Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	
Ensuring Customer Premises Equipment Backup Power for Continuity of Communications	PS Docket No. 14-174
Technology Transitions	GN Docket No. 13-5
Policies and Rules Governing Retirement Of Copper Loops by Incumbent Local Exchange Carriers	RM-11358
Special Access for Price Cap Local Exchange Carriers	WC Docket No. 05-25
AT&T Corporation Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services	RM-10593
Petition for Declaratory Ruling to Clarify that Technology Transitions Do Not Alter the Obligation of Incumbent Local Exchange Carriers to Provide DS1 and DS3 Unbundled Loops Pursuant to 47 U.S.C. § 251(c)(3)	WC Docket No. 15-1

COMMENTS OF PUBLIC KNOWLEDGE, APPALSHOP, BENTON FOUNDATION, CENTER FOR MEDIA JUSTICE, CENTER FOR RURAL STRATEGIES, COMMON CAUSE, THE GREENLINING INSTITUTE, MEDIA ACTION CENTER, MEDIA LITERACY PROJECT, NATIONAL CONSUMER LAW CENTER, ON BEHALF OF ITS LOW-INCOME CLIENTS, NEW AMERICA'S OPEN TECHNOLOGY INSTITUTE, RURAL BROADBAND POLICY GROUP, AND TURN (THE UTILITY REFORM NETWORK)

Jodie Griffin
Senior Staff Attorney

Edyael Casaperalta
New Venture Fund Internet Rights Fellow
PUBLIC KNOWLEDGE
1818 N Street NW, Suite 410
Washington, DC 20036
(202) 861-0020

Mimi Pickering
Director, Community Media Initiative
APPALSHOP
91 Madison Avenue
Whitesburg, KY 41858

Amina Fazlullah
Director of Policy
BENTON FOUNDATION
1250 Connecticut Ave., NW, Suite 200
Washington, DC 20036

Steven Renderos
National Organizer
CENTER FOR MEDIA JUSTICE
436 14th Street, Suite 500
Oakland, CA 94612

Dee Davis
President
CENTER FOR RURAL STRATEGIES
46 East Main Street
Whitesburg, KY 41858

Todd O'Boyle
Program Director
COMMON CAUSE
1133 19th Street, NW
Washington, DC 20036

Paul Goodman
Legal Counsel
THE GREENLINING INSTITUTE
1918 University Avenue, 2nd Floor
Berkeley, CA 94704

Sue Wilson
Founder
MEDIA ACTION CENTER
4354 Town Center Blvd #114-110
El Dorado Hills, CA 95762

Andrea Quijada
Executive Director
MEDIA LITERACY PROJECT
6400 Wyoming Boulevard NE
Albuquerque, NM 87109

Olivia Wein
Staff Attorney
NATIONAL CONSUMER LAW CENTER, ON BEHALF OF ITS LOW-INCOME CLIENTS
1001 Connecticut Avenue, NW, Suite 510
Washington, DC 20036

Sarah Morris
Laura Moy
Senior Policy Counsel
NEW AMERICA'S OPEN TECHNOLOGY INSTITUTE
1899 L Street, NW, Suite 400
Washington, DC 20036

Edyael Casaperalta
Coordinator
RURAL BROADBAND POLICY GROUP
46 East Main Street
Whitesburg, KY 41858

Regina Costa
Telecom Policy Director
TURN (THE UTILITY REFORM NETWORK)
785 Markel Street, Suite 1400
San Francisco, CA 94103

February 5, 2015

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Public Knowledge, Appalshop, Benton Foundation,[1] Center For Media Justice, Center for Rural Strategies, Common Cause, The Greenlining Institute, Media Action Center, Media Literacy Project, National Consumer Law Center, on behalf of its low-income clients, New America's Open Technology Institute, Rural Broadband Policy Group, and TURN (The Utility Reform Network) ("Public Interest Commenters") respectfully submit the following comments in response to the Commission's Notice of Proposed Rulemaking on issues related to the technology transitions.

I. INTRODUCTION AND SUMMARY

The phone network is a great success story in the history of communications service in the United States. Its ubiquity, affordability, reliability, and openness stimulated economic growth, helped those in need reach emergency first responders, facilitated civic engagement, and allowed millions of people to keep in touch with loved ones regardless of their physical distance. This success story happened because policymakers have for decades been committed to certain fundamental values in the network; namely, competition, consumer protection, universal service, and public safety and national security. As the Commission notes, "We are determined to ensure that these fundamental values are not lost merely because technology changes."[2]

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[1] The Benton Foundation is a nonprofit organization dedicated to promoting communication in the public interest. These comments reflect the institutional view of the Foundation and, unless obvious from the text, are not intended to reflect the views of individual Foundation officers, directors, or advisors.

[2] *Ensuring Customer Premises Equipment Backup Power for Continuity of Communications*, PS Docket No. 14-174, *Technology Transitions*, GN Docket No. 13-5, *Policies and Rules Governing Retirement of Copper Loops by Incumbent Local Exchange Carriers*, RM-11358, *Special Access for Price Cap Local Exchange Carriers*, WC Docket No. 05-25, *AT&T Corporation Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services*, RM-10593, Notice of Proposed Rulemaking and Declaratory Ruling, ¶ 1 (rel. Nov. 25, 2014) ("Tech Transitions NPRM"). *See also id.*, Statement of Commissioner Jessica Rosenworcel ("After all, the enduring values in our law that have shaped our success in the past can also shape our success going forward. So

Public Interest Commenters agree that the Commission should design its policies and rules to encourage the technology transitions.[3] The best way to encourage consumers to adopt new technologies is to give them confidence that those technologies will be a true step forward for them. Right now, some consumers have already decided they are willing to switch to new technologies, even more have adopted new technologies *in addition to* relying on the guarantees of traditional phone service, and some still rely solely on traditional phone service, often because they need some feature or functionality that new technologies do not yet offer.[4] However, if people feel assured that new technologies will be just as ubiquitous, reliable, and affordable, and will operate under the same basic consumer protections, they can transition safe in the knowledge that they will not fall through the cracks in the process.[5]

Taking a responsible approach to the tech transitions requires thinking through all of the potential benefits and harms now, or people will get hurt. Additionally, the Commission cannot make an accurate assessment of the costs and benefits of the transitions if it does not understand the full extent of each. For these reasons it is entirely appropriate here for the Commission to

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as we contemplate big, bold, and historic changes in our infrastructure, our work must be informed by the four basic values that have always been at the core of communications policy—public safety, universal access, competition, and consumer protection. They must be the guideposts for everything we do.").

