

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

In the Matter of

Accelerating Wireline Broadband Deployment
by Removing Barriers to Infrastructure
Investment

WC Docket No. 17-84

Declaration of Susan M. Baldwin

On behalf of

**THE NATIONAL ASSOCIATION OF STATE UTILITY CONSUMER ADVOCATES,
MAINE OFFICE OF THE PUBLIC ADVOCATE, MARYLAND OFFICE OF PEOPLE'S
COUNSEL, NEW JERSEY DIVISION OF RATE COUNSEL, OHIO OFFICE OF THE
CONSUMERS' COUNSEL, PENNSYLVANIA OFFICE OF CONSUMER ADVOCATE
AND THE UTILITY REFORM NETWORK**

June 15, 2017

Table of Contents

| | |
|---|----|
| I. INTRODUCTION..... | 1 |
| Qualifications | 1 |
| Scope of Declaration | 2 |
| Summary..... | 3 |
| II. STATE PUCS' ROLE IN ENSURING ADEQUATE RELIABLE SERVICE | |
| 10 | |
| Overview | 10 |
| Verizon stopped investing in fiber long before the 2015 Technology Transition, and factors other than regulatory barriers appear to have driven its decisions..... | 13 |
| California | 17 |
| Iowa | 18 |
| Maryland..... | 22 |
| New Jersey..... | 26 |
| New York | 28 |
| Pennsylvania..... | 31 |
| Functional Equivalency | 35 |
| III. ECONOMIC INCENTIVES DURING THE IP TRANSITION | 39 |
| IV. CONCLUSION | 41 |

Appendix A Statement of Qualifications

I. INTRODUCTION

Qualifications

1. My name is Susan M. Baldwin. My address is P.O. Box 392, Newburyport, Massachusetts, 01950. I am an independent consultant.
2. I have 38 years of experience in public policy in the public and private sectors, more than 30 of which are in telecommunications regulation and policy. I have testified before 21 state public utility commissions in more than 65 state regulatory proceedings, and have graduate degrees in economics and in public policy. I have extensive experience analyzing the quality and affordability of “traditional” basic local exchange service. Over the years, I have also participated in numerous proceedings in which network transition and network modernization matters have been investigated, ranging from investigations in the 1990s of the deployment by incumbent local exchange carriers (“ILECs”) of Integrated Services Digital Network (“ISDN”) service and replacement of electromechanical switches in rural communities; to carrier-to-carrier interconnection issues in the 1990s and 2000s; to the deployment of digital subscriber line service and to the more recent deployment of Voice over Internet Protocol (“VoIP”), broadband Internet access services, and fixed wireless services. Appendix A to my Declaration includes my Statement of Qualifications.
3. I have been advising state regulators on service quality and have testified and submitted affidavits on network maintenance, service quality and network

transition matters in numerous federal and state proceedings for almost 30 years.¹

As part of my analyses, I reviewed detailed public and confidential information regarding the condition of copper networks, ILECs' performance relative to service quality metrics established by state public utility commissions, and consumer complaints about network transition and service quality matters. I also analyzed the service quality data that ILECs were previously required to submit to the FCC pursuant to the Automated Reporting Management Information System ("ARMIS") requirements that once applied. I have analyzed ILECs' economic incentives to provide adequate and reliable service quality in the context of alternative forms of regulation, mergers, and the status of competition existing in local markets.

4. In the context of state and federal regulatory proceedings, I have also analyzed detailed public and confidential information pertaining to the cost, speed, price and availability of ILECs' broadband Internet access services, both existing and planned, as well as barriers to such deployment.

Scope of Declaration

5. The National Association of State Utility Consumer Advocates, Maine Office of the Public Advocate, Maryland Office of People's Counsel ("OPC"), New Jersey Division of Rate Counsel, Office of the Ohio Consumers' Counsel, Pennsylvania Office of Consumer Advocate and The Utility Reform Network (collectively,

¹ Early in my career, in 1989, I undertook an in-depth analysis of service quality data and the status of network modernization in the context of an investigation of New England Telephone and Telegraph Company's operations in Massachusetts. Then, as is now often the case, regulators' concern focused in part on the uneven level of service quality offered to consumers and the uneven deployment of then state-of-the-art technology in various communities.

“Consumer Advocates”) asked me to address the impact of certain proposals in the Notice of Proposed Rulemaking (“NPRM”), Notice of Inquiry (“NOI”), and Request for Comment (“RFC”) issued by the Federal Communications Commission (“FCC”)² on consumers’ access to reliable, safe, and adequate telephone service.

Summary

6. The FCC says it “seeks to better enable broadband providers to build, maintain, and upgrade their networks, which will lead to more affordable and available Internet access and other broadband services for consumers and businesses alike” and also asserts that its “actions propose to remove regulatory barriers to infrastructure investment at the federal, state, and local level; suggest changes to speed the transition from copper networks and legacy services to next-generation networks and services; and propose to reform Commission regulations that increase costs and slow broadband deployment.”³
7. I wholeheartedly support the ubiquitous deployment of affordable broadband Internet access at reasonable speeds by ILECs, cable companies, municipalities, cooperatives, and other broadband Internet providers. However, the FCC does not explain how existing consumer protection safeguards provided under existing rules impede such deployment. Moreover, many of the FCC’s proposals would

² *In the Matter of Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment*, WC Docket No. 17-84, Notice of Proposed Rulemaking, Notice of Inquiry, and Request for Comment, FCC Rcd 3266, (rel. Apr. 21, 2017) (“NPRM,” “NOI,” and “RFC” as applicable).

³ NPRM, ¶ 2.

jeopardize consumers' access to reliable, adequate, and safe telephone service, and inappropriately pre-empt state oversight.

8. In brief, as I discuss in more detail later in my declaration, the proposals put forth in the NPRM and NOI, if adopted, would eliminate important federal and state consumer safeguards, thereby jeopardizing the continuity and quality of service offered to consumers over ILECs' copper networks and the achievement of universal service. From abbreviated notice requirements for copper retirement to blanket presumptions about the discontinuance of service, the various proposals that the FCC is considering would make it harder for consumers to make a smooth and informed adjustment to the introduction of IP-based services. Given recent experience in the states, I am particularly concerned about the possibility that the FCC would drop from its definition of copper retirement the "de facto" retirement that occurs when an ILEC fails to maintain its copper plant in good working order.
9. In its *2015 Tech Transitions Order*,⁴ the FCC expanded the definition of copper retirement to add, among other things, "the failure to maintain copper loops, subloops, or the feeder portion of such loops or subloops that is the functional equivalent of removal or disabling —i.e., *de facto* retirement."⁵ As I demonstrate, this is a critically important regulatory tool to ensure that consumers

⁴ *In the Matter of Technology Transitions; Policies and Rules Governing Retirement Of Copper Loops by Incumbent Local Exchange Carriers; Special Access for Price Cap Local Exchange Carriers; AT&T Corporation Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services*, GN Docket No. 13-5, RM-11358, WC Docket No. 05-25, RM-10593, Report and Order, Order on Reconsideration, and Further Notice of Proposed Rulemaking ("*2015 Tech Transitions Order*"), 30 FCC Rcd 9372.

⁵ 47 CFR § 51.332(a).

receive adequate and reliable voice service during industry's technology transition. Although in the instant NPRM, the FCC states that "[m]aintenance of existing copper facilities remains a concern when an incumbent LEC does not go through the copper retirement process,"⁶ if the express description of a "de facto" retirement is dropped from the Commission's rules, it is not clear how or whether federal notice requirements would continue to apply. As I show, however, because ILECs are already failing to give notice in cases involving "de facto" copper retirement, notwithstanding the existing mandate of the Commission's rules, this situation would only be exacerbated by a revision in which "de facto" retirement is not specifically defined.

10. When consumers confront service deterioration due to insufficient maintenance and investment in the facilities over which that service is provided, they often turn to state PUCs for redress. Some states also maintain ongoing service quality reporting, using benchmarks, to support the objectives of public safety and protect consumer interests. Yet, in its NOI, the FCC raises the possibility of pre-empting precisely these state oversight functions. Citing various state laws that "require utilities or specific carriers to maintain adequate equipment and facilities,"⁷ and other state laws that "empower public utilities commissions, either acting on their own authority or in response to a complaint, to require utilities or specific carriers to maintain, repair, or improve facilities or equipment or to have in place a written

⁶ NPRM, ¶ 60.

⁷ NOI, ¶ 113, citing Ark. Code Ann. § 23-3-113; Cal. Pub. Utils. Code § 451; Colo. Rev. Stat. Ann. § 40-3-101(2); Idaho Code § 40-3-101; Ill. Compiled Stat. Ann. § 5/8-101; Ind. Code Ann. § 8-1-2-4; N.D. Century Code Ann. § 49-04-01; N.J. Stat. Ann. § 48:2-23; 66 Pa. Cons. Stat. Ann. § 1501; 27 L.P.R. Ann. § 1201; Utah Code Ann. 1953 § 54-3-1.

preventative maintenance program,”⁸ the FCC seeks comment on (1) “the impact of state legacy service quality and copper facilities maintenance regulations” and (2) “the impact of state laws restricting the retirement of copper facilities.”⁹ The FCC questions whether ILECs and other carriers are less “likely to deploy fiber in states that continue to impose service quality and facilities maintenance requirements than in those states that have chosen to deregulate.”¹⁰ I am unaware of any evidence to support this speculation and elaborate on this point in my declaration.

11. In this declaration I draw on my experience participating in state and federal regulatory proceedings. I demonstrate the importance of continuing federal and state oversight of ILECs’ service quality and copper network maintenance, including de facto retirement of copper without appropriate advance notice to consumers.
12. Among the many state regulatory proceedings, specifically focused on service quality and network transition issues, in which I have participated recently are the following:¹¹

- On January 13, 2017, I submitted an affidavit to the Maryland Public Service Commission on behalf of the Maryland Office of People’s Counsel Regarding Verizon Maryland’s Maintenance and Repair of Its

⁸ NOI, ¶ 113, citing Ark. Admin. Code § 126.03.9-8.01; Ky. Admin. Regs. 5:061 § 23; Miss. Admin. Code § 39-1-2:4; N.C. Gen. Stat. Ann. § 62-42; 807.

⁹ NPRM, ¶ 113.

¹⁰ Id.

¹¹ Appendix A to my declaration includes numerous other proceedings in which I participated that addressed service quality and network conditions.

Copper-Based Services In Both Fiber and Non-Fiber Areas of Maryland,
(the matter is pending review by the Maryland Public Service
Commission).

- On March 24, 2017, I submitted testimony to the New York Public Service Commission on behalf of the Communications Workers of America: Proceeding on Motion of the Commission to Consider the Adequacy of Verizon New York Inc.'s Retail Service Quality Processes and Programs, NYPSC Case 16-C-0122.¹²
- On February 17, 2017 and April 21, 2017, I sponsored testimony on behalf of the Iowa Office of Consumer Advocate in Iowa Utilities Board Docket No. INU-2016-0001 (In re: Deregulation of Local Exchange Service).

The matter is pending review by the Iowa Utilities Board.

13. I have also examined service quality data and policy in various proceedings as part of my analysis of alternative forms of regulation and as part of my analysis of numerous change-of-control proceedings (including, among others, the change in control in New Hampshire from Verizon to FairPoint; in several states, the change of control from Verizon to Frontier; and, most recently, the change of control from Verizon to Frontier in California). My testimony in California, submitted to the California Public Utility Commission in 2015, was on behalf of TURN.¹³ In

¹² Case 16-C-0122, Order Initiating Proceeding to Review Verizon New York Inc.'s Service Quality (issued and effective March 21, 2016) ("New York Order Initiating Proceeding").

¹³ In the Matter of the Joint Application of Frontier Communications Corporation, Frontier Communications of America, Inc. (U 5429 C), Verizon California Inc. (U 1002 C), Verizon Long Distance, LLC (U 5732), and Newco West Holdings LLC for Approval of Transfer of Control Over Verizon California Inc. and Related Approval of Transfer of Assets and Certifications (Filed March 18, 2015), Application 15-03-005, reply and supplemental testimony of Susan M. Baldwin on behalf of the Utility Reform Network (TURN), July 28, 2015 and September 11, 2015.

2014, I analyzed Verizon service quality in Pennsylvania on behalf of the Communications Workers of America.¹⁴

14. NASUCA members have also alerted me to additional proceedings in which states investigated concerns regarding ILECs' network maintenance and service quality. I discuss two proceedings in this declaration:
 - New Jersey I/M/O Verizon New Jersey Inc.'s Discontinuance of Land Line Telecommunications Maintenance, Facilities and Infrastructure (BPU Docket No. TO15121325) (order issued May 31, 2017); and
 - Neil and Gilda Altman v. Verizon Pennsylvania LLC, Pennsylvania Public Utility Commission ("Pa. PUC") Docket No. C-2015-2515583, Opinion and Order, (order entered November 18, 2016).
15. These proceedings collectively illustrate the importance of continuing federal and state oversight of ILECs' maintenance of their copper networks and the quality of their copper-based service.
16. The purposes of my declaration are to: (1) demonstrate state regulators' critically important role in ensuring that consumers have access to reliable voice service and that consumers' transition to new platforms for ILECs' provision of voice services entails continuing access to functionally adequate voice service; (2) draw from my first-hand experience analyzing information about the condition of ILEC networks, ILECs' service quality performance, and the economic incentives

¹⁴ Joint Petition of Verizon Pennsylvania LLC And Verizon North LLC for Competitive Classification of all Retail Services in Certain Geographic Areas and for a Waiver of Regulations for Competitive Services, Pennsylvania Public Utility Commission P-2014-2446303 and P-2014-2446304, Order entered March 4, 2015, Final Implementation Order entered September 11, 2015 (collectively, "Pennsylvania PUC Competition Orders").

confronting ILECs during their transition to IP networks as a way to illustrate the importance of ongoing federal and state oversight of ILECs' network practices; and (3) underscore the way that these economic incentives that ILECs confront in today's local markets create the potential for harm to consumers, which state regulators should continue to address.

