly prone to failure due to disruptions to commercial power in the face of disasters,”²⁶ and without corrective action, “the frequency of outages will worsen in coming years.”²⁷ Recent weather disasters illustrate the scope of the challenge:

- **Winter Storm Uri (2021):** Widespread communications outages spanned Texas and Oklahoma. At one point, 400,000 wireless users lost service, and another 720,000 VoIP users were also impacted.²⁸
- **Hurricane Ida (2021):** Within a day after the storm made landfall in Louisiana, 52% of cell sites across all 31 parishes were already out of the Commission, the majority due to

²⁴ *Id.* ¶ 2.

²⁵ *Amendments to Part 4 of the Commission’s Rules Concerning Disruptions to Communications*, Second Report and Order, 36 FCC Rcd 6136, 6221 (2021) (Statement of Acting Chairwoman Jessica Rosenworcel) (“2021 2nd R&O”).

²⁶ 2021 NPRM ¶ 35.

²⁷ *Id.*

²⁸ 2021 2nd R&O at 6221.

power outages.²⁹ Some parishes lost 100% of their cell sites.³⁰ Numerous 911 systems failed,³¹ including Orleans Parish, which was without 911 service for approximately 12 hours after the storm.³² T-Mobile lost over 30% of its wireless network, AT&T almost 40%.³³ Months later, officials still don't know why phone service went out.³⁴

- **Midwest Derecho (2020):** High winds across the Midwestern United States immediately led to outages of 1,770 served cell sites (12.4%) in Iowa alone.³⁵
- **California Wildfires (2019):** On some occasions during these wildfires, Marin County lost service from 57% of its 280 cellphone tower sites.³⁶ Sonoma, Lake, Santa Cruz, Humboldt, and Calaveras counties all encountered days in which more than 20% of cellphone towers were out.³⁷ At one point, 19% of cell towers in Napa County were not working.³⁸ As a result, many Californians were left relying on broadcast radio for word about family members.³⁹
- **Hurricane Michael (2018):** Ten days after landfall, Bay and Gulf Counties still showed up to 45% cell sites down.⁴⁰ “[M]any customers in Bay and Gulf Counties [were] without wireless service for over a week following landfall when service was needed most.”⁴¹

²⁹ *Communications Status Report for Areas Impacted by Hurricane Ida*, Report, at 4-5 (PSHSB 2021), <https://bit.ly/3Eivycx>.

³⁰ *Id.*

³¹ Todd C. Frankel et al., *911 Calls After Ida Went Unanswered in New Orleans Due to ‘Antiquated’ Technology*, WASH. POST (Aug. 30, 2021), <https://wapo.st/3xPNFnO>.

³² Adam Bender, et al., *Hurricane Ida Takes Down New Orleans 911*, COMMC’NS DAILY (Aug. 31, 2021), <https://bit.ly/3rrvvYd>.

³³ Karl Bode, *How Big Telecom Killed Rules That Would Have Prevented Hurricane Ida Outages*, VICE (Aug. 31, 2021), <https://bit.ly/3ExNFeJ>.

³⁴ JC Canicosa, *La. Lawmakers Still Don’t Know Why Phone Service Went Out During Hurricane Ida*, LA. WEEKLY (Oct. 25, 2021), <https://bit.ly/3DiUor6>.

³⁵ *Communications Status Report for Areas in Iowa Impacted by the Midwest Derecho*, Public Notice, at 3 (PSHSB 2020), <https://bit.ly/3lv6szI>.

³⁶ *Communications Status Report for Areas Impacted by California Public Safety Power Shutoffs*, Report, at 3 (PSHSB 2019), <https://bit.ly/3DhmbbF>.

³⁷ *Id.*

³⁸ *Id.*

³⁹ Leila Miller, et al., *California Suffered Widespread Cellphone Outages During Fires. A Big Earthquake Would be Much Worse*, LA TIMES (Nov. 5, 2019), <https://lat.ms/3lxcrnx>.

⁴⁰ Hurricane Michael Report ¶ 29.

⁴¹ *Id.* ¶ 24.

The FCC cited power outages as the primary cause of cell site outages on the first day of the storm.⁴²

The fragility of our infrastructure is not only on display during news-making weather events but also manifests during routine local mishaps. In October, for example, Erie, Pennsylvania lost cell service due to a fire in a utility maintenance hole. Local first responders lost service for several days and had to resort to warning local citizens to use the pull box outside the local firehouse in the case of an emergency.⁴³

The next-generation infrastructure must offer more reliable service in the face of disruption—something that the industry-made Framework and Best Practices have not accomplished after several years and countless millions of Americans losing service during disasters. Service providers’ responses to weather emergencies and other disasters have shown that light-touch, voluntary principles leave consumers in the lurch.