[3] *See id.*, Statement of Commissioner Michael O'Rielly, Concussing in Part and Dissenting in Part ("…technology transitions… are positive advances that ought to be encouraged…").

[4] *See* Stephen J. Blumberg, *Wireless Substitution: Early Release of Estimates from the National Health Interview Survey, January-June 2014*, U.S. Department of Health and Human Services, Centers for Disease Control and Prevention (Dec. 2014), http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201412.pdf.

[5] *Id.*, Statement of Chairman Tom Wheeler ("[A]s we reach the tipping point at which the older networks and services are turned off, will the transitions to the next generation networks benefit all Americans or will we allow some to fall through the cracks? I firmly believe that we can facilitate the transitions, even while ensuring that the benefits accrue to everyone.").

solicit comment broadly on who is at risk of being left behind in a technology transition, and how we can prevent it.

Public Interest Commenters urge the Commission to establish strong and comprehensive metrics to evaluate new technologies put forward by carriers as potential replacements for existing phone service. Those metrics are the Commission's best avenue for ensuring new technologies will continue to serve the fundamental values of universal service, public safety, competition, and consumer protection *before* those technologies are approved to replace the network that consumers rely on now. But strong, consumer-focused rules will only go so far if the Commission does not pair them with complaint and enforcement mechanisms that give consumers swift redress and deter carriers from allowing the network to fray at the edges.

Public Interest Commenters also urge the Commission to ensure people will continue to have access to communications services during natural disasters or other events involving electrical power outages. Network reliability is especially critical in the days immediately before, during, and after natural disasters or other incidents that can cause power outages, and it is crucial that people stay connected during the times they are most likely to need to call for help or contact loved ones. Based on these reasons and the recommendations of natural disaster preparedness guidelines, Public Interest Commenters urge the Commission to ensure consumers have at least seven days of backup power in case of a power outage.

Finally, the copper retirement process raises significant questions and concerns for the consumers relying on the existing networks. Public Interest Commenters strongly support the Commission's proposal to give consumers a voice in the copper retirement process. Consumers would also benefit from greater clarity regarding the definition of copper retirement, including guidance that establishes when a carrier's neglect of the copper amounts to *de facto* retirement.

At the end of the day, people should always have meaningful access to basic communications service. The Commission's proposals in this proceeding are important steps toward ensuring that goal is a reality for everyone.

II. SERVICE CHANGES SHOULD BE A STEP FORWARD FOR EVERYONE.

There has thus far been wide agreement on the ideas that the transitions should be a step forward for everyone and that public policy should encourage the tech transitions. To the Public Interest Commenters, these goals are intimately related. The best way to encourage people to embrace new technologies is to reassure them that will not have to sacrifice functionality, reliability, safety, or consumer protections when they make the switch. When a new technology can be trusted to offer the same or better service than what customers had before (at the same or better price), customers will have no reason to object to the transition.

However, we must acknowledge that we are not yet at a place where all customers feel they can switch to new network technologies without losing some important function or feature that they rely on in the existing network. Indeed, one recent study found that most Americans still have landline phones at home, and of those people who have both a landline phone and mobile wireless phone, 65% will usually use their landline for the calls they make at home.[6] When looking just at households with annual incomes under $25,000, that figure jumps to 72%.[7] When asked why they pay for both mobile phone service and landline phone service, 82% of respondents said that they keep their landline because of its reliability, 73% pointed to the landline's connection quality, and 45% noted that their landline would continue to work during a

[6] John B. Horrigan, PhD, *Consumers and the IP Transition: Communications Patterns in the Midst of Technological Change* (Nov. 2014), https://www.publicknowledge.org/assets/uploads/blog/Consumers.IP.Transition.FINAL.pdf.

[7] *Id.*

power outage.[8] Additionally 36% of respondents cited support for medical alerts, security systems, or fax machines as a reason they keep their traditional phone line.[9]

Knowing how strongly consumers care about the reliability, quality, support for third-party functions, and affordability of the traditional phone lines, any technology transitions that could jeopardize those features is a serious concern. This is not to say that new technologies cannot offer their own benefits, but that the Commission must ensure the tech transitions are handled responsibly, and that any technology that is eventually deployed in place of the traditional basic service consumers know today is truly equivalent to or better than the current services for everyone.

A. The Commission Should Establish Metrics to Inform Its Evaluation of New Technologies.

The tech transitions have many moving parts and even more interested stakeholders, which is what makes it so critical that consumers and companies alike know what to expect when a carrier wants to transition its network. Public Interest Commenters strongly support the Commission's conclusion that the public and industry stakeholders would benefit from knowing the criteria by which the Commission will evaluate proposed replacement technologies.[10] With that point settled, it now remains for the Commission to determine exactly what those criteria will be.

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[8] *Id.*

[9] *Id.*

[10] Tech Transitions NPRM ¶ 93.

Public Interest Commenters urge the Commission to evaluate new end-user technologies according to the metrics developed by CTC Technology & Energy for Public Knowledge,[11] namely:

- 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.

If a new service fails one of these criteria for a significant portion of the population or for a particularly vulnerable community, the Commission must ensure we find a solution for those issues before granting authorization. Additionally, a "proposed solution" is no solution at all if it only works if consumers alone bear the cost and responsibility of upgrading devices or facilities, while carriers achieve cost-savings without a corresponding decrease in retail and wholesale prices.

When it comes to basic voice service, consumers expect that their phone will act like a phone.[12] The more a phone looks like (and is marketed as) the equivalent of traditional landline phone service, the more likely customers are to expect or assume that service will have the same characteristics as traditional Plain Old Telephone Service (POTS). And these expectations, it should be said, are entirely reasonable. Why would someone assume that something marketed as a newer, better technology would actually be a step backward? If a technology transition results

[11] *See A Brief Assessment of Engineering Issues Related to Trial Testing for IP Transition*, CTC Technology & Energy (Jan. 2014), https://www.publicknowledge.org/files/CTC-PK%20PSTN%20Report.pdf ("CTC Report"). *See also* Tech Transitions NPRM ¶ 94.

[12] *See* Tech Transitions NPRM ¶ 94.

in a service that is it some way inferior to what consumers expected, the fault lies not in the user but in the company that assumed it could use the tech transitions to foist untested services on a country committed to universal, evolving basic communications service. To that end, before policymakers begin evaluating trade-offs in the network compact, we should first seek opportunities to use new technologies to offer better service all around without needing to sacrifice any of the enduring values of the network.