17. Overall, based on my experience, I attest to the unique and significant value that state PUCs contribute to achieving the goal of ensuring that consumers, especially residential and small business customers, have access to reliable dial tone service, regardless of the technology that ILECs use to provide such service. Based on my wide-ranging experience, I believe that, along with a robust federal oversight process, it is vital to preserve the state role in overseeing the adequacy of service quality and protecting consumers from adverse impacts arising from the impairment or outright discontinuance of intrastate services. Moreover, based on my participation in many state and federal regulatory proceedings in which broadband deployment has been analyzed, I am unaware of instances where state oversight of telecommunications service quality has been a barrier to infrastructure investment.

II. STATE PUCS' ROLE IN ENSURING ADEQUATE RELIABLE SERVICE

Overview

18. Contrary to the implications of the FCC's discussion of state oversight of ILECs' copper networks,¹⁵ dual federal-state oversight of ILECs' network practices and service quality continues to be essential to ensure that consumers have reliable adequate and safe phone service.¹⁶ Consumers have historically been able to seek relief from state public utility commissions when encountering problems with the quality of their ILECs' phone service. These problems persist as is evidenced by the many state proceedings that investigated and are continuing to investigate service quality and network maintenance issues.
19. State PUCs possess regulatory tools that the FCC either lacks or has decided to forbear from using. State PUCs, when confronted with concerns expressed by municipalities and by consumers, can deploy the regulatory tools of comprehensive evidentiary hearings, which allow for detailed discovery and are open to participation by stakeholders. Also, many PUCs review ILECs'

¹⁵ NOI, ¶ 113.

¹⁶ The National Association of Regulatory Utility Commissioners ("NARUC") passed several resolutions that concern the technology transition as well as states' role as partners with the FCC in protecting consumers during the transition. See, e.g., "*Resolution in Support of IP Technology Transitions Which Preserve the Fundamental Features of Legacy Services*," February 17, 2016. "*Resolution Urging the FCC to Partner with States to Protect Residential and Business Consumers During the Technology Transition*," February 18, 2015, <http://pubs.naruc.org/pub/53A0DDA8-2354-D714-5199-4DC80B8792FE>. Also see NASUCA Resolution 2017-04, "*Urging Local, State, and Federal Offices to Ensure Reliable Broadband Internet Access Services Are Accessible and Affordable to All Consumers*." <http://nasuca.org/nwp/wp-content/uploads/2017/01/2017-04-NASUCA-Broadband-Resolution.pdf>

performance relative to PUC-established service quality benchmarks by requiring ILECs to submit regular service quality reports.¹⁷

20. PUCs are also acquainted with the status of competition in different geographic markets and can assess the extent to which competition is disciplining the quality of service that ILECs offer.¹⁸
21. Consumers are accustomed to calling state PUCs for assistance with service quality issues. Telephone bills typically include the phone number of the consumer division of the PUC so that customers who have not been satisfied with the way that ILECs have handled consumer complaints can turn to a neutral third party to seek relief. State PUCs are on the front line and have a history of engaging directly to resolve issues that surface regarding ILECs' service quality.
22. State regulatory oversight creates an essential level of accountability by ILECs that would otherwise be absent. Moreover, state oversight enables PUCs to apply administrative expertise to the objective of balancing the concerns of ILECs and consumers. On their own, consumers lack the negotiating clout necessary to ensure that ILECs offer reliable and adequate service and that ILECs provide

¹⁷ In 2008, despite the concerns raised by NASUCA and others, the FCC allowed ILECs to discontinue submitting service quality data to the FCC through the Automated Reporting Information System ("ARMIS") and so lacks data about the timeliness of ILECs' repair of dial tone lines and the numbers of troubles that customers report about dial tone lines. In the *ARMIS Forbearance Order*, the Commission decided to forbear from the rules requiring that carriers file ARMIS Reports 43-05 and 43-06, provided that the carriers committed to file the data voluntarily for 24 months after September 6, 2008. Since then, ILECs' accountability to state regulators for the quality of service that they provide to consumers has taken on heightened importance.

¹⁸ For example, the Pennsylvania PUC analyzed data regarding the availability of competitive alternatives for basic local exchange service at the wire center level. The Pennsylvania PUC did grant Verizon authority to detariff rates for basic local service in certain wire centers that met state standards for competitive classification. See, *Pennsylvania PUC Competition Orders*.

adequate notice of their plans to migrate to new platforms.¹⁹ Consumers living in rural areas often lack reasonably comparable substitutes for their landline services and consumers in more densely populated communities typically are served by a duopoly consisting of the incumbent telephone company and the cable company that has been awarded the franchise to serve the area.

23. This section of my declaration provides examples of the invaluable role of state oversight of the quality of service offered over ILECs' copper networks and of ILECs' maintenance of and investment in copper networks. My discussion is intended to be illustrative, and does not purport to represent all state proceedings that have addressed service quality and network transition matters in recent years. I discuss a few representative proceedings in this section to demonstrate the importance of the ongoing role of state PUCs in ensuring that consumers have access to reliable dial-tone lines, and that consumers are adequately prepared for ILECs' transitions to new technologies.

¹⁹ I am well aware that ILECs often contend that those consumers who are unhappy with the quality of their service can "vote with their feet" and abandon the ILEC. I also am well aware that approximately half of the nation's households have chosen to "cut the cord" and rely on wireless exclusively for their voice service. National Health Interview Survey Early Release Program, "Wireless Substitution: Early Release of Estimates from the National Health Interview Survey, July - December 2016," Stephen J. Blumberg, Ph.D., and Julian V. Luke, Division of Health Interview Statistics, National Center for Health Statistics, released May 4, 2017, at 1. <https://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201705.pdf>. On the other hand, approximately three out of four households with members aged 65 and over continue to rely on wireline service. *Id.*, at 2. Also, older consumers disproportionately rely on ILEC-provided wireline service (because they are disproportionately less likely to subscribe to broadband Internet access and therefore disproportionately less likely to avail themselves of cable-company-provided voice service). Whereas 77% of those aged 18 to 29 have broadband at home, only 51% of those aged 65 and older have broadband at home. Pew Research Center, Internet & Technology, "Internet/Broadband Fact Sheet," January 12, 2017. <http://www.pewinternet.org/fact-sheet/internet-broadband/>. More important, until such time as state and federal regulators have specifically authorized an ILEC to discontinue service, consumers should be able to obtain reliable, adequate and safe service from ILECs.

Verizon stopped investing in fiber long before the 2015 Technology Transition, and factors other than regulatory barriers appear to have driven its decisions.

24. I have participated in many state proceedings that have encompassed the investigation of service quality and ILECs' broadband deployment plans. I am unaware of any evidence to suggest that state oversight of ILECs' copper networks has hindered ILECs' ability or incentives to transition to new networks. Rather, the evidence squarely suggests that the economic criteria applicable to traditional business decisions are what drive the broadband investment associated with IP networks. While I understand that regulation is not cost-free for ILECs, the direct cost of deployment as well as the ILECs' assessment of revenue opportunities is what drives these decisions.
25. Certainly, Verizon stopped investing in fiber long before the FCC issued its 2015 Technology Transition rules. In March 2010, Verizon announced its intention to stop rolling out fiber to areas other than where it had prior commitments and business plans.²⁰ Indeed, in testimony before the California PUC related to the sale of Verizon's ILEC operations to Frontier Communications, a Verizon witness "testified [that] it was the company's intention from the beginning to limit FIOS distribution to those areas where it could be profitably deployed."²¹

²⁰ "Verizon to End Rollout of FiOS," The Wall Street Journal, March 30, 2010. In hearings held in the Verizon-Frontier proceeding in August 2015, Verizon reiterated that it has no plans to continue FiOS rollout in California. Mr. McCallion, the West Region President for Verizon, stated that Verizon is no longer deploying FiOS. CPUC Verizon-Frontier Proceeding, Transcript from Workshop No. 10, Long Beach, August 10, 2015, p. 464, ll. 2-9. In April 2016, Verizon announced plans to roll out fiber in Boston, and eight months later began a \$300 million FiOS deployment in the Boston area. The roll-out is anticipated to take six years. <https://www.theverge.com/2016/12/7/13869280/verizon-fios-rollout-boston-300-million>.

²¹ California Public Utilities Commission, In the Matter of the Joint Application of Frontier Communications Corporation, Frontier Communications of America, Inc. (U5429C), Verizon California, Inc. (U1002C), Verizon Long Distance LLC (U5732C), and Newco West Holdings LLC for Approval of Transfer of Control Over Verizon California, Inc. and Related Approval of Transfer of Assets and

26. Even in locations where Verizon made a binding commitment to deploy FiOS, it did not always follow through. The New York City mayor's office conducted an audit of Verizon's FiOS deployment relative to commitments Verizon made under a 2008 franchise agreement and issued a report with detailed findings.²²
27. Among other things, the audit determined that Verizon claimed households as "passed" with fiber optic cable before the necessary fiber connections to the block containing those households were actually made; that Verizon systematically refused to accept orders for residential service, not only before it had "passed" a household but even well after it claimed it had passed a household; Verizon systemically failed to meet its six-month and 12-month deadlines to fill non-standard installation orders for service to residential buildings; and Verizon broadly provided the public with misleading information with regard to Verizon's obligations.²³

Certifications, Application 15-03-005 (Filed March 18, 2015), *Decision Granting Application Subject to Conditions and Approving Related Settlements*, Decision 15-12-005, December 3, 2015 ("CPUC Order Approving Verizon Frontier Transaction"), at 52, footnote omitted.

²² Verizon FiOS Implementation Final Audit Report, June 18, 2015, NYC Information Technology & Telecommunications, Bill de Blasio, Mayor Anne Roest, Commissioner, Final Audit Report – Verizon New York ("NYC FiOS Audit Report"). As described in the report: "The objective of the auditors of the Department of Information Technology and Telecommunications (DoITT) was to determine whether Verizon New York complied with the build-out requirements in Section 5 and other pertinent provisions of its 2008 cable television franchise agreement. The audit gave particular attention to the following requirements, which are subject to exceptions and limitations specified in the franchise agreement:

- Sections 5.1 and 5.4, which require Verizon to pass all residential households in the City with fiber optic cable by June 30, 2014; and
- Section 5.4.2, which requires Verizon to complete non-standard installations within twelve months after requests for such installations are received."

NYC FiOS Audit Report, at 1.

²³ *Id.*, at 3.

28. Elsewhere where Verizon assumed a legal obligation to provide ubiquitous fiber service, it did not always deploy fiber in a manner that permitted it to “stand ready” to offer fiber-based services to all customer locations.²⁴
29. Moreover, rather than deploying fiber to its “non-FiOS” areas, Verizon Communications steadily sold off properties to other companies (Hawaii in 2005; Maine, New Hampshire, and Vermont to FairPoint in 2009; operations and assets in fourteen states (including some of California) to Frontier in 2010). Most recently, Verizon Communications sold the rest of its wireline operations in California, and in Florida and Texas to Frontier Communications.²⁵ There is no indication that Verizon’s decision to exit these service territories and avoid upgrading to broadband arose from concern over regulatory barriers as opposed to an economic decision by the ILEC about the costs and revenues (current and projected) of serving these areas. In California, Frontier Communications made it clear that it had no plans to expand FiOS beyond the initial footprint set by Verizon,²⁶ and it has shown no inclination to revise these plans.

²⁴ On October 1, 2015, the mayors of 14 major east coast cities sent a letter to Verizon CEO Lowell McAdams. The letter asserted that in the cases of New York City, Pittsburgh, Jersey City and Newark, “Verizon has failed to meet contractual or legislative deadlines to make fiber optic cable service to many of our residents. ... In other cases, such as Syracuse, Worcester, Lowell, and Albany, Verizon has simply refused to build FiOS at all.”

²⁵ “Frontier Communications to Acquire Verizon Wireline Operations in California, Florida and Texas Increasing Scale and Driving Shareholder Value,” Investor Presentation, at 4.

²⁶ Melinda White, Area President of Frontier’s West Region, stated that Frontier has no plans to extend FiOS service. CPUC Verizon-Frontier Proceeding, Transcript Workshop 10, Long Beach, August 10, 2015, p. 476, ll. 1-2. See also CPUC Order Approving Verizon Frontier Transaction, at 50, stating: “For its part, Frontier promised to increase significantly the number of local service personnel, to upgrade the network through the use of Connect America funding from the FCC and its own resources, and to focus without distraction on maintaining and operating a wireline network (including broadband) without concerns about the relationship between that network and a sister wireless network.”

30. I participated fully in the CPUC's investigation of Frontier's proposed acquisition of Verizon's operations, and, among other things, scrutinized in detail Frontier's plans for increasing broadband deployment and broadband speeds, specifically because expanded broadband deployment was one of the transaction-related promises that Frontier made to the CPUC. I reviewed extensive discovery and testimony on this issue and did not encounter **any** evidence to suggest that the CPUC's oversight of copper networks and service quality were factors affecting Frontier's decisions regarding the deployment of new technology. Instead, business case decisions – the expected revenues associated with such deployment balanced with the cost of such deployment -- were the overriding factors in Frontier's broadband deployment plans. Frontier asserted that it intended to deploy technicians to methodically identify and implement field repairs in the copper network that it was acquiring, but did not suggest that such efforts impeded any possible roll-out of broadband platforms.²⁷ Instead, Frontier explained that its investment in its copper network would enable it to offer DSL in places where it could not otherwise do so.²⁸

²⁷ CPUC Verizon-Frontier Proceeding, Rebuttal Testimony of Melinda White, Area President of Frontier's West Region, August 24, 2015, at 4, 16. See also, *id.*, at 17-18 where Ms. White indicates Frontier's intention to deal with network issues. See also Rebuttal Testimony of Michael Golob, Senior Vice President of Network & Engineering Integration, Frontier, August 24, 2015, at 4-5, 19-20.

²⁸ Frontier's broadband plans, as described to the CPUC, included enhancements to its copper network, which underscores the role of copper networks in ILECs' broadband deployment plans. Frontier stated that it "plans to use the latest technology available including ADSL2+bonding, VDSL and VDSL Bonding, and ROADM transport for backhaul to complete this expansion." Baldwin Direct Testimony, CPUC Verizon-Frontier Proceeding, July 28, 2015, at 98, quoting Frontier response to TURN 4.10, included as Exhibit SMB-29 in Baldwin Direct Testimony.

