

**ATTACHMENT 2**

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

In the Matter of )  
Petition of USTelecom for Forbearance )  
Pursuant to 47 U.S.C. § 160(c) to Accelerate ) WC Docket No. 18-141  
Investment in Broadband and Next-Generation )  
Networks )

DECLARATION OF WILLIAM P. ZARAKAS

I. Introduction

1. My name is William P. Zarakas. I am a Principal with The Brattle Group, an economics consulting firm, where I work primarily on economic and regulatory matters concerning the communications and energy industries. I have been involved in the economic analysis of issues facing these industries for roughly 30 years. I have provided reports and/or testimony before the Federal Communications Commission (FCC), the Federal Energy Regulatory Commission (FERC), the Securities and Exchange Commission (SEC), the Copyright Royalty Judges (Library of Congress), the U.S. Congress, state regulatory agencies, arbitration panels, foreign governments, and courts of law. I have previously provided testimony to the FCC on a range of issues and proceedings, including the economics and feasibility of deploying broadband networks and competitive analysis with respect to the market for business service data (BDS), market share and churn analyses, cost models, foreclosure and bargaining models, and pole attachments matters. My CV is attached as **Attachment A**.
2. I understand that USTelecom has petitioned the Federal Communications Commission (“FCC”) to forbear from applying the unbundling, resale, and non-discrimination obligations included in Section 251 of the Communications Act (“Act”). Forbearance from Section 251 obligations would mean that competitive local exchange carriers (“CLECs”)

would not have access to unbundled network elements (“UNEs”) and/or services (that they can resell) from incumbent local exchange carriers (“ILECs”) at rates prescribed by state regulatory commissions following the pricing methodologies set forth by the FCC when it implemented the Act. USTelecom represents that the telecommunications market in the U.S. should be considered to be competitive on a nationwide basis and, accordingly, ILECs should no longer be obligated to provide access to their networks at regulated rates.

However, should competition be less intense or less ubiquitous than USTelecom asserts, forbearing from Section 251 could instead slow the deployment of broadband infrastructure and, in many geographic markets, impede consumer access to broadband.

3. I have been asked by Counsel for INCOMPAS to use available data to assess whether or not CLECs have, in fact, used UNEs as “stepping stones” in building out their own broadband facilities. Counsel also requested that I examine the benefits that CLECs have provided to consumers (in terms of speed and price) when they use UNEs as components in providing broadband service.
4. I analyzed the business models and service offering for three INCOMPAS member CLECs, together with the scope of facilities that are in place in the census blocks where they currently operate. INCOMPAS has indicated that Mammoth Networks (“Mammoth”) (operating in the western U.S.),<sup>1</sup> Socket Telecom, LLC (“Socket”) (operating in rural Missouri), and Sonic Telecom, LLC (“Sonic”) (operating in California) are representative of its member CLECs.<sup>2</sup> Together, Mammoth, Socket and Sonic provide broadband and other telecommunications services in 24,737 census blocks.<sup>3</sup> I used data available from the FCC,<sup>4</sup> to determine the degree of facilities-based competition in these locations and to

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<sup>1</sup> Specifically in the former U.S. West states (now part of CenturyLink).

<sup>2</sup> Mammoth and Socket serve mainly rural areas, while Sonic provides service in urban and suburban California. Socket and Sonic serve a primarily residential customer base, while Mammoth also has a sizable business customer base. Finally, Sonic is one of the larger CLECs that provides service to mass market customers, while Socket and Mammoth are notably smaller.

<sup>3</sup> This analysis does not include any census blocks where the CLECs offer services that are not required to be reported on FCC Form 477.

<sup>4</sup> Fixed Broadband Deployment Data from FCC Form 477. Per the FCC: all facilities-based broadband providers are required to file data with the FCC twice a year (Form 477) on where they offer Internet access service at speeds exceeding 200 kbps in at least one direction. Fixed providers file lists of census blocks in which they can or do offer service to at least one location within the census block. The most recent dataset available at this time represents the status of broadband deployment as of the end of 2016 (December 2016 v1 dataset).

determine the extent to which the fiber networks have been deployed (by ILECs, CLECs or others). I also examined the largest CLEC in this panel, Sonic, in additional detail. (By itself, Sonic provides service in over 80% of the subject census blocks). I compared Sonic’s fiber deployments to fiber build-outs by the ILECs (mainly, AT&T) that operate in the same census blocks as Sonic. I also compared Sonic’s broadband over copper product offerings with those offered by the ILEC; that is, a comparison of what each offers consumers using the same copper-based facilities, in terms of speed and price.