Despite these notable failings, the wireless industry has claimed success. During the FCC’s October 2021 Open Meeting, CTIA boasted that it was proud of how the Framework played out during Hurricane Ida: “The statistics and the experience of Hurricane Ida show that the flexible approach that we have is working very, very effectively.”⁴⁴ This closely resembles CTIA’s assessment of the wireless industry’s disastrous response to Hurricane Michael, in which it concluded that “the effectiveness of the Wireless Resiliency Framework during Hurricane Michael can also be attributed to its inherent flexibility.”⁴⁵ Verizon said that during Hurricane

⁴² *Id.* ¶ 27.

⁴³ Haley Potter, *Local Paramedics Impacted by AT&T Outages*, Erie News Now (Oct. 6, 2021), <https://bit.ly/32Vn7Gc>.

⁴⁴ Disaster Communications Field Hearing, October 2021 Open Meeting, FCC (Oct. 26, 2021) (Testimony of Scott Bergman, Senior Vice President, Regulatory Affairs, CTIA—The Wireless Association).

⁴⁵ Comments of CTIA, PS Docket No. 18-339, at 16 (filed Dec. 17, 2018).

Michael, its “adherence to the Framework worked as intended, and our use of roaming arrangements, mutual aid, support of and participation with the affected municipal and state governments, and consumer and stakeholder outreach, ultimately contributed to our service restoration efforts and helped to mitigate the impact on consumers and first responders.”⁴⁶ And, Sprint asserted that the Framework “was effective in preparation for and during Hurricane Michael as wireless carriers worked to make wireless networks available to consumers and public safety.”⁴⁷

This praise was unconvincing. As the Hurricane Michael Report aptly summarized, the “effusive praise given by Framework signatories ... simply does not ring true, in light of the lengthy wireless outages in Bay and Gulf Counties.”⁴⁸ This finding prompted then-Commissioner Rosenworcel to call on the Commission to “fundamentally refresh its playbook for disaster preparedness and resiliency”⁴⁹ and enhance reliability before the next disaster strikes. So far, this call has gone unanswered.

III. A MODERN RESILIENCY PLAN REQUIRES CARRIERS TO TAKE CLEAR AND OBJECTIVE MEASURES BEFORE, DURING, AND AFTER A DISASTER.

All communications providers should constantly conduct joint planning and mutual assistance to keep networks up during crises and to restore operations as quickly as possible. As Public Knowledge recommended in a recent meeting with Commissioner Starks’ office, “Ideally, every geographic market or relevant subdivision would have a ‘war room’ where network

⁴⁶ Comments of Verizon, PS Docket No. 18-339, at 16 (filed Dec. 17, 2018).

⁴⁷ Comments of Sprint Corporation, PS Docket No. 18-339, at 6 (filed Dec. 17, 2018).

⁴⁸ Hurricane Michael Report ¶ 50.

⁴⁹ 2021 2nd R&O at 6221.

operators could gather with public safety representatives to coordinate and maximize network resilience immediately before, during, and after the emergency.”⁵⁰

The record shows that pre-planning and coordinating emergency responses are vital. Despite the Framework’s conclusion that “[c]oordination and preparation by wireless providers, consumers and stakeholder agencies, are critical to robust resiliency and the ability to maintain communications,” the Commission regularly cites carriers’ failure to coordinate as a primary reason why communications outages last as long as they do during major storms. In the aftermath of Hurricane Michael, the Public Safety Bureau found that “[t]he poor level of service several days after landfall by some wireless providers cannot simply be attributed to unforeseeable circumstances specific to those providers. A lack of coordination and cooperation between certain wireless service providers on the one hand, and utilities and debris clearance crews on the other, unnecessarily prolonged critical backhaul repairs and full restoration of functioning wireless service.”⁵¹

In order to bring together all relevant stakeholders and data, Public Knowledge asks the Commission to encourage state public utility commissions, electric utility companies, and related infrastructure service providers to contribute their expertise and insight to this proceeding.

A. The Commission has already developed commonsense protocols.

The FCC must require all wireless and backhaul providers to perform basic measures that reflect the lessons it has gleaned from recent post-disaster reports. In these reports, the FCC has

⁵⁰ Letter from Harold Feld, Senior Vice President, Public Knowledge, to Marlene Dortch, Secretary, FCC, PS Docket No. 21-346 et al., at 2 (filed Oct. 14, 2021) (“October 2021 Ex Parte”).

⁵¹ Hurricane Michael Report ¶ 5.

outlined straightforward and obvious procedures that, if performed, would undoubtedly improve disaster responses.⁵² These include:

- Designating an individual point of contact;
- Maintaining reciprocal roaming agreements that are in effect prior to a storm's landfall or service outage;
- Maintaining coordination and response plans with local power companies and emergency response agencies, including training activities with state Emergency Operations Centers and working groups of the National Association of Regulatory Utility Commissioners to improve coordination of restoration activities;
- Maintaining coordination and response plans with local, state, or federal emergency management and law enforcement agencies for pre-credentialing to help facilitate access by technicians to restricted areas during an event;
- Maintaining backup power to critical infrastructure and at customer sites;
- If applicable, diversifying backhaul options, such as through the use of microwave links and satellite links;
- Submitting status updates and situational awareness information to DIRS and NORS during an outage; and
- Preparing a publicly-available post-outage report detailing the provider's adherence to these requirements.