California

31. The oversight by the CPUC of the level of service quality ILECs offer and the condition of their copper networks provides an important recourse for consumers experiencing problems with out-of-service dial tone lines and slow repair of service, problems that affect the reliability and safety of telephone service. For example, as part of the recent comprehensive investigation of Verizon's sale of its operations to Frontier, the CPUC conducted eleven local public hearings to afford consumers an opportunity to address service quality. In these hearings, consumers raised concerns that underscored problems with the condition of the copper network (then owned by Verizon) and that highlighted how the lack of adequate broadband Internet access was affecting those on the wrong side of the digital divide. At no point in these proceedings did Verizon or Frontier argue or provide evidence that service quality regulation was a factor in their past or future broadband deployment decisions.
32. The CPUC affirmatively seeks to promote the deployment of advanced services through modernization of telecommunications infrastructure. At the same time, it maintains the necessary oversight to ensure that ILECs: maintain a safe and reliable network;²⁹ make available to all customers basic service that satisfies functionality specified by the CPUC;³⁰ meet CPUC-established standards for

²⁹ P.U. Code Section 451. See also, General Order 133-C, Rules Governing Telecommunications Services (effective 7/8/09) ("California Service Quality Rules"). See also, D. 15-08-041, Order Affirming Network Study.

³⁰ D.12-12-038, "Decision Adopting Basic Telephone Service Revisions" (issued 12/24/12).

quality of service;³¹ and provide customer service and consumer education.³²

Each of these obligations potentially affects ILECs' decisions regarding deployment of new technology, yet there is no evidence that any of them are impeding ILECs' infrastructure investment in California, decisions, which are, again, based on the balancing of expected revenues, costs, and operational savings associated with such investment.

33. Preventing the degradation of basic service and ensuring network reliability are ongoing and unambiguous regulatory objectives in California, and ones that FCC rules should not undermine. The CPUC also plays an important role in consumer education about the impact of new technology on consumers. For example, with respect to FiOS Voice and other VoIP services, the CPUC takes steps to ensure that consumers are aware of the risks associated with losing power when they elect such service in place of TDM-based wireline service.³³ There is little to be gained and much to be lost by the pre-emption of such state oversight.

Iowa

34. The role of the Iowa Utilities Board ("IUB") has been and continues to be important to address the concerns that consumers raise about service quality. For example, recently the IUB addressed CenturyLink's performance relative to IUB-

³¹ California Service Quality Rules. See also, D.15-08-041, Order Affirming Network Study.

³² See, e.g., P.U. Code Sections 709 (h), 2896.

³³ Rulemaking 07-04-015, Order Instituting Rulemaking on the Commission's Own Motion into Reliability Standards for Telecommunications Emergency Backup Power Systems and Emergency Notification Systems Pursuant to Assembly Bill 2393 (filed April 12, 2007), D. 10-01-026, "Decision Adopting Guidelines for Customer Education Programs Regarding Backup Power Systems Pursuant to Assembly Bill 2393" (issued 1/22/2010).

established service quality metrics, and, based on that review, in October 2016, the IUB found rule violations by CenturyLink. Among other things, the IUB directed CenturyLink to provide assurance about how it would prevent similar service problems in the future.³⁴

35. The IUB has also recently reviewed service quality complaints filed by customers of another ILEC serving Iowa customers, specifically of Windstream Iowa Communications, Inc.'s ("Windstream"). As described by the Iowa Office of Consumer Advocate ("OCA"): "The nature of the complaints regard delays in restoring service of more than a week, sometimes up to 25 days. Similar to customer concerns in Docket No. FCU-2015-0008, Windstream customers noted concerns of no reliable cellular service, the need to call out in case of an emergency, and some complainants noted the negative impact delayed repairs had on their small businesses."³⁵
36. On another service quality topic, the Iowa OCA has urged, "While progress has been made regarding rural call completion service quality, the ability of the Board to address and continue to regulate service quality is critical for Iowa customers and should be continued."³⁶
37. The IUB is presently investigating whether it should retain oversight of ILECs' service quality, and, if so, the level of such oversight that would be appropriate.³⁷

On behalf of the Iowa OCA, I testified that, based on today's market conditions,

³⁴ *Office of Consumer Advocate v. CenturyLink Communications, LLC*, Docket Nos. FCU-2015-0008, et al., "Order Finding Violations, Requiring Response, and Granting Waiver," October 12, 2016.

³⁵ Direct Testimony of Sheila J. Parker, Office of Consumer Advocate, In Re: Deregulation of Local Exchange Services, Docket No. INU-2016-0001, February 17, 2017 ("Parker Testimony") at 7.

³⁶ *Id.*

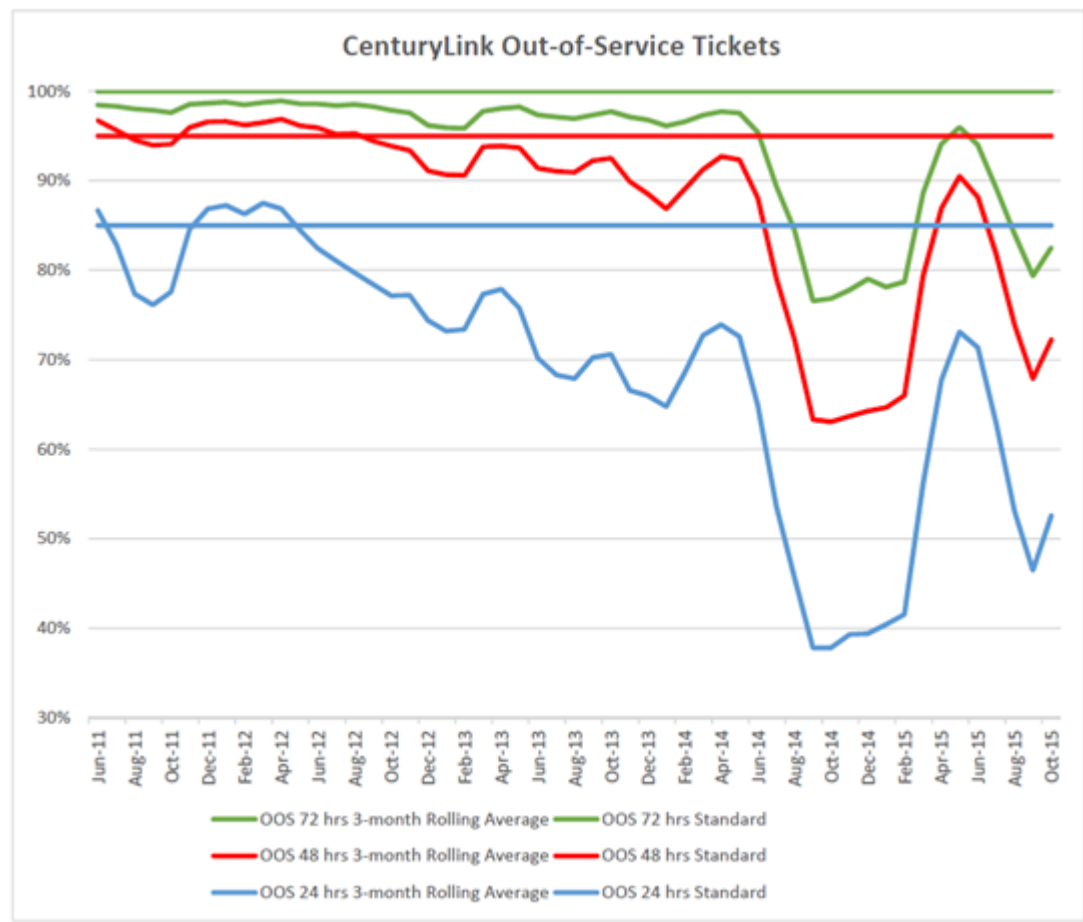
³⁷ In re: Deregulation of Local Exchange Service, Iowa Utilities Board Docket No. INU-2016-0001.

such oversight should continue.³⁸ Regardless of the outcome of the Board's deliberations, this proceeding underscores the fact that states are well-positioned to provide service quality oversight and also to determine if and where sufficient competition exists to warrant any relaxation of this oversight.

38. Figure 1 shows, for the indicated four-year period, the percentage of out-of-service trouble tickets cleared by CenturyLink within 24, 48 and 72 hours, along with the corresponding 85%, 95% and 100% standards prescribed in the rules at the time. The declining pattern is unmistakable.

³⁸ In re: Deregulation of Local Exchange Service, Iowa Utilities Board Docket No. INU-2016-0001, direct and responsive testimony on behalf of Office of Consumer Advocate, February 17, 2017 and April 21, 2017.
<https://efs.iowa.gov/efs/SearchDocumentSearch.do?searchType=document&sortColumn=xDateFiled&sortBy=Desc&numOfResults=25&docketNumber=INU-2016-0001>

Figure 1



39. Moreover, oversight of copper-based service is particularly important in Iowa, where, in contrast with the national average of 15% of residential wirelines being offered by ILECs' VoIP service, in Iowa, none of the residential ILEC wirelines are offered over the IP platform.³⁹
40. States exercise important oversight to ensure that regardless of the platform that is used, consumers have adequate and reliable service. As is the case with other

³⁹ Voice Telephone Services: Status as of June 30, 2016, FCC Industry Analysis and Technology Division, Wireline Competition Bureau, April 2017 ("FCC Voice Report"), Figure 2. Supplemental Table 1, Voice Subscriptions (in Thousands) – Iowa.

proceedings in which I have been involved, I am unaware of evidence suggesting that the IUB's oversight has driven ILECs' investment decisions.

Maryland

41. More than 1,200 complaints were filed by consumers with various government agencies in Maryland, primarily with the Maryland Public Service Commission, between 2011 and 2016 regarding the quality of Verizon Maryland's dial tone service and also its practices relating to its migration to fiber-based service.⁴⁰ I examined these complaints to assess how Verizon's practices relating to service quality linked to network maintenance and repair are experienced by its Maryland customers. As part of my review, I also examined consumers' complaints pertaining to how Verizon is handling copper retirement and migration to fiber-based services, including FiOS.⁴¹
42. My detailed analysis of consumer complaints in Maryland pointed to the need for state regulatory focus on the following areas:

- *Service quality in both fiber and non-fiber communities:*
 - In those parts of the state where Verizon has not deployed fiber/FiOS® (and has no plans to do so), the concern is that Verizon is failing to adequately maintain its copper network and

⁴⁰ Complaints were also filed with the Attorney General's Office of Maryland and local government agencies such as the Howard County Office of Cable Administration, Montgomery County Office of Consumer Protection, and Montgomery County Office of Cable and Broadband Services.

⁴¹ My affidavit is available online at the Maryland PSC website attached as Exhibit A to the *OPC Petition for an Investigation into Verizon's BLS* as Mail Log No. ML # 202479 <http://www.psc.state.md.us/>

will at best implement short-term solutions for deteriorating outside plant.

- In those parts of the state where Verizon has deployed fiber and intends to migrate customers from copper to fiber (as the FCC's rules permit it do so), the concerns that consumer complaints raise are that Verizon Maryland is letting its copper network deteriorate in the meantime (i.e. a *de facto* retirement), thus providing gaps in service during the transition.
 - *Unauthorized copper retirement:* In those parts of the state where Verizon has deployed fiber and intends to migrate customers from copper to fiber (as the FCC's rules permit), but has not yet filed notice with the FCC of its intent to do so, the consumer complaints raise the concern that Verizon's unauthorized migration of customers to its fiber network violates FCC rules on community retirement.
 - *Unauthorized discontinuance of regulated TDM-based voice service or promotion of unregulated voice service.* Some consumer complaints raise the concern that Verizon Maryland has migrated some customers to its unregulated FiOS voice service without their full knowledge or consent, or has pressured them to adopt that service without a clear explanation of the distinction between regulated and unregulated service.
43. The obligation and authority to look out for consumers' interests with respect to service quality and reliable access to basic voice service are squarely within the Maryland PSC's regulatory mandate. Verizon is subject to an alternative

regulation plan, which under Maryland law is required to “(1) protect consumers by, at minimum”

- (i) producing affordable and reasonably priced basic local exchange service, as defined by the [Maryland] Commission; and
- (ii) ensuring the quality, availability, and reliability of telecommunications services throughout the State.⁴²

Consistent with this mandate, the Maryland PSC has focused on service quality issues in connection with recent revisions to the alternative form of regulation.⁴³

44. A PSC Staff report has also recognized that the discontinuance of basic local exchange service (“BLS”), along with access to E911, continues to require regulatory oversight.⁴⁴ Verizon Maryland is the main provider of basic local exchange service throughout Maryland. Its service territory includes areas along the I-95 corridor where Verizon has deployed a fiber network, such as Anne Arundel County, Baltimore County, Howard County and Montgomery County. But Verizon also serves significant portions of Maryland in which it has not deployed fiber and that rely solely on copper telephone networks, Baltimore City as well as especially rural areas in southern Maryland, the Eastern and Western

⁴² Maryland Utility Code § 4-301(b). In addition, the alternative regulation plan is required to encourage the development of competition and to be in the public interest. *Id.*

⁴³ See, e.g., Order 83137 issued in: Case No. 9072, *In The Matter of the Request of Verizon Maryland Inc. to Reclassify Certain Retail Bundled Services to the Competitive Services Basket As Provided By the Commission’s Price Cap Plan*, Case No. 9114, *In the Matter of Commission’s Investigation into Verizon Maryland, Inc.’s Service Performance and Service Quality Standards*, Case No. 9123, *In the Matter of Commission’s Inquiry into Verizon Maryland Inc.’s Provision of Local Exchange Telephone Service Over Fiber Optic Facilities*; Case No. 9133, *In the Matter of Appropriate Forms of Regulating Telephone Companies, et al; In Re Verizon Maryland Inc.*, 279 P.U.R.4th 504 (February 2, 2010) Mail Log 121510.

⁴⁴ “Retail Service Withdrawals Within the Telecommunications Industry of Maryland,” on behalf of the Staff of the Public Service Commission of Maryland, December 1, 2015 (filed with the PSC with a cover letter from Janice M. Flynn, Assistant Staff Counsel, PSC, dated November 30, 2015), Docket No. PC 39.