1. Universal Service

Of the questions the Commission poses in the Tech Transitions NPRM, some speak directly to the technical issues involved in fulfilling our country's commitment to achieving universal service.[13]

Crucial to ensuring universal service is making sure that the "service" at issue includes basic call functionality. Many of these functions are so firmly and successfully engrained in our existing network that users take them for granted. Of course, a successful technology transition would allow users to *continue* taking call functionality for granted, because the transition would happen so seamlessly and the new technology would be just as functional as the previous one.

There is no reason technology transitions need to result in services that offer consumers less functionality than they receive now. Similarly, there is no reason technology transitions need to result in a closed, proprietary network where carriers can exert greater control over who users connect to or how. For these reasons, the Commission should consider whether new technologies can support the full range of call functions that are available to users now, including caller-ID services, transport of DTMF tones (*i.e.*, touch tones), third-party long-distance and international

[13] *See* 47 U.S.C. § 151; Tech Transitions NPRM ¶ 96-98. *See also* Ted Gotsch, *The New Network Compact: Making the IP Transition Work for Vulnerable Communities*, Benton Foundation, at 11-15 (2013), https://www.benton.org/sites/benton.org/files/the-new-network-compact-ip-transition.pdf.

calling services, calling cards, dial-around call services, collect calling, and third-number billed calls.[14]

Universal service also means that the network will continue to work for everyone, regardless of disability.[15] The Commission must therefore ensure new technologies will continue to support the communications services relied upon by persons with disabilities.[16] Services like text telephones (TTY), telecommunications devices for the deaf (TDD), and telecommunications relay services (TRS) are still relied upon by a significant number of users. Continuing to support these services is especially important for those who cannot use more recent technologies that offer similar functionality, whether because of pricing, lack of reliable wireless service, or some other obstacle.

Additionally, calls for support for universal service will necessarily raise the fundamental question of what services we want to support. In the context of the tech transitions, the service at the center of the debate is clearly basic voice, but the policy choices made in these proceedings will have very real impacts on other services as well. When a carrier discontinues a service (or changes its physical infrastructure) it can disrupt existing support for heart monitors, security systems, credit card processors, third-party calling services, fax machines, and even Internet access service. For example, if Verizon replaced its copper network with the voice-only fixed wireless service VoiceLink in a particular community, that town would be faced with a new

[14] *See* CTC Report at 25-26.

[15] *See* Tech Transitions NPRM ¶ 96.

[16] *See* CTC Report at 15-18.

"basic" service that does not support many of the service that previously ran over the copper, including Internet access service.[17]

For communities that have other options for Internet access, this type of transition would likely mean people are bumped to their second-choice option, which may mean purchasing a more expensive product or one that does not fit that consumer's needs. But for communities that do not have other Internet access options, this transition would not only impact traditional voice service, but would prevent the better part of entire towns from accessing the Internet. For example, Karen Fasimpaur of Portal, Arizona writes:

> My community straddles the border of Portal, AZ and Rodeo, NM, and is a remote area about 50 miles north of the Mexican border. . . . Those who work do so mainly remotely, as I do with my own business K12 Handhelds. We have no cellular service available in the area, and have been told repeatedly that it is not economically feasible to bring cell service to our area[]. Further the Internet service we have available does not qualify as "broadband." (Most properties cannot get DSL service, and those that can are not at speeds that qualify as broadband as the FCC defines it.).[18]

Finally, if the goal of "universal service" means anything, it must mean that the service offered is actually affordable enough for users to benefit from it. The Commission should therefore consider the cost of new services offered as replacements for existing basic services. Is the new service more expensive for the same functionality? Is the new service the same price as the existing service, but offers less functionality or requires the user to spend considerable sums on new equipment or battery backup? For users across the spectrum—from individuals to schools to small businesses to government offices—the cost of upgrading to new technologies could be substantial. And especially for low-income communities, replacing the existing service

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[17] *See The Phone Network Transition: Lessons from Fire Island*, Public Knowledge (Mar. 7, 2014), https://www.publicknowledge.org/documents/the-phone-network-transition-lessons-from-fire-island.

[18] Letter from Karen Fasimpaur to Chairman Thomas Wheeler, FCC, *et al.*, GN Docket No. 13-5 *et al.* (Feb. 3, 2015).

with a newer, "better" service that users cannot afford to buy is not a step forward at all. Public Interest Commenters recognize that new technologies may allow carriers to offer more expensive options or bundles to consumers, but those options should be made available *in addition to* a robust basic service that is just as affordable as the basic service on the previous network. If we accept anything less, we threaten to leave some of the most vulnerable communities behind in the transitions, instead of seizing the opportunity to improve users' communications services.

2. Consumer Protections and Privacy

As the Commission noted in its unanimous Order authorizing technical trials, new technologies offer opportunities to preserve and improve consumer protections, including privacy, truth-in-billing, number portability, and call routing reliability.[19] When evaluating new technologies, the Commission should consider how well that technology enables and delivers all of these and other consumer protections. Importantly, if the Commission considers how to continue serving basic consumer protection principles on new technologies now, it can avoid facing the kinds of "trade-offs" that could become necessary if the Commission does not think through how to implement consumer protections before the technology is actually deployed as a basic service.

For example, as a significant portion of the population transitions from relying primarily on landline phone service to relying on mobile wireless, the Commission has rightly set out a

[19] *See Technology Transitions*, GN Docket No. 13-5, *AT&T Petition to Launch a Proceeding Concerning the TDM-to-IP Transition*, GN Docket No. 12-353, *Connect America Fund*, WC Docket No. 10-90, *Structure and Practices of the Video Relay Service Program*, CG Docket No. 10-51, *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, CG Docket No. 03-123, *Numbering Policies for Modern Communications*, WC Docket No. 13-97, Order, Report and Order and Further Notice of Proposed Rulemaking, Report and Order, Order and Further Notice of Proposed Rulemaking, Proposal for Ongoing Data Initiative at ¶¶ 65-69 (rel. Jan. 31, 2014) ("Technology Transitions Trials Order").

path forward for ensuring that 911 dispatchers will still receive accurate location information for users calling 911 from indoors using cell phones.[20] The Commission also, however, recognized that developing a database of device locations implicates important privacy and security concerns, and therefore required the database administrator to submit a privacy and security plan for approval before launching the database.[21] In addition to these protections, Public Interest Commenters urge the Commission to consider the remaining privacy concerns that were not addressed in the recent E911 Order in addition to the privacy implications of other new phone network technologies. In the E911 location accuracy context, public interest groups urged the Commission to consider steps like system designs that protect privacy and security in the handset, ensuring that technologies designed to comply with 911 rules do not share information with third parties without users' express consent, and the regulatory status of various types of information obtained through new technologies under the Commission's privacy rules.[22] Public Interest Commenters urge the Commission to take up these issues in the context of the tech transitions, both because they were not fully resolved in the E911 context and because these same questions will inevitably arise in other contexts, like wireline VoIP 911 services.