**II. UNE-based CLECs have deployed more fiber in the census blocks where they provide service than the ILECs have.**

5. Table 1 summarizes the copper and fiber network options available in the 24,737 census blocks under study. The table indicates that, as expected, the ILEC copper network is ubiquitously present. In addition, the table indicates that, at the end of 2016, CLECs had fiber in place in 8% of the census blocks (2,081 out of 24,737 blocks), while the ILECs trailed, having deployed fiber in 1,595 (6%) of the subject census blocks.

**Table 1: Scope of Telecommunications Facilities  
by Number of Census Blocks (Dec. 2016)**

	ILEC		CLEC	Cable	Total
	Copper	Fiber	Fiber	Fiber	
Mammoth	61	8	46	1	69
Socket	3,933	677	698	115	4,402
Sonic	19,771	910	1,337	198	20,266
<b>Total</b>	<b>23,765</b>	<b>1,595</b>	<b>2,081</b>	<b>314</b>	<b>24,737</b>

Notes and sources:  
 FCC Form 477 data, December 2016 v1. Analysis by The Brattle Group.  
 The sum of census blocks for a given carrier may exceed the total census blocks under study; e.g., the ILEC may offer both fiber and copper based services in a single census block.

6. shows that the CLECs provide broadband over bare copper UNEs in 97% of the subject census blocks (22,656 with only UNE service and 1,352 with both UNE and fiber service, out of 24,737 blocks) – which provides a method for them to build the customer base necessary for them to fund their fiber networks. However, and importantly, as shown

above, CLECs are migrating from UNE-based services to full facilities-based services by actively deploying fiber, more so than have the ILECs.

7. Table 2 shows that the CLECs provide broadband over bare copper UNEs in 97% of the subject census blocks (22,656 with only UNE service and 1,352 with both UNE and fiber service, out of 24,737 blocks) – which provides a method for them to build the customer base necessary for them to fund their fiber networks. However, and importantly, as shown above, CLECs are migrating from UNE-based services to full facilities-based services by actively deploying fiber, more so than have the ILECs.

**Table 2: CLEC Service Provision  
by Number of Census Blocks (Dec. 2016)**

	UNEs Only		CLEC Fiber Only		Both		Total
Mammoth	23	33%	45	65%	1	1%	69
Socket	3,704	84%	342	8%	356	8%	4,402
Sonic	18,929	93%	342	2%	995	5%	20,266
<b>Total</b>	<b>22,656</b>	<b>92%</b>	<b>729</b>	<b>3%</b>	<b>1,352</b>	<b>5%</b>	<b>24,737</b>

Notes and sources:  
FCC Form 477 data, December 2016 v1. Analysis by The Brattle Group.

8. shows that the CLECs provide broadband over bare copper UNEs in 97% of the subject census blocks (22,656 with only UNE service and 1,352 with both UNE and fiber service, out of 24,737 blocks) – which provides a method for them to build the customer base necessary for them to fund their fiber networks. However, and importantly, as shown above, CLECs are migrating from UNE-based services to full facilities-based services by actively deploying fiber, more so than have the ILECs.
9. Table 2 also shows that the smallest CLEC reviewed, Mammoth, to date provides broadband over its own fiber network in 66% of the census blocks in which it provides service. Socket, a broadband provider in rural Missouri, has already deployed fiber in 16% of its census blocks. In terms of sheer scope of investment, Sonic, the largest CLEC reviewed, has built out fiber to over 1,300 census blocks, and has deployed more fiber since then.

**III. CLECs use UNEs as a stepping stone to build-out their own fiber facilities.**

10. I assessed whether or not CLECs use UNEs as an interim step in building-out their own networks, as intended by the Act, by examining Sonic’s business model and network evolution. Sonic is a comparatively large CLEC, providing internet access and voice services primarily to residential customers in California.<sup>5</sup> Sonic provides its reported services over its own fiber network and through a combination of bare copper UNEs and Sonic digital subscriber line (DSL) equipment.<sup>6</sup> Sonic also utilizes UNE dark fiber transport to connect its network.<sup>7</sup>
11. Table 3 provides a breakdown of the facilities in place across the census blocks in which Sonic operates. There is only one full facilities-based provider (i.e., the ILEC) in 2.7% of the subject census blocks, and only two full facilities-based providers in 91.0% of the census blocks under study.<sup>8</sup> Three full facilities-based providers are in the 1,281 census blocks where Sonic has built-out its own fiber network.<sup>9</sup>