Shores of Chesapeake Bay, and western Maryland.. While the discontinuance of BLS has yet to become widespread in Maryland, issues of copper retirement and basic service maintenance are beginning to affect an increasing number of customers in Maryland and nationwide as Verizon continues to migrate customers onto its more lucrative fiber and wireless networks across the country. Dual federal-state oversight of this migration process is important to ensure that consumers are adequately and clearly informed in a timely manner.⁴⁵

45. My detailed analysis of consumer complaints and of the economic incentives confronting Verizon Maryland underscores the value of state oversight of ILECs' service quality and copper network maintenance.
46. Ongoing state oversight continues to be essential, as is further corroborated by the detailed analysis recently conducted by Maryland PSC Staff of Verizon Maryland's performance relative to service quality metrics, prepared in response to the OPC's petition for an investigation. Staff concluded that "Verizon's performance in certain metrics is deteriorating over time" and Staff recommended that the Maryland PSC "collect and monitor Verizon's service quality data for a period of at least 12 months to ensure Verizon's service quality does not degrade

⁴⁵ For example, in October, 2016, Maryland OPC petitioned both the FCC and Maryland PSC to suspend and investigate Verizon's copper retirement notices. (*Petition of Office of People's Counsel for an Investigation Into the Copper Retirement Notices Sent By Verizon, Maryland LLC* (ML # 202479 10/28/2016 Maryland PSC). *Opposition Comments of the Maryland Office of People's Counsel to the Copper Retirement Notices Sent by Verizon Maryland, LLC to Maryland Retail Customers Under Rule 51.332*, WC-16-351 FCC, filed 0/28/16. As a result, Verizon Maryland agreed to suspend its copper retirement notices and work with Staff and Maryland OPC to modify the timing and substance of its retail notices. This process reportedly worked to the satisfaction of the parties. As later observed by Maryland Public Service Commission Staff: "Staff has worked closely with Verizon and OPC to ensure that customers are receiving appropriate notice on network transformation." Comments of the Staff of the Maryland Public Service Commission, filed June 1, 2017 (ML # 215507), at 29.

past the requirements under Maryland Code of Regulations (‘COMAR’) and Alternative Form of Regulation (‘AFOR’) standards going forward.”⁴⁶

47. Staff raised concerns about several important aspects of Verizon Maryland’s service quality, determining that the timeliness of Verizon Maryland’s repair was declining, the repeat trouble rate was increasing, and the percentage of repair appointments missed was increasing.⁴⁷ Staff concluded that “[o]nce the necessary data is collected, the Commission should reexamine whether a formal investigation or proceeding is necessary.”⁴⁸
48. OPC’s and Staff’s detailed analyses of consumer complaints and service quality data demonstrate the unique level of familiarity with ILECs’ service quality and consumers’ experiences that assessments at the state level uniquely provide. The filing of the OPC’s Petition and the Staff Comments with the Maryland PSC help to hold Verizon Maryland accountable for providing reliable service to all of its customers.

New Jersey

49. Consumers and communities in New Jersey petitioned the New Jersey Board of Public Utilities (“Board”) regarding service quality. The Board concluded the proceeding last month by issuing an Order that resolved a long-standing investigation into the maintenance of Verizon New Jersey’s copper landline

⁴⁶ Comments of the Staff of the Maryland Public Service Commission, filed June 1, 2017 (ML # 215507) at 30. The Maryland PSC has not yet ruled on this matter.

⁴⁷ Id., at 20-25. Because Staff’s statistical analysis was conducted on a territory-wide average basis, the analysis did not address whether there are particular communities that are enduring particularly poor service quality.

⁴⁸ Id., at 31.

facilities. As described in the Board's Order, the County of Cumberland and various towns (seventeen towns in total) submitted a petition in November 2015 to the Board seeking "an order from the Board to investigate Verizon New Jersey's ('Verizon' or 'Company') alleged discontinuance of maintenance of copper landline facilities and infrastructure necessary for the continued provision of adequate landline telephone and data services to New Jersey customers who are without fiber optic service."⁴⁹ The Board Order describes the original petition as asserting "that Verizon has failed to comply with its obligations to maintain and repair its service to ensure that safe and proper landline telephone and data transmission are provided throughout New Jersey."⁵⁰

50. Under a stipulation agreed to by Verizon New Jersey, the Division of Rate Counsel, Cumberland County and the seventeen towns that originally submitted a petition to the Board regarding the adequacy of Verizon New Jersey's service, Verizon New Jersey has committed to specific copper maintenance measures, to meeting certain service quality metrics (concerning, among other things, timeliness of repair, and the network trouble report rate), to reporting on such items as the number of copper cables replaced and repaired, to fiber deployment in certain areas and providing relief for congestion on digital subscriber line service.⁵¹

⁴⁹ New Jersey I/M/O Verizon New Jersey Inc.'s Discontinuance of Land Line Telecommunications Maintenance, Facilities and Infrastructure (BPU Docket No. TO15121325), Order Approving Stipulation, dated May 31, 2017, effective June 10, 2017 ("New Jersey Order"), at 1, footnote omitted.

⁵⁰ Id.

⁵¹ Id., at 4-5.

51. Without state regulatory oversight, in my view, it is highly unlikely Verizon would have undertaken these steps. In its Order approving the Stipulation, the Board cites to its authority for such oversight, stating:

The Board is empowered to ensure that regulated public utilities provide safe, adequate and proper service to the citizens of New Jersey. N.J.S.A. 48:2-23. Pursuant to N.J.S.A. 48:2-13, the Board has been vested by the Legislature with the general supervision and regulation of and jurisdiction and control over all public utilities "so far as may be necessary for the purpose of carrying out the provisions of [Title 48]." The courts of this State have held that the grant of power by the Legislature to the Board is to be read broadly and that the provisions of the statute governing public utilities are to be construed liberally. See, *In re Woodbury Terrace Sewerage and Gas Company*, 35 N.J. 358, 371 (1961); *Twp. of Deptford v. Woodbury Terrace Sewerage Corp.*, 54 N.J. 418, 424 (1969), *Bergen County v. Dept. of Public Utilities*, 117 N.J. Super. 304 (App. Div. 1971).

52. The Stipulation recently approved by the New Jersey Board illustrates the importance of state regulatory oversight to ensure that consumers have reliable, efficient and safe service.

New York

53. A pending investigation by the New York Public Service Commission ("NYPSC") into the service quality processes and programs of Verizon New York ("Verizon NY") also demonstrates the unique role that state regulators have in ensuring that ILECs maintain their networks adequately.⁵² State PUCs have decades of experience conducting evidentiary investigations during which stakeholders can request detailed data and information, allowing for

⁵² Proceeding on Motion of the Commission to Consider the Adequacy of Verizon New York Inc.'s Retail Service Quality Processes and Programs, NYPSC Case 16-C-0122.

comprehensive fact-based assessments and balanced deliberations by regulators.

As is the case in Maryland, state regulators in New York have first-hand experience and knowledge of the communities that ILECs serve and the importance of well-maintained networks to the welfare of their local economies and citizens.

54. I submitted testimony on March 24, 2017, on behalf of the Communications Workers of America, based on my comprehensive analysis of detailed public and confidential information about the condition of Verizon NY's copper network and its performance relative to PUC-established service quality standards.⁵³ PSC Staff also submitted testimony, finding that, "based on data made available by Verizon, the Company's service quality for non-Core customers is not meeting the Commission's service quality standards, has not improved, and in some cases has gotten worse since the Commission implemented the SQIP [Service Quality Improvement Plan] in 2010."⁵⁴
55. Among other things, based on my detailed analysis, I concluded that the level of service quality varies so vastly in New York, depending on where a consumer lives, as to undermine the principle of universal service.⁵⁵

⁵³ Proceeding on Motion of the Commission to Consider the Adequacy of Verizon New York Inc.'s Retail Service Quality Processes and Programs, New York Public Service Commission Case 16-C-0122, direct testimony of Susan M. Baldwin on behalf of the Communications Workers of America, March 24, 2017 ("Baldwin New York Testimony").
<http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=16-c-0122&submit=Search+by+Case+Number>

⁵⁴ Proceeding on Motion of the Commission to Consider the Adequacy of Verizon New York Inc.'s Retail Service Quality Processes and Programs, NYPSC Case 16-C-0122, Testimony of Gary P. Hildenbrandt, Utility Engineer (Telecommunications) and Joseph P. Yakel, Utility Supervisor (Telecommunications), Department of Public Service, March 24, 2017, at 4-5.

⁵⁵ Baldwin New York Testimony, at 3.

56. I also analyzed key indicators of the condition of Verizon's outside plant, including (1) the frequency with which Verizon's transducers⁵⁶ are entirely non-operational and the frequency of transducers going into alarm mode (which signals problems with these facilities); (2) Verizon's replacement of batteries in remote terminals (which are necessary for Verizon to serve customers in remote communities); (3) the number of open orders for replacing or repairing defective cable; (4) the age of some of the components of Verizon's outside plant and related assets relative to their useful lives; and (5) Verizon's deployment of Voice Link service as a substitute for Verizon's traditional basic local exchange service. My detailed analysis of these five indicators pointed to a pattern of neglect that has left the network in substandard condition.⁵⁷
57. The NYPSC, relying on its statutory authority, is conducting an in-depth investigation of the condition of Verizon NY's network and of Verizon NY's performance relative to PSC-established service quality metrics. Moreover, the NYPSC has indicated that "if through the course of the process laid out below, the Commission determines that any action should be taken regarding Verizon's service quality, it may exercise its authority under PSL §98 to order any improvements that are deemed necessary."⁵⁸
58. The NYPSC's pending proceeding illustrates the unique role that state regulation offers, allowing for and encompassing the development of comprehensive

⁵⁶ Transducers measure air pressure in cables, which in turn indicates whether cables can sustain their integrity when exposed to moisture.

⁵⁷ Baldwin New York Testimony, at 4-5.

⁵⁸ Order Initiating Proceeding, at 11-12.

evidentiary records through discovery, testimony, and hearings which allow for informed decision-making based on the specifics of state markets.

59. Finally, I am unaware of any impediment to broadband deployment or to an IP platform that the state's investigation of Verizon NY's copper network and service quality has created. Verizon NY can continue to migrate its customers to fiber. As I stated in my testimony:

In places where Verizon has deployed fiber throughout the community, then it should be allowed to migrate customers to these new facilities, provided however that being served over fiber should not justify requiring the customer to switch to a voice service that is more expensive or has fewer regulatory protections. However, until Verizon has firmly committed to the deployment of fiber in an area, and until Verizon has completed its migration in those areas where it has deployed fiber, Verizon should not be permitted to allow existing copper facilities to deteriorate.

Fixed wireless service (Verizon's Voice Link service), on the other hand, is not sufficiently robust to serve as a safe and reliable alternative; thus, its deployment cannot replace the need for ongoing investment in the copper network.⁵⁹

Pennsylvania

60. Consumers in Pennsylvania have also sought relief from state regulators regarding the adequacy of their copper-based telephone service. A recent case before the Pennsylvania PUC provides useful insight into how state regulators carefully execute their statutory charge to ensure that "[e]very public utility shall furnish and maintain adequate, efficient, safe, and reasonable service and facilities, and shall make all such repairs, changes, alterations, substitutions,

⁵⁹ Baldwin New York Testimony, at 15-16.

extensions, and improvements in or to such service and facilities as shall be necessary or proper for the accommodation, convenience, and safety of its patrons, employees, and the public” and to ensure that “[s]uch service also shall be reasonably continuous and without unreasonable interruptions or delay.”⁶⁰ In November 2015, Verizon Pennsylvania customers Neil and Gilda Altman complained to the Pennsylvania PUC about an outage, service quality problems, and the ILEC’s notice of a planned copper to fiber transition.⁶¹ The first outage lasted five days in the winter, at the same time that the elderly Mr. Altman had a health crisis.⁶² The ILEC attributed the outage to a group outage due to wet copper wires.⁶³ Months later, the Altmans experienced static, buzzing, and other interference.⁶⁴ The Altmans were also troubled and confused by Verizon’s notices of the copper to fiber transition and potential for loss of service and their telephone number.⁶⁵ They filed a complaint, and ported their telephone service to another carrier as a precaution.⁶⁶ The PUC adjudicated the facts, hearing in detail from both the complainants and the ILEC, a careful examination unlikely to be feasible through exclusively federal oversight. Verizon Pennsylvania stated

⁶⁰ 66 Pa.C.S. § 1501.

⁶¹ Pennsylvania Public Utility Commission Docket No. C-2015-2515583, Neil and Gilda Altman v. Verizon Pennsylvania LLC, Opinion and Order, October 27, 2016, order entered November 18, 2016 (“Pennsylvania Order”); see also, Initial Decision of Administrative Law Judge Heep, July 25, 2016 (“Pennsylvania I.D.”).

⁶² Pennsylvania I.D. at 1-2, 4-5, 15-17.

⁶³ Id. at 2, 16.

⁶⁴ Id. at 7, 8, 17-18.

⁶⁵ Id. at 5-8, 18-20. When Verizon communicated its network transition plans to the Altmans in October and November 2015, the FCC’s 90 day notice requirement was not in effect.

⁶⁶ Id. at 19-20.

that it had revised and improved its notices of future copper to fiber transitions.⁶⁷

At the end, the Pennsylvania PUC accepted most of the key findings and recommendations from the Administrative Law Judge (“ALJ”) regarding Verizon Pennsylvania’s failure to provide adequate service.⁶⁸ The PUC held that the ILEC had provided inadequate service and failed to take substantial action to clear trouble on the consumers’ telephone line during the five day outage and also did not furnish facilities adequate to provide transmission of communications during a later period. The PUC sustained the consumers’ complaint that the ILEC’s messages about the copper to fiber change constituted unreasonable service. As a remedy, the PUC required the ILEC to offer the customers the service they had been previously subscribed to, at the rate they would have received at that time, and with their original telephone number.⁶⁹ The PUC also imposed a civil penalty on the ILEC.⁷⁰

61. State regulators are well-positioned to review evidence and issue balanced decisions regarding consumer complaints. In the case just described, the consumer complaint addressed the quality and continuity of their voice service over copper as well as Verizon Pennsylvania’s planned network transition. Ultimately, although the Pennsylvania PUC ordered the remedial actions described above, it did not require Verizon to restore the consumers’ copper line

⁶⁷ Id. at 25.

⁶⁸ Pennsylvania Order, at 1-5.

⁶⁹ Pennsylvania Order, 4.