Stakeholders from all sides have committed to pursuing policies that encourage the tech transitions. Public Interest Commenters agree. For consumers, encouraging the tech transitions means giving the network's users assurance that they will have the same or better protections on new networks as they had on the previous ones. Forcing customers to choose between enjoying

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[20] *See Wireless E911 Location Accuracy Requirements*, PS Docket No. 07-114, Fourth Report and Order (rel. Feb. 3, 2015).

[21] *Id.* ¶¶ 68-71.

[22] *See* Letter from Laura Moy, New America Open Technology Institute, *et al.*, to Tom Wheeler, Chairman, FCC, *et al.*, PS Docket No. 07-114 (Jan. 13, 2015), http://apps.fcc.gov/ecfs/document/view?id=60001013237.

strong consumer protections and adopting new technologies will only delay the tech transitions. In contrast, if the Commission ensures that customers can continue to rely on robust consumer protections on new technologies, customers will be more likely to adopt new technologies when they are ready for real-world implementation.

Just as the available consumer protections impact whether a technology transition is truly a step forward, the regulatory classification of the new technology should be considered in the § 214(a) process as well. If a carrier wishes to replace its existing service with a service that is not governed by Title II of the Communications Act, the resulting loss of regulatory protections would inherently be an impairment of service. Whether by technology or by law, if consumers lose their privacy in a tech transition, their service has been impaired. If customers are no longer protected by truth-in-billing rules as a result of the tech transitions, their service has been impaired. If people were guaranteed just, reasonable, and non-discriminatory service before a transition and are not afterwards, their service has been impaired. The Commission should therefore rule that replacing a Title II service with a non-Title II service is inherently an impairment of service that adversely affects the public convenience and necessity under § 214(a).

3. Competition

Public Interest Commenters are encouraged that the Commission's NPRM considers several aspects of the technology transitions' impact on competition.[23] Although many of the competition issues the Commission seeks comment on here directly face competitive carriers, the

[23] Tech Transitions NPRM ¶¶ 55-59, 102-113.

continued viability of competition in the network brings significant benefits to end-users, particularly by lowering costs for small businesses.[24]

Public Interest Commenters support the Commission's proposal to require Incumbent Local Exchange Carriers (ILECs) to commit to providing equivalent wholesale access on equivalent rates, terms, and conditions.[25] Commenters also support the competitive standards proposed by Windstream as a framework for determining what equivalence means, namely: that price per Mbps should not increase, wholesale rates should not exceed retail rates, basic service pricing should not increase, bandwidth options should not be reduced, there should be no backdoor price increases, and there should be no impairment of service delivery or quality.[26] These standards are clear, objective, and designed to simply ensure that technology transitions are a step forward for competition, not a step backward. After all, there is no reason that a newer, better technology should lead to higher prices for equivalent or inferior service. Public Interest Commenters therefore support standards that ensure competition will not be harmed as a result of the transitions.

Finally, Public Interest Commenters support the Petition for Declaratory Ruling filed by Windstream Corporation to clarify that technology transitions do not alter ILECs' obligations to provide DS1 and DS3 unbundled loops.[27] An ILEC's decision to transition to IP or from copper

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[24] *See* Ted Gotsch, *The New Network Compact: Making the IP Transition Work for Vulnerable Communities*, Benton Foundation, at 27-33 (2013), https://www.benton.org/sites/benton.org/files/the-new-network-compact-ip-transition.pdf.

[25] Tech Transitions NPRM ¶ 110.

[26] *See id.* ¶ 111.

[27] *See* 47 U.S.C. § 251(c)(3); Petition for Declaratory Ruling of Windstream Corporation, *Petition for Declaratory Ruling to Clarify that Technology Transitions Do Not Alter the Obligations of Incumbent Local Exchange Carriers to Provide DS1 and DS3 Unbundled Loops Pursuant to 47 U.S.C. § 251(c)(3)*, WC Docket No. 15-1, *Technology Transitions*, GN Docket No. 13-5 (Dec. 29, 2014); *contra Public Notice of Network Change Under Rule 51.333(a) for*

to fiber does not change the fact that competitive carriers are impaired in providing competitive services without access to ILECs' DS1 and DS3 capacity loops.[28] The Commission's findings that there are substantial barriers to entry for competitive deployment of loops and that competitive carriers face large fixed, sunk, and operational costs in deploying and operating their own facilities are not changed by an ILEC's decision to transition its facilities to a new technology.[29] Under the Commission's rules, an ILEC has an obligation to provide unbundled DS1 and DS3 capacity loops unless it establishes that the basis for a finding of non-impairment has been met—short of any change in rule or forbearance decision by the Commission.[30] If ILECs wish to change that rule, they can petition for forbearance or a new rulemaking under the Commission's procedures. In the meantime, it is important that the Commission continue to protect the competition that exists in the network now, in addition to pursuing policies to encourage more competition to benefit consumers.

4. Public Safety, Security, and Network Reliability

Finally, it is critical that the Commission closely examine the public safety, cybersecurity, and reliability impacts of new technologies before allowing them to replace the nation's current critical information infrastructure.[31]

Midlothian, VA, Verizon (last visited Feb. 5, 2015) http://www.verizon.com/about/networkdisclosures/; Letter from Robert C. Barber, AT&T, to Marlene H. Dortch, FCC, GN Docket No. 13-5, *et al.*, at 11 (May 30, 2014).

[28] *See Unbundled Access to Network Elements, Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers*, Order on Remand, 20 FCC Rcd. 2533, 2536 ¶ 5 (2005).

[29] *See id.* at 2616-17, 2625.

[30] *See* 47 C.F.R. § 51.319(a)(4)-(5).

[31] *See* Tech Transitions NPRM ¶ 100.