Providers should also file annual reports with the Public Safety and Homeland Security Bureau detailing their disaster response and resiliency practices. Objective criteria that the FCC can measure, track and enforce would represent a vast improvement to the status quo. Requiring carriers to adhere to these straightforward and actionable measures—nearly all of which the FCC has already called for in recent post-outage reports—would promote accountability and leave the country better prepared for the next disaster.

⁵² See *id.* at 22-24; *2017 Atlantic Hurricane Season Impact on Communications Report and Recommendations*, Report, PS Docket No. 17-344, at 28-33 (PSHSB 2018), <https://bit.ly/3xRykCX>.

B. Mandatory rules must address backhaul outages that do not necessarily result from physical disasters.

Mandatory planning and coordination measures must address backhaul routing and rerouting outages rather than just outages caused by physical disasters. According to Verizon, “the vast majority of wireless outages result from the loss of backhaul facilities[.]”⁵³ To consumers, outages due to limited backhaul capabilities⁵⁴ are practically indistinguishable from those caused by a physical disaster, except to the extent that it leaves consumers *even less* prepared than a weather event that is predicted a week out would.

The FCC’s record is full cell outage reports due to backhaul issues rather than physical destruction or power outages. After Hurricane Michael, the Public Safety Bureau blamed “insufficiently resilient backhaul connectivity” as one of the predominant causes of the “unacceptable lack of service.”⁵⁵ According to the Hurricane Michael Report, “[t]he leading cause of wireless service outages in the days after landfall was damage to the extensive aerial and underground cabling networks used to provide backhaul service to wireless cell sites.”⁵⁶ Further, “cell sites out of service due to power outages were restored much more quickly than those out of service due to backhaul outages.”⁵⁷ Other notable examples of backhaul failures include the 2018 CenturyLink outage⁵⁸ and, before that, the 2015 AT&T outage.⁵⁹ To avoid

⁵³ Comments of Verizon, PS Docket No. 11-60, at 5 (filed Apr. 26, 2021).

⁵⁴ 2021 NPRM ¶ 24.

⁵⁵ Hurricane Michael Report ¶ 6.

⁵⁶ *Id.* ¶ 27.

⁵⁷ *Id.* ¶ 30

⁵⁸ Joan Engebretson, *FCC’s CenturyLink 911 Outage Report Reveals Tech Transition Risk*, TELECOMPETITOR (Aug. 19, 2019), <https://bit.ly/3G10ut2>; *CenturyLink, Inc.*, Order, 34 FCC Rcd 10257 (EB 2019); *West Safety Communications, Inc.*, Order, 34 FCC Rcd 10267 (EB 2019).

⁵⁹ *See, e.g.*, Jon Brodtkin, *An AT&T Problem Allegedly Caused Outage on Verizon, Sprint, and T-Mobile*, ARSTECHNICA (Aug. 5, 2015), <https://bit.ly/3y01Eay>.

these types of outages, backhaul providers must diversify their network infrastructure to include wireless services that are not so fragile and susceptible to natural disasters or human error. Such alternatives could include microwave links and satellite links. In any event, an effective action plan must activate during *any* outages, not just those caused by natural disasters or non-weather-related outages.

C. Make emergency voice, SMS, and data roaming mandatory for all carriers on a bill-and-keep basis.

Planning ahead can prevent breakdowns in roaming and network sharing mechanisms. Roaming allows wireless customers to switch to another provider's wireless network automatically. This service handoff is vital during emergencies. After Hurricane Michael, the Public Safety Bureau concluded that service would have drastically improved had providers entered into roaming agreements before the storm.⁶⁰ Even though the Framework's leading method of enhancing coordination is to provide for "reasonable roaming under disasters arrangements when technically feasible,"⁶¹ this too has come up short. In the Hurricane Michael Report, the Bureau concluded that "at least some wireless providers did not take advantage of the types of disaster-related roaming agreements envisioned in the Framework, allowing their customers to remain in the dark rather than roam on a competitor's network."⁶² This failure forced tens of thousands of wireless customers to "wait days, unnecessarily, for their mobile phone service to be restored while their provider held off entering into roaming arrangements."⁶³ Most recently, after Hurricane Ida, the FCC faulted "limited transparency, and therefore

⁶⁰ Hurricane Michael Report ¶ 23.

⁶¹ Framework at 1.

⁶² *Id.* ¶ 50.

⁶³ *Id.*

understanding, regarding the status of roaming, including where it was available and where it was not, and which network technologies were utilized.”⁶⁴

As the Commission noted, the availability of voice and data roaming arrangements is “critical to promoting seamless consumer access to mobile services.”⁶⁵ No time is more critical than during an emergency. Requiring more meaningful roaming arrangements to support communications would not only reconnect consumers with emergency services, family, neighbors, and friends more quickly but also help improve coordination among law enforcement, utility workers, and other emergency responders. And with public safety now depending on text and data as much as voice, these more robust roaming requirements must include SMS and data as well as voice communications.