⁷⁰ Id., at 2-3.

telephone service.⁷¹ The ALJ explained that Verizon Pennsylvania’s migration from copper to fiber “does not relieve Verizon of its duty to provide adequate, reliable service.”⁷² She also found that the information communicated to the customers relative to the transition of their service from copper to fiber was inadequate and unreasonably confusing.⁷³

62. While this is only one specific example, it illustrates how state PUCs are uniquely positioned and qualified to protect consumer interests, while still supporting a smooth transition to IP-based services.
63. In an earlier proceeding initiated by Verizon Pennsylvania LLC and Verizon North LLC, the Pennsylvania PUC granted authority to detariff rates for basic local exchange service in certain competitive wire centers. However, the Pennsylvania PUC affirmed that Verizon’s obligation to “furnish and maintain adequate, efficient, safe and reasonable services and facilities” under 66 Pa. C.S. Sec. 1501 continued to apply in all wire centers.⁷⁴ The PUC refused to waive the Pennsylvania line extension regulation, stating that the obligation to connect continued as part of Verizon’s COLR obligation.⁷⁵

⁷¹ Pennsylvania I.D., at 11-14.

⁷² Id., at 18.

⁷³ Id., at 19-20, 23. The ALJ determined that “[a]lthough technically, Verizon did not end the Altman’s service, the company did so essentially.” Id., at 19.

⁷⁴ See, Pennsylvania Competition Orders, March 4, 2015 Order at 86 (“Neither does a waiver of these Regulations impact the Commission’s ability to adjudicate a customer complaint alleging poor service quality. Verizon remains statutorily required to provide reasonable service in competitive areas. Granting Verizon’s waiver requests does not change this or the Commission’s ability to address a quality of service complaint”).

⁷⁵ See, Pennsylvania PUC Competition Orders, March 4, 2015 Order, at pages 7, 37-38, 60-61, 80-81. See also September 11, 2015 Order, at pages 23-25.

Functional Equivalency

64. There are clearly circumstances under which the replacement of facilities may lead to a discontinuance, reduction or impairment of service. Such was deemed to be the case when (in June 2013) Verizon Communications filed Section 214 applications proposing to abandon copper transmission facilities damaged during Superstorm Sandy and discontinue offering its TDM wireline services to residents of Fire Island in New York and in the Barrier Islands in New Jersey, replacing them with a fixed wireless voice service, known as “Voice Link.”⁷⁶ Whereas Voice Link has been an optional offering in some other Verizon Communications locations, the proposal for Fire Island was that the service **replace** the existing copper-based service.
65. After Verizon Communications filed its Section 214 application at the FCC and a proposed tariff with the New York Public Service Commission, consumers began to understand the limitations of the Voice Link service as compared with their pre-existing copper service. In addition to not working during a power outage, the proposed fixed wireless Voice Link service would not support credit card point-of-sale transactions, medical monitoring devices, and alarm systems, as

⁷⁶ Application of Verizon New York and Verizon New Jersey to Discontinue Telecommunications Service, WC Docket No. 13-150 and Comp File No. 1115, FCC Public Notice DA 13-1475, “Comments Invited on Application of Verizon New Jersey Inc. and Verizon New York Inc. to Discontinue Domestic Telecommunications Services,” June 28, 2013. The most recent entries in this docket on the FCC’s EDOCS electronic docket system are 2 protective orders; on August 14, 2013, the Commission issued a Public Notice indicating that the requested authority would not be (DA 13-1758).

well as the data service known as digital subscriber line (“DSL”) service.⁷⁷ In its Section 214 Application, Verizon Communications noted that it would refer data service (i.e., DSL) customers “to a Verizon Wireless specialist for 4G LTE broadband services.”⁷⁸

66. Households, small businesses, first responders, and municipalities spoke up against Verizon Communications’ unilateral decision to roll out Voice Link rather than to repair its damaged outside plant. I was directly involved in analyzing the impact of Verizon’s Voice Link proposal on consumers in New York, and it is my understanding that the reactions by affected customers in New Jersey was very similar. The opposition was based on concerns about jeopardized economic development (inability to perform simple credit card transactions and loss of broadband Internet access capability) and the risk to public safety (incompatibility with medical and alarm devices and the inability to operate during prolonged power outages). In extensive comments filed with the NYPSC, the Attorney General of New York pointed out the limitations of Voice Link, compared with wireline service, and the dangers for public safety, commerce, and the affordability of telephone service (by shifting the cost of

⁷⁷ Verizon’s web site includes this question and answer: “Are there functions that are not supported by Verizon Voice Link? At this time Verizon Voice Link is not compatible with monitored home security systems, fax machines, DVR services, dial up pay per view, credit card machines, or medical alert services (e.g. Life Alert). Currently we do not provide data (HSI/DSL) service with Verizon Voice Link.” <https://www.verizon.com/support/consumer/phone/voice-link>, site visited October 23, 2015. See Verizon’s Terms of Service. https://www.verizon.com/idc/groups/public/documents/adacct/verizon_voice_link.pdf, site accessed October 23, 2015.

⁷⁸ Verizon Section 214 Application of Verizon New York and Verizon New Jersey to Discontinue Telecommunications Service, filed June 7, 2013, WC Docket No. 13-150 and Comp File No. 1115 (“Verizon Section 214 Application”) at 5.

supplying power for telephone service from the phone company to its customers).⁷⁹

67. Following the major public outcry, both locally and at the FCC,⁸⁰ Verizon Communications abandoned its plans with regard to Voice Link on Fire Island and agreed to offer its replacement services over fiber. However, Verizon's did not change course with respect the New Jersey Barrier Islands, and its Section 214 application is still pending before the FCC, two and a half years after being filed.⁸¹ The plans that Verizon was determined to implement after Hurricane Sandy were not in the public interest, but had state and federal regulators not taken their respective roles very seriously, there would have been substantial negative consequences for consumers, the local economy, and public safety functions.

⁷⁹ State of New York Public Service Commission (NYPSC), Case 13-C-0197 -Tariff filing by Verizon New York, Inc. to introduce language under which Verizon could discontinue its current wireline service offerings in a specified area and instead offer a wireless service as its sole service offering in the area, Comments of Eric T. Schneiderman, Attorney General of the State of New York, July 2, 2013, at 8-9, cite omitted. The Attorney General also called for an investigation by the NYPSC based on evidence that Verizon was migrating customers elsewhere in the state to Voice Link, in violation of the Commission's order suspending the Voice Link tariff for investigation. Emergency Petition Of New York Attorney General Eric T. Schneiderman for an Order Preventing Verizon from Illegally Installing Voice Link Service in Violation of its Tariff and the Commission's May 16, 2013 Order, filed June 23, 2013.

⁸⁰ In footnote 5 of Public Notice DA 13-1758, "Applications of Verizon New Jersey Inc. and Verizon New York Inc. to Discontinue Domestic Telecommunications Services Will Not Be Automatically Granted," (released August 14, 2013), the FCC stated: "The Commission received more than 70 comments in WC Docket No. 13-150, with several commenters voicing concerns about the limitations of Voice Link service, its suitability as a replacement for the wireline telecommunications services Verizon proposes to discontinue, and the need for a thorough investigation of the issues involved in this proceeding." The FCC goes on to cite and briefly describe comments from AARP, the New York PSC and New Jersey Board of Public Utilities (NJBPU), the Communications Workers of America, NASUCA, and other public interest groups (e.g., Public Knowledge, The Utility Reform Network).

⁸¹ The most recent entries in this docket on the FCC's EDOCS electronic docket system are two protective orders; on August 14, 2013, the Commission issued a Public Notice indicating that the requested authority would not be automatically granted (DA 13-1758).

68. The FCC has considered the Fire Island experience as a cautionary tale with regard to service changes associated with copper retirement and has continued to refer to it in its subsequent orders. It has stated:

All stakeholders—including the Commission, industry, and consumers—gained valuable insights from the debate that ensued in 2013 when Verizon proposed to serve customers in parts of Fire Island with network facilities and services that differed in important ways from those available before Hurricane Sandy destroyed the legacy network. While that debate occurred in the context of an isolated occurrence, it foreshadowed issues with which the Commission will have to contend as carriers reach a point at which they will rationally seek to retire network facilities and discontinue TDM services on a wide-scale basis across the Nation.⁸²

69. Attempts to implement technology changes that diminish the functionality provided to consumers or that raise the prices and equipment costs that consumers pay are likely to encounter strong resistance in state and federal regulatory forums.⁸³

⁸² In the Matter of Ensuring Customer Premises Equipment for Backup Power for Continuity of Communications, et al., PS Docket No. 14-174, Notice of Proposed Rulemaking and Declaratory Order, (2014 *Tech Transitions NPRM/DO*), FCC Rcd 19468 footnote 36. See also, 2015 *Tech Transitions Order*, ¶ 15.

⁸³ This backlash is not limited to mandatory transitions involving wireless. State utility consumer advocates continue to press regulators to investigate Verizon's alleged failure to maintain its copper infrastructure and instead migrate customers to fiber. See, e.g., letter dated June 29, 2015 from the New Jersey Division of Rate Counsel to the New Jersey Board of Public Utilities requesting an investigation into Verizon's continued use of its copper infrastructure and Verizon's plan to migrate customers from its copper to its fiber network. This was subsequently assigned a docket number. In The Matter of Rate Counsel's Request for an Investigation into Verizon New Jersey, Inc.'s Continued Use of its Copper Infrastructure to Provide Telecommunications Services and Verizon New Jersey Inc.'s Transition Plan to Migrate Customers from its Copper-to-Fiber Infrastructure/Network in New Jersey. BPU Docket No. T015060749. See also letter dated August 27, 2015 from the New Jersey Division of Rate Counsel to the New Jersey Board of Public Utilities referring to "safe and orderly manner" for the IP transition process and quoting from the FCC's 2015 *Tech Transitions Order*, ¶ 96, which states in pertinent part that the FCC is "not preempting the ability of any state commission to evaluate an incumbent LEC's retirement of its copper loops to ensure such retirement complies with any applicable state legal or regulatory requirements."

III. ECONOMIC INCENTIVES DURING THE IP TRANSITION

70. There is no public policy justification for permitting the ILECs' transition to an IP network to serve as an excuse to jeopardize the quality of service offered to consumers. Consumers must receive adequate notice and education about any pending transition to an IP network in their community. However, ILECs' economic incentives regarding the maintenance of and investment in their copper networks do not always align with the public interest. For this reason, oversight on both the state and federal levels continues to be essential.
71. Notably, 48.6 million residential customers continue to rely on ILECs' copper-based voice service, a magnitude that underscores the importance of ensuring that consumers have reliable access to adequate copper-based voice service.⁸⁴ Nationally, ILECs use copper to serve 37% of households that continue to subscribe to wireline service and ILECs use VoIP to serve approximately 15% of those households that continue to subscribe to wireline service.⁸⁵
72. IP transitions vary among states, which demonstrates that the transition to IP is at varying stages throughout the country, with state regulators having the most immediate knowledge of the status of such transitions, and their impact on consumers. Regardless of the relative status of the IP transition, though, millions of customers continue to rely on ILECs' copper networks.

⁸⁴ FCC Voice Report, Figure 2.

⁸⁵ Id.

73. For example, although almost 19% of those California households that are served by wireline service are served over an ILEC's IP platform (1.415 million out of the 7.527 million households subscribing to wireline service), 2.455 million households continue to rely on ILECs' copper-based telephone service.⁸⁶ By contrast, in Iowa, FCC data as of June 2016 shows that of those households that continue to subscribe to wireline service, ILECs do not provide any VoIP lines, 66% of residential customers are served by ILEC switched access lines, 25% by non-ILEC VoIP lines and 9% by non-ILEC switched access lines.⁸⁷
74. Based on my experience in numerous state proceedings, I am concerned about the incentives that ILECs confront as they make network investment decisions and how those decisions affect the achievement of universal service, specifically of basic service offered at reasonably comparable levels of quality throughout an ILEC's service territory. These are issues that states are typically prepared to address.
75. ILECs' maintenance of copper networks is important because ILECs do not intend to deploy IP everywhere, and, even where they have plans to do so, the actual migration to IP may span a period of years.
76. States are uniquely qualified to ensure that consumers receive adequate reliable phone service. During these years of technology transition, PUCs are particularly familiar with the three general categories of communities in which ILECs' service quality merits oversight: (1) communities that are "post-transition" (i.e., that have

⁸⁶ Voice Telephone Services: Status as of June 30, 2016, FCC Industry Analysis and Technology Division, Wireline Competition Bureau, April 2017, Supplemental Table 1, Voice Subscription – California.

⁸⁷ Voice Telephone Services: Status as of June 30, 2016, FCC Industry Analysis and Technology Division, Wireline Competition Bureau, April 2017, Supplemental Table 1, Voice Subscription – Iowa.

been migrated to an IP platform); (2) communities where copper networks are slated for transition to IP but that are vulnerable to *de facto* retirement during the transition; and (3) communities where ILECs have no plans to deploy an IP platform, and which are especially vulnerable to neglect of the copper network.

77. The economic incentives confronting ILECs for their investment and maintenance practices differ among these communities, and the corresponding consumer impact differs accordingly.

IV. CONCLUSION

78. In conclusion, apart from any legal constraints on the FCC's proposed pre-emption of state oversight of ILECs' copper network, my analysis demonstrates that as a policy matter, continuing state and federal oversight of ILECs' copper network and services and IP transition continues to be essential.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on June 15, 2017

A handwritten signature in blue ink, appearing to read "Susan M. Baldwin", is written over a horizontal line.

Susan M. Baldwin

Appendix A

Statement of Qualifications of Susan M. Baldwin

SUSAN M. BALDWIN
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Susan M. Baldwin specializes in utility economics, regulation, and public policy. Since 2001, Ms. Baldwin has been an independent consultant. Ms. Baldwin has been actively involved in public policy for thirty-eight years, more than thirty of which have been in telecommunications policy and regulation. Ms. Baldwin received her Master of Economics from Boston University, her Master of Public Policy from Harvard University's John F. Kennedy School of Government, and her Bachelor of Arts degree in Mathematics and English from Wellesley College. Ms. Baldwin has extensive experience both in government and in the private sector.