Public Interest Commenters urge the Commission to protect public safety systems by ensuring customers will continue to be able to connect to the correct PSAP during an emergency and that 911 dispatchers will be able to provide the same quality of response to callers using new technologies as they could pre-transition. Specifically, the Commission should require that new technologies reliably provide the correct identifying information for each call in the correct format for the PSAP, including accurate location information.[32] New networks should also be able to support reverse 911 functions, which in urban areas can typically support 5,000 30-second calls in less than 10 minutes.[33]

The Commission should also ensure new network technologies do not introduce new security vulnerabilities.[34] This is not idle speculation: we have already seen VoIP denial-of-service attacks on 911 PSAPs, in which an influx of non-emergency calls intentionally overload the PSAP's system.[35] The Commission should therefore ensure that new technologies can withstand attacks at least as well as the existing network does before they are deployed in place of existing networks. To determine new technologies' security, the Commission should consider the degree to which the network is vulnerable to being shut down or damaged by an attack, the network's points of failure, the ability to impersonate other users on the network, whether attackers could maliciously disconnect or activate other devices on the network, and the ability to

[32] *See* CTC Report at 20-23. For example, the Commission has recently acknowledged the lack of location accuracy requirements for wireless 911 calls made from indoors and set up new location accuracy requirements. *See Wireless E911 Location Accuracy Requirements*, PS Docket No. 07-114, Fourth Report and Order (rel. Feb. 3, 2015).

[33] CTC Report at 22-23.

[34] *See* Tech Transitions NPRM ¶ 99.

[35] CTC Report at 23 (citing David Kahn, *The Growing Threat to PSAPs from Telephone Denial of Service (TDoS) Attacks*, 911 MAGAZINE (July 3, 2013), http://www.9-1-1magazine.com/Kahn-Threat-of-TDoS-Attacks.).

generate spoofed calls.[36] Carriers should be able to explain to the Commission what steps they have taken to secure new networks and what testing they have conducted. The Commission should review these reports to compare them to industry best practices and the security metrics of the existing network.

Additionally, the Commission should consider the basic reliability metrics of new network technologies, including call persistence.[37] On a very basic level, one of the best (and defining) attributes of the traditional phone network has been that *it just works*. People know that when they want to place a call via traditional landline phone service it will go through and will continue to work properly until they hang up. Even more, some uses of the wireline phone network, like monitoring applications, *require* persistence to function. When a carrier proposes to replace the existing network with a new technology, the Commission should therefore first consider how long a call persists on that new technology under a range of circumstances. Public Interest Commenters propose that the standard for call persistence should be at least one week.[38] Even after an application to transition the network has been approved, the carrier should submit periodic reports on call persistence to the Commission, to ensure reliability does not decrease after approval.

B. The Commission Should Establish Strong Enforcement Mechanisms to Effectuate Its Rules.

Of course, even the strongest standards for technology transitions will have little practical impact if the Commission does not match it with strong enforcement mechanisms and procedures that provide effective redress to complaints. The Commission has broad enforcement

[36] *See* CTC Report at 23-24.

[37] *See* Tech Transitions NPRM ¶ 98.

[38] *See* CTC Report at 24-25.

authority to ensure parties follow the law,[39] including requirements: ensuring that telecommunications carriers provide communications service upon reasonable request;[40] that charges and practices for and in connection with telecommunications services are just and reasonable;[41] that common carriers do not unjustly or unreasonably discriminate in their charges or practices;[42] and that carriers do not discontinue, reduce, or impair service without the Commission first certifying that doing so will not adversely affect the public convenience and necessity.[43]

In the tech transitions, there appears the serious possibility that a carrier could pursue a transition of such magnitude that paying relatively small fines to resolve individual complaints would not sufficiently deter the carrier from failing to maintain its basic service. Public Interest Commenters therefore urge the Commission to ensure its enforcement procedures and remedies sufficiently deter carriers from engaging in harmful behavior, including failing to maintain adequate service quality or respond to consumer complaints.

Effective enforcement mechanisms must also include transparency measures. Requiring reports on service quality, consumer and competitor complaints, and carriers' response and repair times will allow the Commission to determine when consumers are experiencing degraded service or when the carrier may be neglecting its network. Transparency will allow all parties involved to more fully understand the impact of tech transitions and more easily detect inadequate or discriminatory service.

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[39] *See* 47 U.S.C. §§ 208, 501-504; 47 C.F.R. §§ 1.80-1.95.

[40] 47 U.S.C. § 201(a).

[41] 47 U.S.C. § 201(b).

[42] 47 U.S.C. § 202.

[43] 47 U.S.C. § 214(a).

III. THE COMMISSION SHOULD ENSURE CONSUMERS' CONNECTIONS STILL WORK DURING POWER OUTAGES.

Telephone carriers have traditionally used copper wires to bring service to homes and businesses. Copper carries electricity to the customer's premises, which powers the telephone connection even during a power outage. In addition, all other devices that need the telephone to function properly, such as cardiac arrest monitors or Life Alert alarms, are also able to function. Thus, as long as a telephone carrier arranges backup power at its central location, basic telephone service can continue to work during power outages.[44] This is an invaluable characteristic of the traditional telephone network. It taught the public that their telephone is reliable and that they can reach 911 even during extreme circumstances. In contrast, the new technologies we see today are not self-powered through the line. Thus, the tech transitions could mean that telephone service, devices that depend on the traditional network, and 911 access are not guaranteed to work during power outages.

A. The Commission Must Include Basic Communications Services Via All Technologies in the Scope of CPE Backup Power Requirements.

Traditional telephone service, VoIP, 911, and E911 are all services the Commission should include in the scope of customer premises equipment (CPE) backup power requirements.[45] Because consumers have learned to expect their telephone will work even during a power outage, we recommend that requirements to provide backup power apply to ***all*** carriers providing basic fixed telephone service, managed VoIP, 911, and E911, across all types of technologies. Public Interest Commenters recommend the Commission define "fixed" service as any service that is advertised as such and / or relies on two fixed location points to communicate

[44] *See* David Gabel and Steve Burns, *The Transition from the Legacy Public Switched Telephone Network to Modern Technologies*, National Regulatory Research Institute (2012).

[45] *See* Tech Transitions NPRM ¶ 33.

wirelessly. Defining "fixed" would help clarify to providers of such services that they will be required to provide backup power service. This would also help clarify to customers what they can expect from their carriers for backup power support.

Several devices that consumers have come to rely on for safety and commerce need to be able to communicate with a working telephone at any moment to function. Devices such as, but not limited to, medical alert and home security alarm systems, cardiac arrest monitors, and fax and credit card machines work properly only when the telephone line they are connected to also works properly. Some of these devices prove their purpose only during emergencies, such as LifeWatch. The LifeWatch system is plugged into a telephone jack the way a telephone answering machine is plugged in.[46] When an injured individual presses the LifeWatch panic button, the system uses the consumer's telephone line to initiate a call between the LifeWatch support team and the injured party. It is precisely during emergencies when our telephone network should not fail the most vulnerable, which is why the Commission should ensure consumers can rely on the network even during power outages.