**Table 3: Summary of Underlying Loop Facilities in Census Blocks where Sonic Operates (as of Dec. 2016)**

	Number of Blocks	Percent of Total
ILEC Facilities Only (copper and fiber)	549	2.7%
ILEC + Cable Facilities	18,380	90.7%
ILEC + Sonic Facilities (no cable)	56	0.3%
ILEC + Cable + Sonic Facilities	1,281	6.3%
<b>Total Census Blocks</b>	<b>20,266</b>	<b>100.0%</b>

Notes and sources: FCC Form 477 data, December 2016 v1. Analysis by The Brattle Group.

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<sup>5</sup> Roughly 88% of Sonic’s customers are residential, 9% are small business, and 3% are enterprise customers.  
<sup>6</sup> Declaration of Dane Jasper ¶ 4 (“Sonic Decl.”), attached to Comments of Sonic Telecom, LLC, WC Docket No. 18-141 (filed Aug. 6, 2018).  
<sup>7</sup> Sonic Decl. ¶ 7.  
<sup>8</sup> In most cases, the two providers consist of the ILEC and the cable company (18,380 census blocks. However, there are several census blocks in which the ILEC and Sonic both have facilities in place, while there are no cable facilities present (56 census blocks).  
<sup>9</sup> There are 1,186 census blocks where Sonic alone has fiber facilities in place plus 95 blocks where both Sonic and the ILEC have deployed fiber.

12. Table 4 provides a breakdown of the carriers that advertise broadband services to consumers in the subject 20,266 census blocks at maximum speeds of 25 Mbps (download) / 3 Mbps (upload) or greater. As shown in the table, Sonic is the only provider that offers internet service to consumers at these speed levels in all 20,266 census blocks, and is the only carrier that offers 25/3 Mbps service in 523 of the subject census blocks. There are no blocks in which the ILEC or the cable provider is the only provider offering service at 25/3 or greater. The ILEC meets this minimal level in only half of the census blocks in which Sonic operates. The table also shows that, without Sonic’s fiber and UNE-based broadband services, at this level, consumers would be limited to only one option in half of these census blocks. That is, without Sonic, consumers would be able to receive 25/3 Mbps or greater service from monopoly or, at best, duopoly suppliers, a situation that economists caution can be harmful to consumers.<sup>10</sup> Furthermore, without Sonic, consumers in 523 census blocks would not be able to receive 25/3 Mbps service at all.

**Table 4: Speed of Services Provided in  
Census Blocks where Sonic Operates (as of Dec. 2016)**

	Blocks Served at >=25/3 Mbps	Percent of Total
Sonic Only	523	2.6%
ILEC + Sonic	82	0.4%
Cable + Sonic	9,832	48.5%
ILEC + Cable + Sonic	9,829	48.5%
<b>Total Blocks</b>	<b>20,266</b>	<b>100.0%</b>

Notes and sources: FCC Form 477 data, December 2016 v1. Analysis by The Brattle Group.

13. Table 5 shows the pattern of Sonic’s growth as well as the deployment of fiber facilities over time (Sonic versus ILEC) in the 20,266 census blocks, from the end of 2014 through

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<sup>10</sup> David E. M. Sappington, *Premature, Ubiquitous Forbearance Will Harm Consumers*, at 8 (“Sappington”), attached to the accompanying Opposition as Attachment 1.

the end of 2016.<sup>11</sup> Over this timeframe, the number of census blocks in which fiber facilities are reported to be in place grew by a factor of nearly 80: from 28 census blocks at the end of 2014 to 2,147 census blocks at the end of 2016. Sonic’s deployment of fiber facilities has grown faster than that of the ILECs. The number of census blocks in which Sonic provides fiber-based internet access services has grown by a factor of nearly 50, from 25 at the end of 2015 to 1,237 at the end of 2016 (and it did not have any fiber facilities as of the end of 2014). Over the same period, the number of census blocks in which the ILECs provide fiber-based internet access services has grown from 61 to 810, or by a factor of about 13.

**Table 5: Time Series of Census Blocks  
With Sonic and ILEC Fiber Facilities  
(2014-2016)**

	Dec 2014	Jun 2015	Dec 2015	Jun 2016	Dec 2016
Sonic Fiber Only	0	25	184	1,009	1,237
ILEC Fiber Only	28	61	81	35	810
Sonic + ILEC Fiber	0	0	5	73	100
<b>Total ILEC + Sonic Fiber</b>	<b>28</b>	<b>86</b>	<b>270</b>	<b>1,117</b>	<b>2,147</b>

Notes and sources: FCC Form 477 data, December 2014 v2, June 2015 v3, December 2015 v2, June 2016 v2, December 2016 v1. Analysis by The Brattle Group.