Ms. Baldwin has testified before 21 public utility commissions, including: the Arkansas Public Service Commission, California Public Utilities Commission, Colorado Public Utilities Commission, Connecticut Department of Public Utility Control, District of Columbia Public Service Commission, Idaho Public Utilities Commission, Illinois Commerce Commission, Indiana Utility Regulatory Commission, Iowa Utilities Board, Maryland Public Service Commission, Massachusetts Department of Telecommunications and Cable, Nevada Public Service Commission, New Hampshire Public Utilities Commission, New Jersey Board of Public Utilities, Public Utilities Commission of Ohio, Pennsylvania Public Utility Commission, Rhode Island Public Utilities Commission, Tennessee Public Service Commission, Vermont Public Service Board, Washington Utilities and Transportation Commission, and the Public Service Commission of West Virginia. Ms. Baldwin has also authored numerous comments and declarations submitted in various Federal Communications Commission proceedings.

Ms. Baldwin has also participated in projects in Delaware, Hawaii, Illinois, New York, South Dakota, and Canada on behalf of consumer advocates, public utility commissions, and competitive local exchange carriers. Ms. Baldwin has served in a direct advisory capacity to public utility commissions in the District of Columbia, Massachusetts, New Mexico, Utah and Vermont. Ms. Baldwin has also testified on behalf of public utility commission staff in Idaho and Rhode Island. Ms. Baldwin has testified before state legislative committees in Maryland, Massachusetts, Ohio, and Pennsylvania.

Ms. Baldwin has sponsored expert reports in state taxation proceedings. Also, in her capacity as an independent consultant, Ms. Baldwin has consulted to and testified on behalf of consumer advocates on diverse matters including the electric retail market, consumer protection and consumer services issues in telecommunications, electric, and gas proceedings, broadband deployment, numbering resources, unbundled network element (UNE) cost studies, incumbent local exchange carriers' requests for competitive classification of services, mergers and spin-offs, rate cases, universal service, service quality, and state *Triennial Review Order* (TRO) proceedings. She co-sponsored testimony on behalf of the Connecticut Office of Consumer

Counsel regarding the electric retail market. She prepared comprehensive testimony analyzing mass market impairment on behalf of the New Jersey Division of Rate Counsel, the Arkansas Office of the Attorney General, and the Utah Committee of Consumer Services.

Ms. Baldwin has contributed to numerous comments submitted to the FCC on diverse aspects of broadband in various proceedings on topics such as data collection, mapping, deployment, universal service, affordability, consumer protection, and network management. Also, in state regulatory proceedings that have examined carriers' proposals for spin-offs and for mergers, she has recommended conditions concerning broadband deployment.

Ms. Baldwin served as a direct advisor to the Massachusetts Department of Telecommunications and Energy (DTE) between August 2001 and July 2003, in Massachusetts DTE Docket 01-20, an investigation of Verizon's total element long run incremental cost (TELRIC) studies for recurring and nonrecurring unbundled network elements (UNEs). She assisted with all aspects of this comprehensive case in Massachusetts. Ms. Baldwin analyzed recurring and nonrecurring cost studies; ran cost models; reviewed parties' testimony, cross-examined witnesses, trained staff, met with the members of the Commission, assisted with substantial portions of the major orders issued by the DTE; and also assisted with the compliance phase of the proceeding.

Ms. Baldwin has also contributed to numerous comments and declarations submitted to the Federal Communications Commission on issues such as broadband; intercarrier compensation reform; the Comcast-NBCU merger, price cap regulation; universal service; carriers' petitions for forbearance; separations reform; special access services, relay services; numbering optimization, and the Internet Protocol transition.

Ms. Baldwin worked with Economics and Technology, Inc. for twelve years (1984 to 1988 and 1992-2000), most recently as a Senior Vice President. Among her numerous projects were the responsibility of advising the Vermont Public Service Board in matters relating to a comprehensive investigation of NYNEX's revenue requirement and proposed alternative regulation plan. She participated in all phases of the docket, encompassing review of testimony, issuance of discovery, cross-examination of witnesses, drafting memoranda and decisions, and reviewing compliance filings. Another year-long project managed by Ms. Baldwin was the in-depth analysis and evaluation of the cost proxy models submitted in the FCC's universal service proceeding. Also, on behalf of the staff of the Idaho Public Utilities Commission, Ms. Baldwin testified on the proper allocation of US West's costs between regulated and non-regulated services. On behalf of AT&T Communications of California, Inc. and MCI Telecommunications Corporation, Ms. Baldwin comprehensively analyzed the non-recurring cost studies submitted by California's incumbent local exchange carriers. Ms. Baldwin has participated in more than twenty state and federal regulatory investigations of the impact of proposed transfers of control of wireline, wireless and cable companies.

Ms. Baldwin has contributed to the development of state and federal policy on numbering matters. On behalf of the Ad Hoc Telecommunications Users Committee, Ms. Baldwin

participated in the Numbering Resource Optimization Working Group (NRO-WG), and in that capacity, served as a co-chair of the Analysis Task Force of the NRO-WG. She has also provided technical assistance to consumer advocates in the District of Columbia, Illinois, Iowa, Massachusetts, and Pennsylvania on area code relief and numbering optimization measures. Ms. Baldwin also co-authored comments on behalf of the National Association of State Utility Consumer Advocates in the FCC's proceeding on numbering resource optimization.

During her first years at ETI, Ms. Baldwin was the Director of Publications and Tariff Research, and, in that capacity, she trained and supervised staff in the analysis of telecommunications rate structures, services, and regulation.

Ms. Baldwin served four years (1988-1992) as the Director of the Telecommunications Division for the Massachusetts Department of Public Utilities (now the Department of Telecommunications & Cable), where she directed a staff of nine, and acted in a direct advisory capacity to the DPU Commissioners. (The Massachusetts DTC maintains a non-separated staff, which directly interacts with the Commission, rather than taking an advocacy role of its own in proceedings). Ms. Baldwin advised and drafted decisions for the Commission in numerous DPU proceedings including investigations of a comprehensive restructuring of New England Telephone Company's rates, an audit of NET's transactions with its NYNEX affiliates, collocation, ISDN, Caller ID, 900-type services, AT&T's request for a change in regulatory treatment, pay telephone and alternative operator services, increased accessibility to the network by disabled persons, conduit rates charged by NET to cable companies, and quality of service. Under her supervision, staff analyzed all telecommunications matters relating to the regulation of the then \$1.7-billion telecommunications industry in Massachusetts, including the review of all telecommunications tariff filings; petitions; cost, revenue, and quality of service data; and certification applications. As a member of the Telecommunications Staff Committees of the New England Conference of Public Utility Commissioners (NECPUC) and the National Association of Regulatory Utility Commissioners (NARUC), she contributed to the development of telecommunications policy on state, regional, and national levels.

Ms. Baldwin has worked with local, state, and federal officials on energy, environmental, budget, welfare, and telecommunications issues. As a policy analyst for the New England Regional Commission (NERCOM), Massachusetts Department of Public Welfare (DPW), and Massachusetts Office of Energy Resources (MOER), she acquired extensive experience working with governors' offices, state legislatures, congressional offices, and industry and advocacy groups. As an energy analyst for NERCOM, Ms. Baldwin coordinated New England's first regional seminar on low-level radioactive waste, analyzed federal and state energy policies, and wrote several reports on regional energy issues. As a budget analyst for the DPW, she forecast expenditures, developed low-income policy, negotiated contracts, prepared and defended budget requests, and monitored expenditures of over \$100 million. While working with the MOER, Ms. Baldwin conducted a statewide survey of the solar industry and analyzed federal solar legislation.

Ms. Baldwin received Boston University's Dean's Fellowship. While attending the

Kennedy School of Government, Ms. Baldwin served as a teaching assistant for a graduate course in microeconomics and as a research assistant for the school's Energy and Environmental Policy Center, and at Wellesley College was a Rhodes Scholar nominee. She has also studied in Ghent, Belgium.

Record of Prior Testimony

In the matter of the Application of the New Jersey Bell Telephone Company for Approval of its Plan for an Alternative Form of Regulation, New Jersey Board of Regulatory Commissioners Docket No. T092030358, on behalf of the New Jersey Cable Television Association, filed September 21, 1992, cross-examined October 2, 1992.

DPUC review and management audit of construction programs of Connecticut's telecommunications local exchange carriers, Connecticut Department of Public Utility Control Docket No. 91-10-06, on behalf of the Connecticut Office of the Consumer Counsel, filed October 30, 1992, cross-examined November 4, 1992.

Joint petition of New England Telephone and Telegraph Company and Department of Public Service seeking a second extension of the Vermont Telecommunications Agreement, Vermont Public Service Board 5614, Public Contract Advocate, filed December 15, 1992, cross-examined December 21, 1992.

Application of the Southern New England Telephone Company to amend its rates and rate structure, Connecticut Department of Public Utility Control Docket No. 92-09-19, on behalf of the Connecticut Office of Consumer Counsel, filed March 26, 1993 and May 19, 1993, cross-examined May 25, 1993.

In the matter of the Application of Cincinnati Bell Telephone Company for Approval of an Alternative Form of Regulation and for a Threshold Increase in Rates, Public Utilities Commission of Ohio Case No. 93-432-TP-ALT, on behalf of Time Warner AxS, filed March 2, 1994.

Matters relating to IntraLATA Toll Competition and Access Rate Structure, Rhode Island Public Utilities Commission Docket 1995, on behalf of the Rhode Island Public Utilities Commission Staff, filed March 28, 1994 and June 9, 1994, cross-examined August 1, 1994.

In the Matter of the Application of The Ohio Bell Telephone Company for Approval of an Alternative Form of Regulation, Public Utilities Commission of Ohio Case No. 93-487-TP-ALT, on behalf of Time Warner AxS, filed May 5, 1994, cross-examined August 11, 1994.

In Re: Universal Service Proceeding: The Cost of Universal Service and Current Sources of Universal Service Support, Tennessee Public Service Commission Docket No. 95-02499, on behalf of Time Warner AxS of Tennessee, L.P., filed October 18, 1995 and October 25, 1995, cross-examined October 27, 1995.

In Re: Universal Service Proceeding: Alternative Universal Service Support Mechanisms, Tennessee Public Service Commission Docket No. 95-02499, on behalf of Time Warner AxS of Tennessee, L.P., filed October 30, 1995 and November 3, 1995, cross-examined November 7, 1995.

In the Matter of the Application of US West Communications, Inc. for Authority to Increase its Rates and Charge for Regulated Title 61 Services, Idaho Public Utilities Commission Case No. USW-S-96-5, on behalf of the Staff of the Idaho Public Utilities Commission, filed November 26, 1996 and February 25, 1997, cross-examined March 19, 1997.

A Petition by the Regulatory Operations Staff to Open an Investigation into the Procedures and Methodologies that Should Be Used to Develop Costs for Bundled or Unbundled Telephone Services or Service Elements in the State of Nevada, Nevada Public Service Commission Docket No. 96-9035, on

behalf of AT&T Communications of Nevada, Inc., filed May 23, 1997, cross-examined June 6, 1997.

Rulemaking on the Commission's Own Motion to Govern Open Access to Bottleneck Services and Establish a Framework for Network Architecture; Investigation on the Commission's Own Motion into Open Access and Network Architecture Development of Dominant Carrier Networks, California Public Utilities Commission R.93-04-003 and I.93-04-002, co-authored a declaration on behalf of AT&T Communications of California, Inc., and MCI Telecommunications Corporation, filed on December 15, 1997 and on February 11, 1998.

Consolidated Petitions for Arbitration of Interconnection Agreements, Massachusetts Department of Telecommunications and Energy, DPU 96-73/74, 96-75, 96-80/81, 96-83, and 96-84, on behalf of AT&T Communications of New England, Inc. and MCI Telecommunications Corporation, filed February 3, 1998.

In the Matter of the Application of US West Communications, Inc. for Specific Forms of Price Regulation, Colorado Public Utilities Commission Docket No. 97-A-540T, on behalf of the Colorado Office of Consumer Counsel, filed on April 16, 1998, May 14, 1998 and May 27, 1998, cross-examined June 2, 1998.

Joint Application of SBC Communications and Southern New England Telecommunications Corporation for Approval of a Change of Control, Connecticut Department of Public Utility Control Docket No. 98-02-20, on behalf of the Connecticut Office of Consumer Counsel, filed May 7, 1998 and June 12, 1998, cross-examined June 15-16, 1998.

Fourth Annual Price Cap Filing of Bell Atlantic-Massachusetts, Massachusetts Department of Telecommunications and Energy Docket DTE 98-67, on behalf of MCI Telecommunications Corporation, filed September 11, 1998 and September 25, 1998, cross-examined October 22, 1998.

Applications of Ameritech Corp., Transferor, and SBC Communications, Inc., Transferee, For Consent to Transfer Control, Federal Communications Commission CC Docket No. 98-141, co-sponsored affidavit on behalf of Indiana Utility Consumer Counselor, Michigan Attorney General, Missouri Public Counsel, Ohio Consumers' Counsel, Texas Public Utility Counsel and Utility Reform Network, filed on October 13, 1998.

In the Matter of the Joint Application of SBC Communications Inc., SBC Delaware, Inc., Ameritech Corporation and Ameritech Ohio for Consent and Approval of a Change of Control, Public Utilities Commission of Ohio Case No.98-1082-TP-AMT, on behalf of Ohio Consumers' Counsel, filed on December 10, 1998, cross-examined on January 22, 1999.

GTE Corporation, Transferor, and Bell Atlantic Corporation, Transferee, For Consent to Transfer Control, Federal Communications Commission CC Docket No. 98-184, co-sponsored an affidavit on behalf of a coalition of consumer advocates from Delaware, Hawaii, Maine, Maryland, Missouri, Ohio, Oregon, West Virginia, and Michigan, filed on December 18, 1998.

In the Matter of the Joint Application of GTE and Bell Atlantic to Transfer Control of GTE's California Utility Subsidiaries to Bell Atlantic, Which Will Occur Indirectly as a Result of GTE's Merger with Bell Atlantic, California Public Utilities Commission A. 98-12-005, on behalf of the California Office of Ratepayer Advocate, filed on June 7, 1999.

In the Matter of the Investigation on the Commission's Own Motion Into All Matters Relating to the Merger of Ameritech Corporation and SBC Communications Inc., Indiana Utility Regulatory Commission Cause No. 41255, on behalf of the Indiana Office of Utility Consumer Counselor, filed on June 22, 1999 and July 12, 1999, cross-examined July 20, 1999.