The Commission should also consider every service that supports the safety of consumers as a "minimally essential" service that must retain power during an outage.[47] Minimally essential services include the ability to make calls to 911, medical alert systems, and family. The ability to receive information from emergency alerts and warnings, and to transfer information from cardiac arrest monitors or any other medical monitor that depends on a powered telephone network is essential for consumers who are already dealing with a power outage and perhaps a natural disaster. Minimally essential services should also include the ability to send text, video,

[46] LifeWatch USA (last visited Feb. 5, 2015), http://www.lifewatch-usa.com/questions.html.

[47] Tech Transitions NPRM ¶ 34.

or data to 911. This is particularly important as we move to Text-to-911, E911, and Next Generation 911 technologies.

Carriers should not configure CPE to only receive emergency alerts or only support 911 during a power outage. During natural disasters and emergencies, consumers typically want to communicate with their family and loved ones to confirm everyone's safety. A consumer may also want to reach a hospital, shelter, or school. Configuring CPE to only receive emergency alerts and support 911 would obstruct the ability of the customer to make these calls. In addition, some of the devices that consumers use for safety, such as a cardiac arrest monitor, need to communicate with entities beyond 911. Configuring CPE to only receive emergency alerts and support 911 would obstruct the ability of these devices to function.

Incorporating a default "turn off" mode for communication services that a service provider can control to preserve backup power would need to be tested rigorously before being deployed, and once deployed, would need to be used with extreme caution.[48] The consumer must retain as much control as possible of the devices she uses in her home because she knows best how and when she will use those devices. If a service provider is able to make decisions on behalf of a consumer regarding the operation of the devices the consumer uses at home, miscommunication and general malfunctions can potentially put customers in danger. This measure could also jeopardize the functionality of cardiac arrest monitors and other devices that need to be "on" and able to reach emergency responders at a moment's notice. A better option would be to incorporate a "turn off" or "low energy" setting on a backup power device that the consumer has control over.

[48] The Commission could require carriers to report on how they will and do use this mechanism to ensure customers are not losing access to critical communications services.

B. It Is Reasonable and Necessary for Carriers to Continue to Bear Primary Responsibility for Backup Power.

The reliability of the old telephone network made it invaluable to consumers. Beyond paying their bills and ensuring their handsets were functioning properly, consumers have not had to educate themselves on the deep technology of their telephone service. Before the Commission assigns the responsibility for backup power primarily to consumers, we need to provide thorough and comprehensive education to the public about this new responsibility and how to prepare for outages. Thus, at this moment, it is reasonable for carriers to continue to bear primary responsibility for backup power.[49] Imposing responsibility for backup power on consumers would require a cultural and educational shift before the Commission could implement a legal shift. Backup power is too important a matter to have telephone carriers test it out on the field or suddenly place the responsibility on consumers.

Americans have come to expect the indefinite reliability of the basic telephone network, particularly during power outages caused by natural disasters and other emergencies. The Commission should require telephone carriers to make the necessary arrangements to ensure a minimum of seven days of backup power during power outages. We arrive at this time requirement by looking at the advice the Texas Department of Public Safety provides for residents living in disaster-prone coastal areas.[50]

Coastal areas are a prime example of the urgent need of backup power responsibility and preparedness. According to the National Hurricane Center, areas along the Gulf of Mexico

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[49] Tech Transitions NPRM ¶ 35.

[50] *Post-Storm Preparedness: Plan for Lengthy Power Outages*, Texas Department of Public Safety (last visited Feb. 5, 2015), http://www.txdps.state.tx.us/dem/ThreatAwareness/PowerPlan.htm.

experience hurricane season from June 1st to November 30th.[51] This means residents along the Texas, Louisiana, Mississippi, Alabama, Florida, and Georgia coasts must prepare to have long-term backup power five months out of the year. Texas DPS advises its residents, including those living inland, to prepare for Post-Storm lengthy power outages:

> If you live in a coastal area that is NOT in a hurricane evacuation zone, it is important to make plans for surviving without electricity for three to seven full days. Most serious storms will knock out electricity and scatter debris across widespread areas. Trees and power lines will be down. Once the storm has passed, it may take 72 hours – three full days – before supplies of food, water and ice can be moved to distribution areas. Depending on storm damage, it may take much longer to restore electric power. Retail stores cannot re-open until roads are cleared and electric power restored. Restoring electricity neighborhood by neighborhood may take days or even weeks."[52]

A mild hurricane or tropical storm could do minimal damage and/or cut power for a brief amount of time. However, a stronger storm can cut electricity for days and even weeks to an entire region. Extreme weather events could also have an impact on the overall infrastructure of a community, including roads, businesses, schools, hospitals, and grocery stores. During and after a natural disaster, the telephone network stands out as a stalwart of safety that allows families to stay in touch, businesses to jump back into commerce, and communities to rebuild.

The reliability of our telephone network should not be limited by the technology transitions. Similarly, the ability of communities to recuperate after a disaster should not be restricted by an unreliable communications network. The Commission's proposal for eight or even 24 hours of backup power is not sufficient time to meet Americans' safety needs. Public

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[51] National Weather Service, National Hurricane Center (last visited Fe. 5, 2015), http://www.nhc.noaa.gov/.

[52] *Post-Storm Preparedness: Plan for Lengthy Power Outages*, Texas Department of Public Safety (last visited Feb. 5, 2015), http://www.txdps.state.tx.us/dem/ThreatAwareness/PowerPlan.htm.

Interest Commenters believe seven days is a reasonable backup time requirement that helps consumers remain safe before and during a natural disaster, and rebuild after the event.

As the Commission considers whether to assign responsibility of backup power on consumers, it must understand the expense that this responsibility would impose on many Americans, and the Commission must consider whether these costs could even be met by low-income, fixed-income, and rural Americans. As an example, Verizon's FiOS Digital Voice service is a non-self powered technology a consumer may use as his basic telephone service that uses battery backup. On its website, Verizon states that FiOS service provides eight hours of backup power via a proprietary 12-Volt 7.2 Ah SLA (Sealed Lead Acid) battery.[53] The actual duration time of the battery depends on its use—the more calls placed, the more quickly the backup power is depleted.[54]

After the eight hours of backup power the FiOS proprietary battery provides, there are still sixteen hours left in the day. A consumer can purchase more batteries from Verizon priced at $39.99 each.[55] Taking into account the first eight hours of backup power provided by Verizon, a FiOS customer would pay $80 for the first day of backup power, $320 for three days, and $800 for one week.[56] This example indicates that a resident of a coastal area in the United States must be able to pay for over $800 in backup power devices that would assure his safety for one week—provided that he never actually needs to use the phone during that week, in which case he would need to have even more battery backup. This is a considerable new expense that

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[53] *Loss of Power or Broadband Outage*, Verizon (last visited Feb. 5, 2015), http://www.verizon.com/support/residential/phone/homephone/general+support/fios+voice+service/fvs/121220.htm.