At a minimum, the Commission should require mandatory emergency roaming agreements for the entire industry on a “bill-and-keep” basis. Moving to bill-and-keep will reduce administrative costs and enable smaller carriers to activate roaming agreements swiftly and maintain them for the duration of the emergency. In addition, the Commission must ensure that roaming arrangements are made under commercially reasonable terms and conditions.⁶⁶ Adopting such a requirement would promote consumer access to seamless mobile coverage in emergency situations, particularly in less-served and more vulnerable rural areas.⁶⁷ This

⁶⁴ 2021 NPRM ¶ 18.

⁶⁵ *Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers and Other Providers of Mobile Data Services*, Declaratory Ruling, 29 FCC Rcd 15483 ¶ 2 (2014) (citing *Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers and Other Providers of Mobile Data Services*, Second Report and Order, 26 FCC Rcd 5411 ¶ 1 (2011)).

⁶⁶ See 47 C.F.R. § 20.12(e).

⁶⁷ See *Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers and Other Providers of Mobile Data Services*, Second Report and Order, 26 FCC Rcd 5411 ¶¶ 13-56 (2011).

flexibility also allows providers to negotiate on an individualized basis while restraining conduct that might inhibit the establishment of a widespread roaming environment.

While not without its limitations, the advent of a common set of 4G and 5G devices that incorporate large numbers of band classes, as well as the transition of all major carriers to LTE and 5G NR networks, represents a meaningful step forward from purpose-built handsets that relied on largely incompatible prior-generation 3G and earlier technologies that could not readily interoperate. The expanding device and software ecosystem around a common set of 4G and 5G technologies makes mandatory roaming agreements less burdensome and more practical than ever, especially as the benefit to consumers of keeping connected during an emergency becomes ever more pronounced.

D. A modern resiliency plan requires participation from all communications providers, including broadcasters, public safety, and utility services.

The United States must expand its resiliency framework to include the entire communications ecosystem; otherwise, it will never have reliable wireless communications in an emergency. According to the Commission, “findings from our prior inquiries suggest there may be targeted opportunities to improve the voluntary Framework and network resiliency—not just of wireless networks, but of communications networks as a whole.”⁶⁸ Other services, such as DBS, broadcast, and VoIP providers⁶⁹ could prove vital when power is down on cell towers and microcells.

Looking at the entire communications infrastructure in the context of public safety is not new. The Department of Homeland Security’s Cybersecurity & Infrastructure Security Agency refers to broadcast, cable, satellite, wireless, and wireline as a “core network” that makes up an

⁶⁸ 2021 NPRM ¶ 14.

⁶⁹ *Id.* ¶ 16.

“integral component of the U.S. economy, underlying the operations of all businesses, public safety organizations, and government.”⁷⁰ Looking ahead, ATSC 3.0 service may also provide backup communications.

As a first step, the Commission should undertake a mapping exercise on a geographic-area basis of the communications environment. The Commission and emergency planners should know at a glance which broadcasters, broadband providers, voice providers, backhaul providers, PSAP providers, and other communications providers are in a geographic region and how they inter-relate with each other (or do not). Such maps could facilitate planning before an extreme weather event or disaster, coordinating during the emergency, and investigating accountability afterward.

E. Resiliency responses must go into effect sooner.

Unlike the existing Framework, providers should not wait for FEMA and the FCC before initiating resiliency measures. Consumers benefit when providers prepare and coordinate before disasters strikes. In the aftermath of Hurricane Michael, the Public Safety Bureau noted that pre-storm preparation “allowed for a rapid restoration of power to cell sites.”⁷¹ Very few natural disasters appear without warning. Just as consumers are expected to prepare for the worst, a declaration of emergency should, at the very least, trigger service providers to deliberate and coordinate amongst themselves. Therefore, a declaration of emergency should automatically initiate mutual aid and bring the various parties together in the “war room” to coordinate their response efforts.⁷²

⁷⁰ Introduction to the Communications Sector Risk Management Agency, DHS Cybersecurity & Infrastructure Security Agency, <https://bit.ly/3EpUWwV> (last visited Dec. 6, 2021).

⁷¹ Hurricane Michael Report ¶ 24.

⁷² October 2021 Ex Parte at 2.