In re Application of Bell Atlantic Corporation and GTE Corporation for Approval of the GTE Corporation - Bell Atlantic Corporation Merger, Washington Utilities and Transportation Commission UT-981367, on behalf of the Washington Attorney General Public Counsel Section, filed on August 2, 1999.

Application of New York Telephone Company for Alternative Rate Regulation, Connecticut Department of Public Utility Control Docket No. 99-03-06, on behalf of the Connecticut Office of Consumer Counsel, filed October 22, 1999.

In re: Area Code 515 Relief Plan, Iowa Utilities Board Docket No. SPU-99-22, on behalf of Iowa Office of Consumer Advocate, filed November 8, 1999, and December 3, 1999, cross-examined December 14, 1999.

In re Application of MCI WorldCom, Inc. and Central Telephone Company - Nevada, d/b/a Sprint of Nevada, and other Sprint entities for Approval of Transfer of Control pursuant to NRS 704.329, Nevada Public Utilities Commission Application No. 99-12029, on behalf of the Nevada Office of the Attorney General, Bureau of Consumer Protection, filed April 20, 2000.

In re: Area Code 319 Relief Plan, Iowa Utilities Board Docket No. SPU-99-30, on behalf of Iowa Office of Consumer Advocate, filed June 26, 2000 and July 24, 2000.

In re: Sprint Communications Company, L.P. & Level 3 Communications, L.L.C., Iowa Utilities Board Docket Nos. SPU-02-11 & SPU-02-13, on behalf of Iowa Office of Consumer Advocate, filed October 14, 2002 and January 6, 2003, cross-examined February 5, 2003.

Illinois Bell Telephone Company filing to increase unbundled loop and nonrecurring rates (tariffs filed December 24, 2002), Illinois Commerce Commission Docket No. 02-0864, on behalf of Citizens Utility Board, filed May 6, 2003 and February 20, 2004.

Qwest Petition for Competitive Classification of Business Services, Washington Utilities and Transportation Commission Docket No. 030614, on behalf of Public Counsel, filed August 13, 2003 and August 29, 2003, cross-examined September 18, 2003.

In the Matter of the Application of CenturyTel of Northwest Arkansas, LLC for Approval of a General Change in Rates and Tariffs, Arkansas Public Service Commission Docket No. 03-041-U, on behalf of the Attorney General, filed October 9, 2003 and November 20, 2003.

In the Matter of the Board's Review of Unbundled Network Elements, Rates, Terms and Conditions of Bell Atlantic New Jersey, Inc., New Jersey Board of Public Utilities Docket No. TO00060356, on behalf of the New Jersey Division of the Ratepayer Advocate, filed January 23, 2004.

In the Matter of the Implementation of the Federal Communications Commission's Triennial Review Order, New Jersey Board of Public Utilities Docket No. TO03090705, on behalf of the New Jersey Division of the Ratepayer Advocate, filed February 2, 2004.

Unbundled Access to Network Elements, Review of the Section 251 Unbundling Obligations of Local Exchange Carriers, Federal Communications Commission WC Docket No. 04-313, CC Docket No. 01-338, sponsored affidavit on behalf of the New Jersey Division of the Ratepayer Advocate, filed October 4, 2004.

Unbundled Access to Network Elements, Review of the Section 251 Unbundling Obligations of Local Exchange Carriers, Federal Communications Commission WC Docket No. 04-313, CC Docket No. 01-338, sponsored affidavit on behalf of the Utah Committee of Consumer Services, filed October 4, 2004.

In the Matter of Verizon New Jersey, Inc. For a Revision of Tariff B.P.U.-N.J. – No. 2 Providing for a

Revenue Neutral Rate Restructure Including a Restructure of Residence and Business Basic Exchange Service and Elimination of \$.65 Credit, New Jersey Board of Public Utilities Docket No. TT04060442, on behalf of the New Jersey Division of the Ratepayer Advocate, filed December 22, 2004 and January 18, 2005.

In the Matter of the Application of Verizon New Jersey, Inc. for Approval (I) of a New Plan for an Alternative Form of Regulation and (II) to Reclassify Multi-Line Rate Regulated Business Services as Competitive Services, and Compliance Filing, New Jersey Board of Public Utilities Docket No. TO01020095, on behalf of the New Jersey Division of the Ratepayer Advocate, filed January 10, 2005 and February 4, 2005.

Joint Petition of SBC Communications Inc. and AT&T Corp., Together with its Certificated Subsidiaries for Approval of Merger, New Jersey Board of Public Utilities Docket No. TM05020168, on behalf of the New Jersey Division of the Ratepayer Advocate, filed May 4, 2005 and June 1, 2005.

In the Matter of Verizon Communications Inc. and MCI, Inc., Applications for Approval of Transfer of Control, Federal Communications Commission WC Docket No. 05-75, co-sponsored affidavit on behalf of the New Jersey Division of the Ratepayer Advocate, filed on May 9, 2005.

In the Matter of the Application of Southwestern Bell Telephone, L.P., d/b/a SBC Arkansas to Set Rates for Unbundled Network Elements, Arkansas Public Service Commission Docket No. 04-109-U, on behalf of the Attorney General, filed May 27, 2005.

Joint Petition of Verizon Communications Inc. and MCI, Inc. for Approval of Merger, New Jersey Board of Public Utilities Docket No. TM05030189, on behalf of the New Jersey Division of the Ratepayer Advocate, filed July 8, 2005 and August 19, 2005.

In the Matter of Joint Petition of United Telephone Company of New Jersey, Inc. d/b/a Sprint and LTD Holding Company for Approval Pursuant to *N.J.S.A. 48:2-51* and *N.J.S.A. 48:3-10* of a change in Ownership and Control, New Jersey Board of Public Utilities Docket No. TM05080739, on behalf of the New Jersey Division of the Ratepayer Advocate, filed November 29, 2005.

In the Matter of the Board's Review of the Classification of Verizon New Jersey's Directory Assistance Services ("DAS") as Competitive and Associated Service Quality, Docket No. TX06010057, In the Matter of the Filing by Verizon New Jersey Inc. for the Reclassification of Existing Rate Regulated Services – Directory Assistance Services as Competitive, New Jersey Board of Public Utilities, Docket No. TT97120889, on behalf of the New Jersey Division of the Ratepayer Advocate, filed May 12, 2006.

In the Matter of AT&T Inc. and BellSouth Corporation Applications for Approval of Transfer of Control, Federal Communications Commission WC Docket No. 06-74, sponsored declaration with Sarah M. Bosley on behalf of the New Jersey Division of the Ratepayer Advocate, filed June 5, 2006; sponsored declaration with Sarah M. Bosley and Timothy E. Howington on behalf of the New Jersey Division of Rate Counsel, October 3, 2006.

In the Matter of Jurisdictional Separations and Referral to the Federal-State Joint Board, CC Docket No. 80-286, sponsored affidavit on behalf of the National Association of State Utility Consumer Advocates and the New Jersey Division of Rate Counsel, filed August 22, 2006.

In the Matter of the Board Investigation Regarding the Reclassification of Competitive Local Exchange Carrier (CLEC) Services as Competitive, New Jersey Board of Public Utilities Docket No. TX06120841, on behalf of the New Jersey Division of Rate Counsel, filed January 7, 2007, January 30, 2007, and February 20, 2007.

Verizon New England Inc., Bell Atlantic Communications, Inc., NYNEX Long Distance Company,

Verizon Select Services Inc. and FairPoint Communications, Inc. Joint Petition for Authority to Transfer Assets and Franchise to FairPoint Communications, Inc., New Hampshire Public Utilities Commission Docket No. DT-07-011, on behalf of the Office of Consumer Advocate, filed August 1, 2007, cross-examined November 1, 2007.

In the Matter of the Commission's Investigation into Verizon Maryland, Inc.'s Affiliate Relationships, Maryland Public Service Commission Case No. 9120, on behalf of the Office of People's Counsel, filed October 29, 2007 and November 19, 2007, cross-examined November 28, 2007.

In the Matter of the Board Investigation Regarding the Reclassification of Incumbent Local Exchange Carrier (ILEC) Services as Competitive, New Jersey Board of Public Utilities Docket No. TX07110873, on behalf of the New Jersey Division of Rate Counsel, filed December 14, 2007, January 10, 2008.

In the Matter of Verizon Washington, DC Inc.'s Price Cap Plan 2007 for the Provision of Local Telecommunications Services in the District of Columbia, Public Service Commission of the District of Columbia Formal Case No. 1057, on behalf of the District of Columbia Office of People's Counsel, filed December 20, 2007, January 31, 2008.

In re Possible Extension of Board Jurisdiction over Single Line Flat-Rated Residential and Business Rates for Local Exchange Carriers, Iowa Utilities Board Docket No. INU-08-1, on behalf of Iowa Office of Consumer Advocate, filed March 17, 2008, April 28, 2008, cross-examined May 22, 2008.

Petition of the Office of Consumer Counsel for Enforcement of Quality of Service Standards for the Southern New England Telephone Company d/b/a AT&T Connecticut, Connecticut Department of Public Utility Control Docket No. 08-07-15, on behalf of the Communications Workers of America, Local 1298, filed January 30, 2009, cross-examined February 25, 2009.

In the Matter of the Board's Investigation and Review of Local Exchange Carrier Intrastate Exchange Access Rates, New Jersey Board of Public Utilities Docket No. TX08090830, on behalf of the New Jersey Division of Rate Counsel, filed February 13, 2009, April 20, 2009, and June 22, 2009, cross-examined October 20, 2009.

In the Matter of Appropriate Forms Of Regulating Telephone Companies, Maryland Public Service Commission, Case No. 9133, on behalf of the Communications Workers of America, filed June 1, 2009, October 16, 2009, October 30, 2009, cross-examined November 4, 2009.

Petition of the Office of Consumer Counsel for Enforcement of Quality of Service Standards for the Southern New England Telephone Company d/b/a AT&T Connecticut, Connecticut Department of Public Utility Control Docket No. 08-07-15PH02, on behalf of the Communications Workers of America, Local 1298, filed September 21, 2009.

In the Matter of the Application of Frontier Communications Corporation, New Communications Holdings, Inc. and Verizon Communications Inc. for Consent and Approval of a Change in Control, Public Utilities Commission of Ohio Case No. 09-454-TP-ACO, on behalf of the Communications Workers of America and International Brotherhood of Electrical Workers, Local 986, filed October 14, 2009.

Frontier Communications Corporation, Verizon Communications, Inc., Verizon North Inc., Verizon South Inc., New Communications of the Carolinas, Inc. Joint Application for the approval of a Reorganization, Illinois Commerce Commission Docket No. 09-0268, on behalf of the International Brotherhood of Electrical Workers, Locals 21, 51, and 702, filed October 20, 2009.

In re Verizon Service Quality in Western Massachusetts, Massachusetts Department of Telecommunications and Cable D.T.C. 09-1, on behalf of the Office of the Attorney General, filed

November 9, 2009, February 24, 2010, cross-examined March 31, 2010, April 1, 2010, May 21, 2010.

Joint Application of Frontier Communications Corporation and Verizon West Virginia Inc. and certain affiliates for approval of the transfer of Verizon's local exchange and long distance business in West Virginia to companies to be owned and controlled by Frontier Communications Corporation, Public Service Commission of West Virginia Case No. 09-0871-T-PC, on behalf of the Communications Workers of America, AFL-CIO, filed November 16, 2009.

In the Matter of Qwest Communications Company and CenturyTel, Inc. for Approval of Control of Qwest Communications Company LLC, New Jersey Board of Public Utilities Docket No. TM10050343, on behalf of the New Jersey Division of Rate Counsel, filed September 23, 2010.

Petition of the North American Numbering Plan Administrator on behalf of the Pennsylvania Telecommunications Industry for Approval of Numbering Plan Area Relief Planning for the 814 NPA, Pennsylvania Public Utility Commission Docket No. P-2009-2112925, on behalf of the Pennsylvania Office of Consumer Advocate, filed May 23, 2011, cross-examined May 24, 2011.

In re Applications of AT&T, Inc. and Deutsche Telekom AG for Consent to the Transfer of Control of the Licenses and Authorizations Held by T-Mobile USA, Inc. and its Subsidiaries to AT&T Inc., WT Docket No. 11-65, File Nos. 0004669383, *et al.*, sponsored declarations on behalf of the New Jersey Division of Rate Counsel, May 31, 2011, and June 20, 2011.

In the Matter of Application of Cellco Partnership d/b/a Verizon Wireless and SpectrumCo LLC For Consent To Assign Licenses and Application of Cellco Partnership d/b/a Verizon Wireless and Cox TMI Wireless, LLC For Consent To Assign Licenses, WT Docket No. 12-4, sponsored declarations on behalf of the New Jersey Division of Rate Counsel, filed February 17, 2012, and March 26, 2012.

In the Matter of the Board's Investigation Regarding the Reclassification of Incumbent Local Exchange Carrier (ILEC) Services as Competitive – Phase II, New Jersey Board of Public Utilities Docket No. TX11090570, on behalf of the New Jersey Division of Rate Counsel, filed February 24, 2012, April 27, 2012, and June 11, 2012, cross-examined July 17, 2012.

Petition of David K. Ebersole, Jr. and the Office of Consumer Advocate for a Declaratory Order that Verizon Pennsylvania Inc. Has Not Met Its Legal Obligation to the Greensburg Bona Fide Retail Request Group Pursuant to Its Chapter 30 Plan, Pennsylvania Public Utility Commission Docket No. P-2012-2323362, affidavit on behalf of the Pennsylvania Office of Consumer Advocate, September 6, 2012.

In the Matter of Commission Consideration Of Effective Competition Areas and the Classification of Basic Local Exchange Service, Colorado Public Utilities Commission Proceeding Number 13M-0422T, Pursuant to 4 CCR 723-2-2213, answer testimony on behalf of AARP, December 6, 2013, cross-examined January 7, 2014.

PURA Establishment of Rules for Electric Suppliers and EDCs Concerning Operations and Marketing in the Electric Retail Market, Connecticut Public Utilities Regulatory Authority Docket No. 13-07-18, testimony and supplemental testimony on behalf of the Connecticut Office of Consumer Counsel, March 10, 2014 and March 17, 2014, cross-examined March 27, 2014.