[54] For this reason, describing battery life in terms of "talk-time" is a more useful metric.

[55] *Id.*

[56] Costs are calculated before-tax.

consumers are not aware of and that millions of people will not be able to afford. For example, millions of people subscribe to the Lifeline Program simply to be able to afford basic telephone service. Additional expenses for battery backup power would impose a real and likely unaffordable cost on low-income, fixed-income, and rural Americans as a result of the tech transitions. As a practical matter, even if battery backup is very difficult but not impossible for a household to afford, the added burden would mean that millions of homes would simply go without backup power and would be at serious risk of harm during a natural disaster or other power outage.

The savings carriers would realize in deploying new technologies could in part be used to cover the costs of providing seven days of backup power to their customers. However, carriers should not be taking in cost savings as increased profits while tacking on the costs of new CPE backup power on consumers in an effective increase of basic service prices. Consumers already have access to near indefinite backup power via traditional technologies. The Commission must consider all the implications of retiring a life-saving benefit imbedded in an existing technology for the potential benefits and flaws of a new technology.

C. Carriers Must Prioritize Adoption of Backup Batteries and Devices that Can Last for Days and Are Not Proprietary.

In the event the Commission decides to place CPE backup power responsibility primarily on consumers, carriers must prioritize the adoption of devices that use batteries that can last days and are not proprietary.[57] Carriers must find ways to ensure batteries can be used in telephone devices using fiber, VoIP, or wireless technologies. A battery that lasts longer would provide more network reliability to the carrier and peace of mind to the consumer. Finally, commercial batteries could offer consumers more affordability and backup power time. If the Commission

[57] Tech Transitions NPRM ¶ 36.

places backup power responsibility on consumers, it must ensure they are not tied to a specific carrier, battery, or time limit, but instead are empowered to define their own safety plan.

Market incentives alone could not deliver sufficient backup power to vulnerable communities in the United States because these—rural, low-income, and fixed-income—typically outside of the interest of the market. It is in these communities where the role of the Commission as a protector of the public interest is most needed.

D. The Commission Must Deploy a National Tech Transitions Public Education Campaign in Partnership with Carriers, State Agencies, and Grassroots Organizations.

Whether backup power responsibility lies primarily with carriers or consumers, the Commission must develop and enact a nation-wide comprehensive technology transitions campaign educating consumers about the changes to basic telephone service and any new responsibilities they will bear as a result.[58] The Commission must coordinate this campaign along with state agencies (including Public Utilities Commissions, Offices of Consumers' Counsel, and Departments of Public Safety), public interest and grassroots organizations, *and* carriers. Materials must be published in multiple languages and formats accessible to persons with disabilities, and distributed in various forums, including online, telephone, print, mail, radio, and television.

As a public agency tasked with protecting the public interest, the Commission must educate and empower consumers through a national education campaign about technology transitions. Resources for this campaign should include a guide that educates consumers about the kind of technologies new telephone services will use and how these technologies impact the

[58] *See* Tech Transitions NPRM ¶¶ 38-40.

reliability of their service, and a guide that compares backup power options (batteries, UPC power sources, gas powered generators, etc.), their durability, reliability, and affordability.

Service providers are a crucial component of this campaign. They are directly in touch with consumers and uniquely positioned to share all information about changes to the telephone network and the service consumers receive. We propose the Commission require carriers to be partners in this education campaign, but monitor the communications from carriers to consumers for accuracy and neutrality. For example, a carrier should be required to provide every new customer with informational materials the Commission has created about the technology transitions. These materials should also be shared with consumers who are switching services or making adjustments to their existing service. The Commission should also coordinate educational activities with natural disaster and preparedness initiatives such as the National Hurricane Preparedness Week program.

IV. CONSUMERS MUST HAVE NOTICE AND BE PROTECTED DURING NETWORK CHANGES.

A. Copper Retirement and *De Facto* Copper Retirement Can Have Serious Impacts for Consumers.

Public Interest Commenters are deeply concerned by the number and geographic variety of complaints across the country, in which consumers report difficulty obtaining prompt copper line repairs or report that they are told they do not have the option to continue using a basic service before or after transitions. Among other issues, this raises the concern that some carriers are attempting to effectively retire their copper plant without going through the copper retirement process. Public Interest Commenters therefore urge the Commission to ensure its copper retirement rules prevent carriers from leaving customers behind and give consumers a voice in the copper retirement process.

Public Interest Commenters support the Commission's proposal to define copper retirement as the removing or disabling of copper facilities.[59] The Commission should further specify that "removing or disabling" a facility goes beyond just physically removing the copper. If the copper facility or a portion thereof is rendered inoperable due to the carrier's neglect or failure to repair the network, the carrier is effectively retiring its copper and should go through the necessary regulatory process to do so. The Commission may need to establish procedures for temporary damage to the network, but Public Interest Commenters urge the Commission to bear in mind that a network that is disabled for two or three months may be "temporary" in the context of a corporation's multi-year plans, but can still have a devastating impact on the people and businesses who need that network during those months.

Relatedly, the Commission seeks comment on whether ILECs are neglecting their copper facilities and the issue of *de facto* retirement.[60] Indeed, the number of complaints we have already seen from consumers reporting that they were told they had to transition to new technologies or could not opt for the basic service anymore is alarming.[61] The Commission could take a number of approaches to stopping and preventing inadequate copper maintenance and repair. Public Interest Commenters urge the Commission to investigate allegations of carriers failing to maintain their networks or offer basic service to ensure customers receive quick and

[59] *See* Tech Transitions NPRM ¶ 52. Public Interest Commenters also support the Commission's proposal to include the entire copper facility, including copper loops, subloops, and the feeder portion of the loop, in the scope of copper retirement *See id.* ¶ 51.

[60] *Id.* ¶ 53.

[61] *See* Letter from Jodie Griffin, Senior Staff Attorney, Public Knowledge, *et al.* to Julie A. Veach, Chief, FCC Wireline Competition Bureau, GN Docket No. 12-353, GN Docket No. 13-5, RM-11358, WC Docket No. 10-188, GN Docket No. 09-51 (May 12, 2014).

effective redress.[62] The Commission should also require ILECs to periodically report on certain service metrics, like service quality, number of complaints, and the time necessary to resolve complaints. This would both help the Commission compare proposed new technologies to existing service, and ensure that service quality and complaint responsiveness does not diminish.