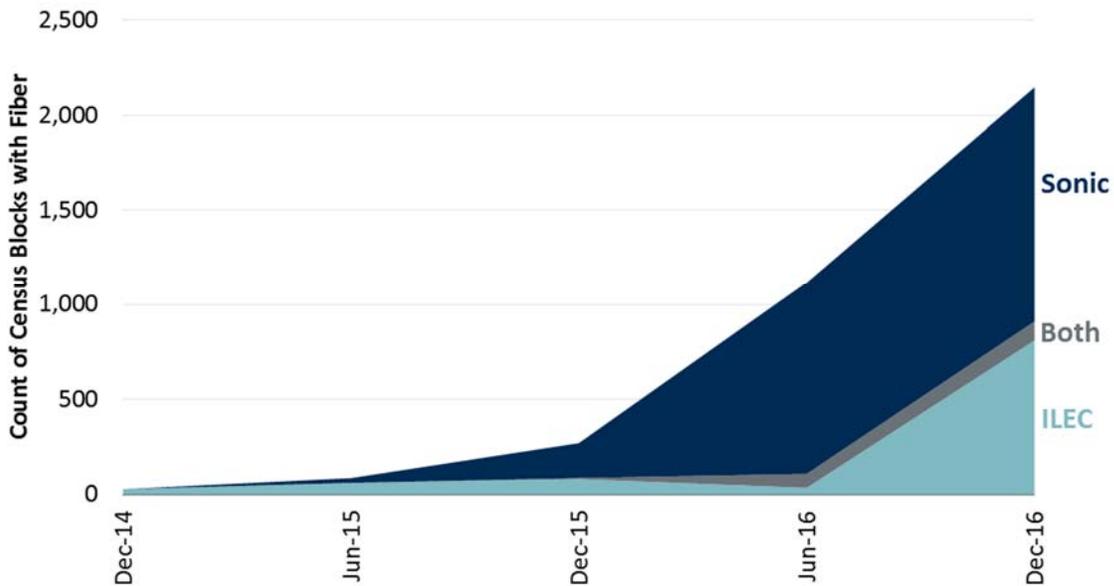
14. Table 5 shows since the end of 2015, Sonic has had more fiber facilities in place (in terms of the number of census blocks where it provides services) than the ILECs do. As of the end of 2016, the ILEC has deployed fiber facilities in 910 of the subject census blocks, while Sonic has deployed fiber in 1,337 census blocks.
15. Figure 1 shows the extent to which Sonic’s fiber network has grown (in terms of number of census blocks reached). There are few areas of overlap in the deployment of fiber facilities: at the end of 2016, Sonic and the ILEC had fiber facilities in only 100 of the same census blocks, or 7% of the census blocks where ILEC or Sonic fiber facilities were present (see also Table 5). The figure shows a sharp increase in the ILEC fiber build-out in

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<sup>11</sup> This is the timeframe covered by historical FCC 477 datasets publicly available at the time of filing (<https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477>). It does not include subsequently deployed fiber; Sonic has deployed substantial additional fiber since December 2016. Sonic Decl. ¶ 9.

2016, which may at least in part be a response to Sonic’s ongoing fiber build-out, and suggests that ILECs are following Sonic in a race to deploy fiber in these census blocks.

**Figure 1: Sonic vs. ILEC Deployment of Fiber in Census Blocks where Sonic Operates (2014-2016)**



Notes and sources: FCC Form 477 data, December 2014 v2, July 2015 v2, December 2015 v2, July 2016 v2, December 2016 v1. Analysis by The Brattle Group.

16. Sonic has been able to expand its fiber network because UNEs were available as a stepping stone. It is well known that the economics of broadband networks require some assurance of a customer and revenue base. Unlike the ILECs which built out their networks as monopoly providers under a rate of return regulatory regime, few if any competitive operators – including ILECs with respect to markets outside of their footprint – can afford to build-out networks on a fully speculative basis.<sup>12</sup> Analysis provided to the FCC as part of the BDS proceeding made it clear that a CLECs cannot profitably build-out their own networks unless there is sufficient density and it can gain sufficient market share to cover

<sup>12</sup> See M. Rysman, “Empirics of Business Data Service,” WC Docket Nos 05-25, 13-5, 16-143 at 11-12 (Rev. June 2016) (only 7% of buildings were served by ILEC-affiliated CLECs on a full facilities basis), available at: <https://docs.fcc.gov/public/attachments/DOC-340040A6.pdf>.

costs.<sup>13</sup> CLECs like Sonic have used UNEs to gradually develop their market shares to a level which enables them to justify funding the build-out of their own networks.