Joint Application of Frontier Communications Corporation and AT&T Inc. for Approval of a Change in Control, Connecticut Public Utilities Regulatory Authority Docket No. 14-01-46, testimony on behalf of the Connecticut Office of Consumer Counsel, May 23, 2014, cross-examined June 30, 2014.

The Utility Reform Network, Complainant vs. Pacific Bell Telephone Company D/B/A AT&T California (U1001C); AT&T Communications of California, Inc. (U5002C), Defendants, California Public Utilities Commission Case No. 13-12-005, Complaint of the Utility Reform Network Regarding Basic Service

Rates of AT&T California (Public Utilities Code Section 1702; Commission Rule of Practice and Procedure 4.1(b)), December 6, 2013, initial and rebuttal testimony on behalf of the Utility Reform Network (TURN), August 22, 2014 and October 3, 2014.

Joint Petition of Verizon Pennsylvania LLC and Verizon North LLC for Competitive Classification of all Retail Services in Certain Geographic Areas, and for a Waiver of Regulation for Competitive Services, Pennsylvania PUC Docket Nos. P-2014-2446303 and P-2014-2446304, direct and surrebuttal testimony on behalf of Communications Workers of America and the International Brotherhood of Electrical Workers, November 14, 2014, and December 12, 2014, cross-examined December 16, 2014.

Joint Application of Comcast Corporation, Time Warner Cable Inc., Time Warner Cable Information Services (California), LLC, and Bright House Networks Information Services (California), LLC for Expedited Approval of Indirect Transfer of Control of Time Warner Cable Information Services (California), LLC, (U-68740-C); and The Pro Forma Transfer of Control of Bright House Networks Information Services (California), LLC (U-6955-C) to Comcast Corporation, Pursuant to Public Utilities Code Section 854(A), Application No. 14-04-013 (filed April 11, 2014), initial and reply testimony on behalf of the Utility Reform Network (TURN), December 3, 2014 and December 10, 2014.

In the Matter of the Joint Application of Frontier Communications Corporation, Frontier Communications of America, Inc. (U 5429 C), Verizon California Inc. (U 1002 C), Verizon Long Distance, LLC (U 5732), and Newco West Holdings LLC for Approval of Transfer of Control Over Verizon California Inc. and Related Approval of Transfer of Assets and Certifications (Filed March 18, 2015), Application 15-03-005, reply and supplemental testimony on behalf of the Utility Reform Network (TURN), July 28, 2015 and September 11, 2015.

Order Instituting Investigation to Assess the State of Competition Among Telecommunications Providers in California, and to Consider and Resolve Limited Rehearing of Decision (D.) 08-09-042, California Public Utilities Commission Investigation 15-11-007 (November 5, 2015), testimony on behalf of the Utility Reform Network (TURN), March 15, 2016, June 1, 2016 and July 15, 2016; participated in Expert Panel, July 20, 2016.

Petition of Communications Workers of America for a Public, On-the-Record Commission Investigation of the Safety, Adequacy, and Reasonableness of Service Provided by Verizon Pennsylvania, LLC, Pennsylvania PUC Docket No. P-2015-2509336, direct testimony on behalf of Communications Workers of America, September 29, 2016.

Petition of the Maryland Office of People's Counsel for an Investigation into Verizon Maryland's Provision of Basic Local Phone Service Over Copper or Fiber Networks, affidavit on behalf of the Maryland Office of People's Counsel, January 13, 2017.

In re: Deregulation of Local Exchange Service, Iowa Utilities Board Docket No. INU-2016-0001, testimony on behalf of Office of Consumer Advocate, February 17, 2017 and April 21, 2017, cross-examined May 23, 2017.

Proceeding on Motion of the Commission to Consider the Adequacy of Verizon New York Inc.'s Retail Service Quality Processes and Programs, New York Public Service Commission Case 16-C-0122, testimony on behalf of the Communications Workers of America, March 24, 2017.

Testimony before State Legislatures:

Testified on September 24, 1997, before the Massachusetts State Legislature Joint Committee on Government Regulations regarding House Bill 4937 (concerning area codes).

Testified on March 2, 2010, before the Maryland State Legislature Senate Finance Committee regarding Senate Bill 677 (concerning Telephone Landline Sale Bill).

Testified on March 11, 2010, before the Maryland State Legislature House Economic Matters Committee regarding House Bill 937 (concerning Telephone Landline Sale Bill).

Testified on June 25, 2013, on behalf of AARP, before the Ohio Select Committee on Telecommunications Regulatory Reform (regarding SB 162).

Testified on December 12, 2013, on behalf of AARP, before the Pennsylvania House Consumer Affairs Committee (regarding House Bill 1608).

Reports/Publications/Presentations

Expert reports in tax matters, reports and publications on telecommunications and energy policy in trade journals, and presentations at industry associations and conferences include the following:

Expert reports in tax matters:

Iowa Department of Inspections and Appeals, In the Matter of Cable One, Inc. v. Iowa Department of Revenue, DIA 10DORFC014, SBTR Nos. 899 and 903, Property Tax Assessment, Expert Report, January 21, 2011 (on behalf of the Iowa Department of Revenue), deposited February 9, 2011.

Level 3 Communications, LLC. v. Arizona Department of Revenue; Coshise County; Graham County; Greenlee County; La Paz County; Maricopa County; Mohave County; Pima County, Pinal County and Yuma County, Superior Court of the State of Arizona in the Arizona Tax Court, No. TX-2007-000594, Expert Report, May 20, 2011 (on behalf of the Arizona Department of Revenue), deposited July 14, 2011; cross-examined August 24, 2012.

Bresnan Communications, LLC, Plaintiff, v. State of Montana Department of Revenue, Defendant, Cause No. DV-10-1312, July 5, 2011 (on behalf of the Montana Department of Revenue), deposited July 29, 2011.

Verizon California Inc., Plaintiff, v. California Board of Equalization, Defendants, December 18, 2015 (on behalf of the California Board of Equalization), deposited January 20, 2016.

Reports and Publications:

“The Cable-Telco Duopoly’s Deployment of New Jersey’s Information Infrastructure: Establishing Accountability” (with Sarah M. Bosley and Timothy E. Howington). Prepared for the Public Advocate of New Jersey, January 19, 2007.

“Assessing SBC/Pacific’s Progress in Eliminating Barriers to Entry: The Local Market in California Is Not Yet ‘Fully and Irreversibly Open’” (with Patricia D. Kravtin, Dr. Lee L. Selwyn, and Douglas S. Williams). Prepared for the California Association of Competitive Telecommunications Companies, July 2000.

“Where Have All the Numbers Gone? (Second Edition): Rescuing the North American Numbering Plan from Mismanagement and Premature Exhaust” (with Dr. Lee L. Selwyn). Prepared for the Ad Hoc Telecommunications Users Committee, June 2000.

“Price Cap Plan for USWC: Establishing Appropriate Price and Service Quality Incentives for Utah” (with Patricia D. Kravtin and Scott C. Lundquist). Prepared for the Utah Division of Public Utilities, March 22, 2000.

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“The Use of Cost Proxy Models to Make Implicit Support Explicit, Assessing the BCPM and the Hatfield Model 3.1” (with Dr. Lee L. Selwyn). Prepared for the National Cable Television Association, submitted in FCC CC Docket No. 96-45, March 1997.

“The Use of Forward-Looking Economic Cost Proxy Models” (with Dr. Lee L. Selwyn). Prepared for the National Cable Television Association, submitted in FCC Docket No. CCB/CPB 97-2, February 1997.

“Continuing Evaluation of Cost Proxy Models for Sizing the Universal Service Fund, Analysis of the Similarities and Differences between the Hatfield Model and the BCM2” (with Dr. Lee L. Selwyn). Prepared for the National Cable Television Association, submitted in FCC CC Docket No. 96-45, October 1996.

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“The BCM Debate, A Further Discussion” (with Dr. Lee L. Selwyn and Helen E. Golding). Prepared for the National Cable Television Association, submitted in FCC CC Docket No. 96-45, May 1996.

“The Cost of Universal Service, A Critical Assessment of the Benchmark Cost Model” (with Dr. Lee L. Selwyn). Prepared for the National Cable Television Association, submitted in FCC CC Docket No. 96-45, April 1996.

“Funding Universal Service: Maximizing Penetration and Efficiency in a Competitive Local Service Environment” (with Dr. Lee L. Selwyn). Prepared for Time Warner Communications, Inc., October 1995.

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Presentations:

“Back to Basics: What Specific Consumer Protections Are Still Needed in Telecommunications Regulation?,” Presentation at the Mid-Atlantic Conference of Regulatory Utilities Commissioners 21st Annual Education Conference, Williamsburg, Virginia, June 23, 2016.

“The Three Rs: The Need for Reliable, Redundant and Resilient Telecommunications in the New Age,” 2015 National Association of State Utility Consumer Advocates Annual Meeting, Austin, Texas, November 9, 2015.

“Telecommunications in Transition: Advocating for 50+ Consumers in the Brave New World,” Presentation at AARP’s State Advocacy and Strategy Integration conference on “State Regulatory and Legislative Landscapes,” Portland, Oregon, September 16, 2014.

“What the IP Transition Means for Consumers and a Ubiquitous, Affordable, Reliable National Communications System,” 2014 National Association of State Utility Consumer Advocates Mid-Year Meeting, Santa Fe, New Mexico, June 2, 2014.

“For Sale - The National Wireline Communications System,” 2014 National Association of State Utility Consumer Advocates Mid-Year Meeting, Santa Fe, New Mexico, June 3, 2014.

“FCC Review of Verizon’s Section 214 Application and Its Implications for the IP Transition,” NASUCA Annual Meeting, Orlando, Florida, November 19, 2013.

“What gets lost in the IP Transition?” NASUCA Annual Meeting, Orlando, Florida, November 18, 2013.

“Service Outage and Restoration,” NARUC Staff panel, NARUC 125th Annual Meeting, Orlando, Florida, November 16, 2013.

“You Don’t Know What You’ve Got Til It’s Gone – Utilities Consumer Protections,” Presentation at AARP’s State Advocacy and Strategy Integration conference on “Fighting for Consumers,” Minneapolis, Minnesota, September 19, 2013.

“Protecting Consumers’ Assets and Income,” Presentation at the National Association of Latino Elected and Appointed Officials Policy Institute on “The Changing Dynamics of the Latino 50+ Population,” Albuquerque, New Mexico, August 25, 2013.

“Federalism in the 21st Century,” Presentation at the Mid-Atlantic Conference of Regulatory Utilities Commissioners 18th Annual Education Conference, Hershey, Pennsylvania, June 24, 2013.

“Trials for the Transition from TDM to IP,” Presentation at the New England Conference of Public Utilities Commissioners 66th Annual Symposium, Groton, Connecticut, June 11, 2013.

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“FCC Lifeline/Link Up Reform Order – What will it mean for regulators, consumers, and companies?” Presentation at the Mid-America Regulatory Conference, Des Moines, Iowa, June 11, 2012.

“Improving the Separations Process: Consumer Impact,” panelist for Federal-State Joint Board on Separations on behalf of the National Association of State Utility Consumer Advocates and the New Jersey Division of Rate Counsel, September 24, 2010, CC Docket No. 80-286, Washington, DC.

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“Deregulation and Price Increases: The Hallmarks of a Competitive Market?” November 18, 2008; 2008 National Association of State Utility Consumer Advocates Annual Meeting, New Orleans, Louisiana.

“Forbearance: What is it? What’s wrong with it? How to fix it,” November 12, 2007; “Net Neutrality – Not Dead Yet!,” November 13, 2007; 2007 National Association of State Utility Consumer Advocates Annual Meeting, Anaheim, California.

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“Impact of Federal Regulatory Developments on Consumers and Consumers’ Impact on Regulatory Developments,” Presentation for the Washington Attorney General’s Office, Seattle, Washington, May 27, 2003.

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“Exploring Solutions for Number Exhaust on the State Level” and “A Forum for Clarification and Dialogue on Numbering Ideas,” ICM Conference on Number Resource Optimization, New Orleans, Louisiana, December 10-11, 1998.

“Telecommunications Mergers: Impact on Consumers,” AARP Legislative Council 1998 Roundtable Meeting, Washington, D.C., November 18, 1998.

“Consumer Perspectives on Incumbent Local Exchange Carrier Mergers,” National Association of Regulatory Utility Commissioners 110th Annual Convention, Orlando, Florida, November 11, 1998.

Federal Communications Commission En Banc Hearing on “Proposals to Revised the Methodology for

Determining Universal Service Support,” CC Docket Nos. 96-45 and 97-160,” June 8, 1998, panelist.

“Universal Service: Real World Applications,” 1997 National Association of State Utility Consumer Advocates Mid-Year Meeting, Charleston, South Carolina, June 9, 1997.

“Modeling operating and support expenses” and “Modeling capital expenses,” panelist for Federal-State Joint Board on Universal Service Staff Workshops on Proxy Cost Models, January 14-15, 1997, CC Docket 96-45.

“Evaluating the BCM2: An Assessment of Its Strengths and Weaknesses,” presentation to the AT&T Cost Team (with Michael J. DeWinter), December 4, 1996.

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“Converging on a Model: An Examination of Updated Benchmark Cost Models and their Use in Support of Universal Service Funding.” Presentation to the National Association of Regulatory Utility Commissioners Summer Committee Meetings, July 22, 1996.

“ETI's Corrections to and Sensitivity Analyses of the Benchmark Cost Model.” Presentation to the Staff of the Federal-State Joint Board on Universal Service,” May 30, 1996.

“Redefining Universal Service.” Presentation at the *Telecommunications Reports* conference on “Redefining Universal Service for a Future Competitive Environment,” Washington, D.C., January 18, 1996.

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“Stranded Investment and the New Regulatory Bargain,” (with Lee L. Selwyn, under the direction of Donald Shephard), a Time Warner Communications Policy White Paper, September 1995.

“New Frontiers in Regulation.” Presentation to the New England Women Economists Association, December 12, 1995.

“Local Cable and Telco Markets.” Presentation at the New England Conference of Public Utilities Commissioners 46th Annual Symposium, Dixville Notch, New Hampshire, June 29, 1993.

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“Crafting a Rational Path to the Information Age.” Presentation at the State of New Hampshire's conference on the “Twenty-First Century Telecommunications Infrastructure,” Durham, New Hampshire, April 1993.

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Advisor to:

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