IV. CONSUMERS MUST HAVE BACKUP POWER DURING OUTAGES.

In the past, consumer advocates called for power backup for fixed services, but the record is clear that consumers now heavily rely on mobile wireless services as well. Nearly 97% of Americans own a cell phone; 15% of American adults only access the Internet through their smartphone, not through a traditional broadband service.⁷³ Reliance on smartphones for online access is particularly common among younger adults and low-income Americans.⁷⁴ As a result, consumers now rely on mobile phones to call 911 more than ever.⁷⁵ “Consumers make 240 million calls to 911 each year, and in many areas, 80% or more of these calls are from wireless phones.”⁷⁶ A CTIA survey found that 93% of surveyed consumers believe wireless messaging is a trusted communications environment.⁷⁷

The expectation in the 2015 power backup proceeding was that the industry would move from low-power proprietary backup batteries provided at the point of sale to something more sustainable, widely accessible, and more reliable. As Commissioner Starks noted, “[C]ommunications services are only as good as their access to power. This is a recurring scenario. During the 2020 earthquakes in Puerto Rico, the overwhelming majority of cell-site outages resulted from power loss, not damage to facilities. The same was true this year after

⁷³ *Mobile Fact Sheet*, Pew Research Center (Apr. 7, 2021), <https://pewrsr.ch/3DunlAJ>.

⁷⁴ *Id.*

⁷⁵ Comments of National Cable & Telecommunications Association, PS Docket No. 14-174 et al., at 6-7 (filed Feb. 5, 2015).

⁷⁶ *Wireless E911 Location Accuracy Requirements*, Fifth Report and Order and Fifth Further Notice of Proposed Rulemaking, 34 FCC Rcd 11592 ¶ 1 (2019) (citing Nat’l Emer. Number Assoc., *9-1-1 Statistics*, <https://bit.ly/2ZYZXxp>). See also *The Wireless Industry: Industry Data*, CTIA, <https://bit.ly/3Do4fMI> (last visited Dec. 6, 2021).

⁷⁷ *The Wireless Industry: Industry Data*, CTIA, <https://bit.ly/3Do4fMI> (last visited Dec. 6, 2021).

Hurricane Ida.”⁷⁸ Public Knowledge agrees that the country is long overdue for mandatory battery backup.

A. Carriers are not incentivized to provide backup.

Without a mandate, carriers have no real reason to make power backup available, as consumers generally do not hold them accountable, even in the midst of a network outage. “[C]arriers will generally escape consumer backlash after a disaster-based outage because consumers blame the storm for the damage. Even when service is particularly bad by a specific carrier, outages are rare enough that consumer memory fades over time.”⁷⁹

Verizon noted in the 2015 resiliency proceeding, “[M]any customers today choose not to obtain a battery, given the growing reliance on wireless or the customers’ use of handsets or other devices that themselves require commercial power to operate.”⁸⁰ This sentiment misses the larger picture. Even if consumers did consider battery backup, they would face uncertainty over whether a new carrier will offer a significant enough improvement in reliability to justify the cost and aggravation of switching providers. Moreover, without access to outage and reliability data, carriers cannot expect consumers to make educated decisions about their wireless carrier or the need for backup.⁸¹

Consumers also may not consider access to backup power when picking a carrier because, after decades of experience, they expect their telephone to work even during a power

⁷⁸ 2021 NPRM at 46 (Statement of Commissioner Starks).

⁷⁹ Feld Testimony at 11.

⁸⁰ Comments of Verizon, PS Docket No. 14-174 et al., at 17-18 (filed Feb. 5, 2015).

⁸¹ Feld Testimony at 10-11. (“[C]arriers that invest in reliability cannot expect to be rewarded for their efforts in the market. Because the FCC keeps reliability data confidential, customers cannot make purchasing choices based on reliability.”)

outage.⁸² Regardless, the Commission has a responsibility to anticipate problems and require suitable mitigation measures. It is easy for consumers to dismiss the need for backup power when they have not yet experienced a crisis. If market mechanisms were sufficient to protect the public from the consequences of network failure, we would not need this proceeding. The argument from providers unwilling to address the need for consumer premise backup power that the public is “not interested” is irrelevant and self-serving. Public Knowledge, therefore, reiterates its recommendation to require all basic fixed telephone service, managed VoIP, 911, and E911 providers to provide battery backup across all types of technologies.⁸³

Carriers are also incentivized to cut costs in any way possible—especially where investment does not yield immediate short-term profit.⁸⁴ This presents a free-rider problem, which discourages providers from investing in resiliency measures that benefit rival networks without receiving any reciprocal advantage.⁸⁵

Federal and local governments require backup power to function. Without the previous generation’s powered copper lines or modern, resilient networks, municipal and federal functions that rely on broadband and mobile networks cease to function, including calls to and from PSAPs, first responder communications (as the California wildfires tragically made clear), traffic operations, WEA messages to the public, and school and library services.

B. Battery backup technology exists and is widely available.

⁸² Reply Comments of National Cable & Telecommunications Association, PS Docket No. 14-174 et al., at 2 (filed Mar. 9, 2015) (“Cable operators have not noticed any meaningful customer outcry or defections following power outages, nor have they witnessed significant spikes in demand for backup batteries after an outage.”).

⁸³ Comments of Public Knowledge, *et al.*, PS Docket No. 14-174 et al., at 21 (filed Feb. 5, 2015).

⁸⁴ Feld Testimony at 10.

⁸⁵ *Id.* at 11. *See also* October 2021 Ex Parte at 2.