17. These data support the CLECs' observations concerning the important role that UNEs play in building their own fiber networks. The presence of a third facilities-based competitor in 1,307 census blocks (see Table 1) would almost certainly not have happened if not for the availability of UNEs. For Sonic, UNEs served to effectively lower the barriers to entering facilities-based competition, and advanced the FCC's objectives of enhancing investment in broadband networks.
18. In addition, as highlighted in Professor Sappington's declaration, reliance on UNE-based services is not a viable long-term option for CLECs like Sonic – if they want to remain in business. Under existing rules, ILECs will eventually upgrade their networks to fiber and retire their copper-based networks, at least in geographic areas with moderate population densities, which will mean that bare copper UNEs will not be available for CLECs to lease indefinitely. Furthermore, the presence of fast fiber-based internet access service will make DSL-based services much less attractive to customers. As Professor Sappington has indicated, for these reasons “CLECs cannot view UNEs as a long-term substitute for their own fiber investment. Instead, they must view UNEs as a transitional means to reduce the risk associated with investment in their own fiber network.”<sup>14</sup>

**IV. CLECs are providing faster broadband speeds over the ILEC's copper network than the ILECs are themselves. In the absence of UNEs, customers either might not have access to or would have to pay much more for comparable products.**

19. As indicated above, ILECs use their copper network to provide DSL in the vast majority of the 20,266 census blocks under study. DSL bandwidth speeds are determined, in part, by the equipment which is attached to the copper line over which the DSL operates. Sonic has

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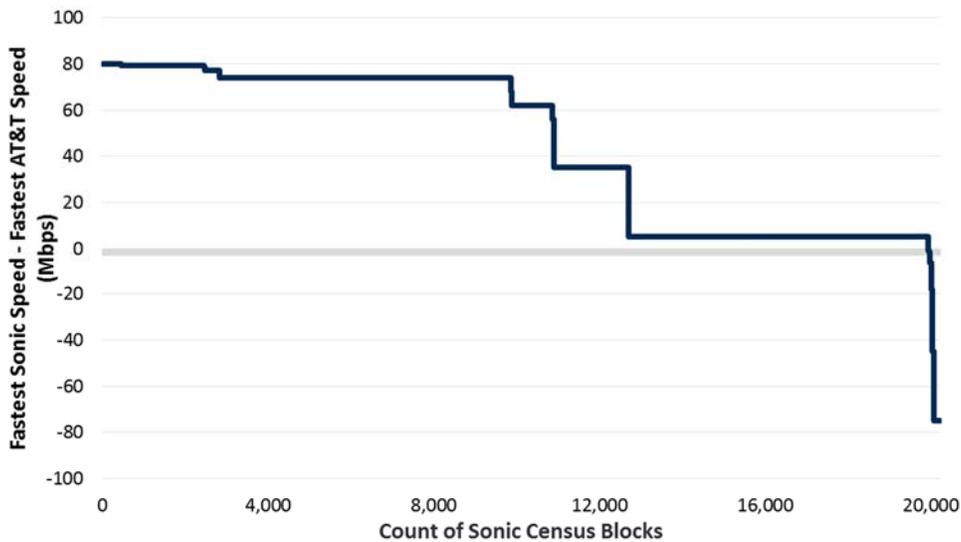
<sup>13</sup> CostQuest, Analysis of Fiber Deployment Economics for Efficient Provision of Competitive Service to Business Locations, Attachment A to Letter from Jennie Chandra, Windstream Corporation, to Marlene H. Dortch, Secretary, FCC, GN Docket Nos. 13-5 & 12-353, WC Docket Nos. 05-25 and 15-1, and RM-10593 (filed June 8, 2015).

<sup>14</sup> Sappington at 16.

demonstrated faster internet speeds than the ILECs have, in the same census blocks and over the same ILEC copper-based network.