Public Interest Commenters also urge the Commission to establish a process for situations where a network is damaged after a natural disaster and the carrier at some point decides that it will permanently replace that network with a new technology.[63] We have already seen the unnecessary confusion and delay that can result when carriers and consumers lack guidance from regulators for how to rebuild or replace networks after a natural disaster.[64] Communities are relying on the Commission to clarify how § 214(a) procedures operate in the days of rebuilding after a natural disaster, and especially so in the states that have stripped their state commissions of authority to step in to protect consumers. The Commission should specify at what point a carrier must file a § 214(a) application, and how it should notify customers and businesses that may be displaced after a natural disaster.

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[62] The Commission's recently revamped Consumer Help Center is an important step in ensuring consumers can easily file complaints and learn about common consumer issues in communications services. *See* Consumer Help Center, FCC (last visited Feb. 4, 2015), https://consumercomplaints.fcc.gov/hc/en-us. The consumer complaint data that the Commission has made available as part of its new consumer help webpage is also valuable to advocates and members of the public seeking to understand what problems consumers have run into on various communications platforms.

[63] *See* Letter from Public Knowledge *et al.* to Mignon Clyburn, Chairwoman, FCC, WC Docket No. 12-353, GN Docket No. 13-5, WC Docket No. 13-150, WC Docket No. 13-149 (July 25, 2013), https://www.publicknowledge.org/files/postdisasterrecoveryletter7-25.pdf.

[64] *See The Phone Network Transition: Lessons from Fire Island*, Public Knowledge (Mar. 7, 2014), https://www.publicknowledge.org/documents/the-phone-network-transition-lessons-from-fire-island.

B. Consumers Should Have a Voice in the Network Change Process.

The technology transitions make it even more critical that the copper retirement process operate transparently, provide opportunity for public participation, and ensure consumer protections.[65] Copper retirement can significantly alter the functionalities consumers have relied upon for decades. When carriers implement changes that can impact the reliability or functionality of the network, customers should have notice of what changes are going to happen and be given time to comment on those changes before the Commission.

Public Interest Commenters support the Commission's proposal to require ILECs to notify retail customers during the network change notification process.[66] The Commission should require that such notices be delivered to all customers in an affected area, because the ILECs by their own admission do not necessarily know what CPE or third-party services each customer uses.[67] Notices must therefore be sent to all potentially affected customers that include a description of the types of CPE or third-party services that may not be supported after the network change, so customers have meaningful notice of how network changes will impact them.[68]

The Commission rightly proposes to require ILECs to notify customers when they will still be able to purchase the same service with the same functionalities and features after the

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[65] *See* Tech Transitions NPRM ¶¶ 55, 60.

[66] *Id.* ¶¶ 60, 77-78.

[67] *See* United States Telecom Association's Reply in Support of Petition for Reconsideration, *Ensuring Customer Premises Equipment Backup Power for Continuity of Communications*, PS Docket No. 14-174, *Technology Transitions*, GN Docket No. 13-5, *Policies and Rules Governing Retirement of Copper Loops by Incumbent Local Exchange Carriers*, RM-11358, *Special Access for Price Cap Local Exchange Carriers*, WC Docket No. 05-25, *AT&T Corporation Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services*, RM-10593, at 7-8 (Jan. 30, 2015).

[68] *See* Tech Transitions NPRM ¶¶ 61-65.

network change.[69] If an ILEC cannot make that guarantee to its customers, it must tell customers exactly what changes will happen to their service in clear, understandable terms, and the ILEC may need to also file a § 214(a) application to discontinue, reduce, or impair service.[70]

C. Consumers Must Have a Meaningful Option for Basic Service.

People cannot take advantage of a basic telecommunications service offering if they do not know it exists. Reports of carriers telling customers they must upgrade their service or failing to tell customers that they have the option to purchase basic service undermine decades of national policy designed to make affordable basic communications available to everyone.

Public Interest Commenters are very concerned by reports that consumers are not being informed of their options for basic service or are effectively being forced onto new services or facilities that may not provide the functionalities they need.[71] To prevent this lack of information or misinformation in the future, Public Interest Commenters support the Commission's proposal to require a "neutral statement of the various choices that the LEC makes available to retail customers affected by the planned network change."[72] The Commission should ensure this statement gives a plain-language description of the customer's service options and that the statement also explains clearly to consumers their options to file comments on the proposed network change, or to contact the Commission and any relevant state commissions for more information about phone service issues.

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[69] *See id.* ¶ 65.

[70] *See id.* ¶ 65.

[71] *See* Letter from Jodie Griffin, Senior Staff Attorney, Public Knowledge, *et al.* to Julie A. Veach, Chief, FCC Wireline Competition Bureau, GN Docket No. 12-353, GN Docket No. 13-5, RM-11358, WC Docket No. 10-188, GN Docket No. 09-51 (May 12, 2014); Tech Transitions NPRM ¶¶ 65, 71.

[72] *See* Tech Transitions NPRM ¶ 72.

Once the Commission has established requirements for the contents of consumer network change notices, ILECs should certify compliance with the Commission, including submitting copies of the consumer notices. The Commission has strong authority to implement all of the above-mentioned rules under § 251(c)(5),[73] in addition to its authority under § 201, § 202, and § 4(i).[74] In taking action to ensure consumers have accurate and timely notice of network changes that could impact the functionality and interoperability of their devices or third-party services, the Commission would be giving clarity to what is considered "reasonably public notice" of changes that impact the transmission, routing, and interoperability of services on the network.[75]

V. CONCLUSION

The tech transitions have many moving parts, each with the potential to create huge impacts on the future of basic communications services for customers across the country. In this NPRM, the Commission is taking the right approach of examining some of the most pressing issues now, before we are even further in the transition. Public Interest Commenters urge the Commission to establish rules that will create certainty and protect consumers of basic phone service, regardless of what technology they use to communicate.

[73] 47 U.S.C. § 251(c)(5) ("The duty to provide reasonable public notice of changes in the information necessary for the transmission and routing of services using that local exchange carrier's facilities or networks, as well as of any other changes that would affect the interoperability of those facilities and networks.").

[74] 47 U.S.C. §§ 154(i), 201, 202.

[75] 47 U.S.C. § 251(c)(5).

Respectfully submitted,

/s/
Jodie Griffin
Edyael Casaperalta

PUBLIC KNOWLEDGE
1818 N Street, NW, Suite 410
Washington, DC 20036

February 5, 2015