Access to backup batteries has improved over the past several years. Battery power and storage have improved while the costs of solar technology have declined. Lithium-ion, solar, and other inexpensive power sources can power CPE without the need for generators.⁸⁶ Compared to the D-cell batteries touted by service providers in 2015, modern rechargeable lithium-ion batteries last longer, are much lighter, withstand temperature drops better, and are much more widely available than ever before.⁸⁷ Moreover, as electric vehicles become more common and battery storage costs fall, the country is seeing greater public and private investment in new electric storage technologies.⁸⁸

Solar cells are also an obvious option. The cost of solar photovoltaic (PV) cells per MWh has gone down each year, including in residential, commercial, and utility operations.⁸⁹ From 2019 to 2020 alone, PV electricity generation jumped 23.1%.⁹⁰ In 2020, PV electricity generated 2.3% of all electricity generated in the country.⁹¹ The declining price of solar panels and installation costs, as well as increased capacity, will continue to drive significant growth in the nation's adoption of solar technology.⁹²

⁸⁶ Diesel generators may still be the most suitable backup power option for larger cell sites.

⁸⁷ *Lithium Battery Costs Have Fallen By 98% in Three Decades*, The Economist (Mar. 31, 2021), <https://econ.st/3EuQeOl>; *As Battery Costs Plummet, Lithium-Ion Innovation Hits Limits, Experts Say*, S&P GLOBAL, (May 14, 2020), <https://bit.ly/3rGV1sz>.

⁸⁸ See, e.g., *DOE Announces \$209 Million for Electric Vehicles Battery Research*, Department of Energy (Oct. 27, 2021), <https://bit.ly/31Ci1y6>; Scott Patterson, *Battery Makers Tied to Power Grid Attract Big Investors*, WALL ST. J. (Sept 9, 2021), <https://on.wsj.com/3oC2vvb>.

⁸⁹ *Documenting a Decade of Cost Declines for PV Systems*, National Renewable Energy Laboratory (Feb. 10, 2021), <https://bit.ly/31wFQHK>.

⁹⁰ *Net Generation from Solar Photovoltaic*, U.S. Energy Information Administration, <https://bit.ly/3pPC1pp> (last visited Dec. 6, 2021).

⁹¹ *Electricity Explained: Electricity in the United States*, U.S. Energy Information Administration, <https://bit.ly/3DoRkdn> (last updated Mar. 18, 2021).

⁹² *Mordor Intelligence*, Report—Global Solar Energy Market (2021-2026), <https://bit.ly/3ot45PA> (last visited Dec. 6, 2021).

Regardless of the technology, a backup mandate is easily achievable and has already been set in motion in high-risk areas in California. As a result, many of the nation’s providers are already aware of the need for backup power and are preparing to adopt backup power measures in California.⁹³

C. Each stage of the communications infrastructure requires technology-neutral backup power.

As the Commission notes, “a lack of commercial power at key equipment and facilities is the single biggest reason why communications networks transmitting 911 service and related emergency information fail in the aftermath of disaster events.”⁹⁴ Without sufficient power to all aspects of a provider’s network, the public is disconnected from life-saving 911 services, and local governments are unable to reach citizens with emergency messages, evacuation orders, and other public safety-related communications.⁹⁵

Chairwoman Rosenworcel’s analysis of Hurricane Ida remains relevant: “Our review of the data collected in the aftermath of Hurricane Ida reveals that the lack of commercial power at key equipment and facilities is the single biggest reason why communications networks failed. Left unaddressed, this problem will only get worse in coming years as we experience disasters with increasing severity, duration, and impact.”⁹⁶

⁹³ Will Schmitt, *California Requires Landline Operators to Have 72 Hours of Backup Power for Disasters*, THE PRESS DEMOCRAT (Feb. 11, 2021), <https://bit.ly/3or0eTm>.

⁹⁴ 2021 NPRM ¶ 34.

⁹⁵ *Id.* ¶ 35.

⁹⁶ 2021 NPRM at 41 (Statement of Acting Chairwoman Rosenworcel).

At the same time, the shape of our infrastructure is changing. As a result, Public Knowledge agrees that the country must “rethink our policies regarding backup power.”⁹⁷ This includes recognizing the importance of 5G infrastructure.⁹⁸ While there is no perfect mechanism to calculate specific hour requirements for each element of such a sophisticated communications infrastructure, specific states have established baseline requirements that can serve as examples for a federal policy.

Category 1: Outside the Home Critical Infrastructure

Critical infrastructure elements should retain a minimum of seven days’ on-site backup power. Critical infrastructure in a wireline network includes the central office, wire center, switching center, headend, network nodes, remote terminals, and all assets necessary⁹⁹ for these operations to continue. Wireless critical infrastructure includes the mobile telephone switching office (MTSO) or its equivalent, switching centers, central offices, wire centers, head ends, network nodes, field cabinets, remote terminals, and macrocellular tower sites, or their functional equivalents.¹⁰⁰ For practical purposes, exceptions could include satellites, as well as certain rooftop, small cell, or outdoor and indoor distributed antenna system sites.¹⁰¹ Infrastructure locations on or around archaeological or historical sites, natural heritage areas, national parks,

⁹⁷ *Amendments to Part 4 of the Commission's Rules Concerning Disruptions to Communications, et al.*, Second Further Notice of Proposed Rulemaking, 35 FCC Rcd 2239, 2292 (2020) (Statement of Commissioner Rosenworcel) (“2020 2nd FNPRM”).

⁹⁸ *Id.*

⁹⁹ California PUC backup power requirements for wireline providers in high risk areas. *See* Decision Adopting Wireline Provider Resiliency Strategies, Cal. Pub. Utils. Comm’n, R.18-03-011, at 17 (2021), <https://bit.ly/31vAlZT>.

¹⁰⁰ *See* Decision Adopting Wireless Provider Resiliency Strategies, Cal. Pub. Utils. Comm’n, D 20-07-011, at 36 (2020), <https://bit.ly/303nDAW>.

¹⁰¹ *See* A.B. 2421, Cal. Legis. Serv. Ch. 255 (2020), <https://bit.ly/3IsD5Yw>.

and other culturally or environmentally sensitive areas may also not be able to stockpile industry-standard power sources.

Category 2: Individual Customer Equipment

At the same time, a powered infrastructure is meaningless unless customers can also power their home devices. Therefore, providers should, at the point of sale, offer a minimum of 72 hours of on-site backup power for all service provider-owned CPE at no cost to the customer. Providers should be required to renew this offer at least once a year and within a reasonable time after a major (72 hours or more) power outage.

To effectuate this, providers may find that supplying a single power source capable of serving all devices at a customer location is the most efficient method. This could mean that backup power may not need to connect to individual devices at all times. If the provider chooses to install backup power technology at the customer's residence, the customer should be responsible for making sure the power supply is charged and ready, but the provider should be responsible for an annual maintenance check-up to ensure everything is in good working order and that the power supply has not degraded.¹⁰²

Such a mandate is not a tall order. Even five years ago, D-cells were widely available and could be stockpiled indefinitely in proper conditions, thus providing consumers with hours of backup time. Prices for D-cells and more sustainable battery backup options have only decreased since then.¹⁰³

¹⁰² Comments of Public Knowledge, et al., PS Docket No. 14-174 et al., at 8-9 (filed Mar. 10, 2015).

¹⁰³ See *supra* Section IV.B.

V. THE COMMISSION SHOULD COLLECT DATA ON SERVICE QUALITY FROM ALL SERVICE PROVIDERS.

One of the most significant problems when discussing network reliability and resiliency is that there is no meaningful way to measure it other than “is the network operating today?” This is why Public Knowledge called on the Commission for years¹⁰⁴ to evaluate end-user technologies based on objective metrics, which are consistent with the FCC’s latest proposals for reform, including:

- Network capacity under stress;
- Call quality;
- Device interoperability;
- Service and support for users with disabilities;
- System availability;
- Service to 911 entities and Public Safety Answering Points (PSAPs);
- Cybersecurity;
- Call persistence;
- Call functionality; and
- Wireline coverage.

Reported data must also encompass disruptions to broadband service, including mobile and fixed wireless coverage. As Chairwoman Rosenworcel noted, “How is it possible that we are the expert agency with responsibility for our nation’s communications but do not have a mandatory requirement to report where broadband service was cut off and when?”¹⁰⁵

¹⁰⁴ See, e.g., Comments of Public Knowledge, et al., PS Docket No. 14-174, at 9 (filed Feb. 5, 2015).

¹⁰⁵ 2020 2nd FNPRM at 2292 (Statement of Commissioner Rosenworcel).

Further, the Commission should require carriers to participate in DIRS. In a disaster scenario, DIRS provides “a wealth of actionable information that can shape the local, state, and federal response.”¹⁰⁶ As long as carriers are not required to report, it is not always clear whether a carrier chooses not to disclose this valuable information or whether the carrier has sustained so much damage it is impossible to report the information—a vital distinction.¹⁰⁷ Making DIRS participation mandatory will make DIRS reports exponentially more valuable.

DIRS information should also be widely available. The industry’s laudable call for “consumer choice” is otherwise meaningless rhetoric because, without this information, the consumer base cannot make informed decisions.¹⁰⁸ Public Knowledge reiterates that if the Commission and the industry continue to rely purely on market incentives, they must recognize that markets need data. Consumers must be able to choose their providers based on real information. Providers may claim this information is proprietary, “but there is a huge difference between ‘proprietary’ and ‘embarrassing.’”¹⁰⁹ In fact, hiding this data does not protect trade secrets; outages are not a secret to the people impacted. Rather, concealing this data only makes it more difficult for consumers and regulators to hold providers accountable.¹¹⁰

Further, the Commission should combine NORS and DIRS into a single publicly available database and conduct a full report after every significant outage.¹¹¹ The Commission

¹⁰⁶ 2021 NPRM at 45 (Statement of Commissioner Starks).

¹⁰⁷ *Id.*

¹⁰⁸ Feld Testimony at 10 (“Because the FCC keeps reliability data confidential, customers cannot make purchasing choices based on reliability.”).

¹⁰⁹ Disaster Communications Field Hearing, October 2021 Open Meeting, FCC (Statement of Harold Feld, Senior Vice President, Public Knowledge) (Oct. 26, 2021), <https://bit.ly/3dqbDg0>.

¹¹⁰ *Id.*

¹¹¹ 2021 NPRM ¶ 25.

could use this combined information to prepare a post-mortem report and conduct field hearings after major emergencies. Such a report will help the Commission, industry, and consumers learn from past disasters and improve their responses for the future.¹¹²

This information could also aid the Commission in convening relevant stakeholders, particularly state, local and Tribal governments, to develop best practices. And, this data could assist the FCC in identifying the special needs of island communities, geographically limited areas, Tribal lands, low-income and traditionally marginalized communities of color, and communities in environmentally sensitive areas. These populations are more vulnerable than any other when disaster strikes.¹¹³

VI. FEE CREDITS WOULD INCENTIVIZE PARTICIPATION IN NETWORK RESILIENCY EFFORTS.

After years of minimal oversight, the Commission should incentivize carriers to take seriously their role in network resiliency by reducing regulatory fees for compliant carriers and creating a universal service program to build a more secure infrastructure.

Section 9A of the Communications Act authorizes the Commission to reduce regulatory fees if it is in the public interest.¹¹⁴ These reduced fees could come in the form of an “investment credit” by reducing regulatory fees on a dollar-for-dollar basis if a provider hardens its network and improvements are accessible to and shared with everyone else in a geographic area. A credit

¹¹² 2020 2nd FNPRM at 2292 (Statement of Commissioner Rosenworcel).

¹¹³ 2021 NPRM at 45 (Statement of Commissioner Starks) (“We also know that extreme weather, natural disasters, and power outages are particularly devastating for communities of color.”) (citing Press Release, EPA, EPA Report Shows Disproportionate Impacts of Climate Change on Socially Vulnerable Populations in the United States (Sept. 2, 2021), <https://bit.ly/3y1XZsP>; Leiserowitz & Akerlof, Yale Project on Climate Change, Race, Ethnicity and Public Responses to Climate Change (2010), <https://bit.ly/3rP0NIu>)).

¹¹⁴ See 47 U.S.C. § 159a(d).

that encourages investment in network resiliency as a whole, not just a siloed measure for the individual provider, will certainly qualify as a public interest justification for such a credit.¹¹⁵ This could also overcome the free-rider problem that discourages providers from investing in measures that “risk” benefitting competitors.¹¹⁶ Such an incentive could also encourage providers to engage in joint planning and mutual assistance in order to keep networks up during crises and to restore operations as quickly as possible.¹¹⁷

Importantly, these measures and resulting credits should add to, not replace, existing responsibilities.

VII. THE COMMISSION SHOULD ESTABLISH NEW MEASURES TO SUPPORT DISASTER RELIEF.

In addition to regulatory credits, the Commission should consider creating a universal service program specifically for disaster relief, just as it did when authorizing USF funds to assist Puerto Rican carriers after Hurricane Maria. The Commission can institutionalize this type of response by adding new principles relevant to network resiliency and creating a formal new fund specifically for resiliency upgrades.

The Commission also has many resources of its own, including administrative resources and available spectrum, at its disposal. For example, the Commission maintains two services that are subject to database control: the TVWS and the CBRS. These databases can authorize devices to use higher power for specific locations and services, such as point-to-point links to restore backhaul or last-mile connectivity. The Commission could also make the 4.9 GHz band available for emergency communications by non-public safety entities where needed. Additionally, the

¹¹⁵ See October 2021 Ex Parte.

¹¹⁶ See *id.*

¹¹⁷ See *id.*

Commission could safeguard public safety needs in a manner similar to FirstNet, which prioritizes communications by traditional public safety and first responder entities over those of other network users.

VIII. CONCLUSION.

Consumers and businesses depend more than ever on telecommunications networks and expect reliable service, particularly during emergencies. But the swift transition to a decentralized IP infrastructure with few standards for resiliency and little oversight from the Commission has made consumers more vulnerable to communications outages than at any time since the advent of the Bell System. Over the last twenty years, consumers have enjoyed a revolution in connectivity, but communities throughout the nation have also faced the harsh consequences of a vague and voluntary framework that struggles to maintain network service during an emergency. Improving our nation's network resiliency will, at a minimum, require robust roaming support during emergencies; structured joint planning and mutual assistance; and meaningful backup power at high-traffic sites, in businesses, and in homes. While the Commission can incentivize these measures through a mixture of regulatory fee credits and universal service reforms, the Commission also needs to adopt binding rules with a single focus: ensuring Americans can communicate during and in the aftermath of emergencies. A voluntary, unenforceable Framework does not protect the public, and the nation, from harm.

Respectfully submitted,

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