20. We used FCC Form 477 data to compare the internet access speeds advertised by Sonic and by AT&T (the main ILEC in Sonic’s service territory) for the census blocks in which Sonic operates.<sup>15</sup> Figure 2 makes the comparison between the fastest products available from each provider in each of the 20,266 census blocks. The figure shows the difference between internet access speeds offered by Sonic and AT&T, ranked by magnitude of the difference. Positive differences indicate that Sonic’s maximum advertised product speed is faster than AT&T’s, while negative differences indicate that Sonic’s maximum advertised speed is slower.

**Figure 2: Speed of Fastest Advertised Sonic UNE DS0 Product vs. Fastest Advertised ILEC (AT&T) Product Alternative**



Notes and sources: Internet access service speeds are for the highest advertised available speed product from each provider by census block, over copper wire or via UNEs. Data from FCC Form 477, December 2016 v1. Analysis by The Brattle Group.

21. As indicated in the figure, Sonic’s advertised product speed is faster than AT&T’s advertised speeds in nearly all census blocks, with a difference of more than 5 Mbps in

<sup>15</sup> Actual speeds to which individual customers subscribe may be different than the advertised and available speeds.

approximately 63% of census blocks. Sonic explained that its product speed advantage results from the use of “bonded pairs”<sup>16</sup> as well as its deployment of faster DSL technologies.<sup>17</sup> Also, Sonic has represented that in some cases its product speeds as shown in the FCC’s data may understate the actual speeds delivered to customers.

22. Sonic has also been able to provide its DSL broadband services at lower prices than AT&T. Eliminating the current UNE pricing regime would almost certainly result in an increase in the prices that Sonic would have to pay to lease these circuits. Sonic currently pays roughly \$11.67 per line per month to lease UNE DS0s to provide its Sonic Fusion product to customers and two times this amount (\$23.34) for bonded pairs. Sonic indicated that its next best option, if UNEs were unavailable, would be under commercial wholesale arrangements through the AT&T Partner Exchange (APEX),<sup>18</sup> which would cost **\*\*\*BEGIN CONFIDENTIAL [REDACTED] END CONFIDENTIAL\*\*\***.<sup>19</sup>
23. The increase in costs under the APEX arrangements would account for roughly **\*\*\*BEGIN CONFIDENTIAL [REDACTED] END CONFIDENTIAL\*\*\*** of Sonic’s current prices for the majority of its customers.<sup>20</sup> Sonic would have to pass these costs onto its customers, absorb some or all of this cost increase (thereby significantly reducing its margins), or both. Such an increase in costs could effectively dismantle leasing as a stepping stone and impede the deployment of CLEC fiber networks – either by driving customers away from Sonic or by reducing Sonic’s cash flow and ability to fund network investments. Under either case, consumers would be harmed.

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<sup>16</sup> Pair-bonded service uses two copper UNEs to the premise, which serves to double the speed of the broadband connection.

<sup>17</sup> Sonic represented that its faster DSL speeds are also the result of its use of VDSL2 in all central office locations, and its use of ADSL2+ as a fallback when longer reach is needed. Sonic Decl. ¶ 4.

<sup>18</sup> AT&T’s wholesale product is AT&T Internet Access, available under a platform referred to as the AT&T Partner Exchange (APEX).

<sup>19</sup> UNE DS0 rates and estimated replacement AT&T wholesale product prices were provided by Sonic.

<sup>20</sup> Sonic represented that it currently charges residential customers between \$50 and \$70 per month. That is, \$50 per month for its most popular “Fusion” service, plus \$20 per month for faster speeds with pair bonded service. Sonic Decl. ¶ 3. The percentage of cost increases relative to Sonic prices would be less for the **\*\*\*BEGIN CONFIDENTIAL [REDACTED] END CONFIDENTIAL\*\*\*** of Sonic customers that receive service over bonded pairs.

**REDACTED – FOR PUBLIC INSPECTION**

I declare the foregoing to be true and correct to the best of my knowledge, under penalty of perjury.

  
William P. Zarakas

08/06/18  
Date

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**William P. Zarakas** is a Principal with The Brattle Group, an economics consulting firm, and an expert on economic, strategic and regulatory matters involving the energy, telecommunications and media industries. His main area of work and research involves the economics of infrastructure deployment and network development, market and competitive analysis and the alignment of regulatory frameworks with policy goals and business models. Mr. Zarakas has also led the Brattle team in analyzing the competitive and economic impacts of recent telecom and media mergers, has conducted valuations of telecom businesses and spectrum, and estimated royalties and retransmission fees in the cable and satellite television industries. He also heads Brattle’s retail energy practice, which covers Brattle's work in aligning evolving utility business, and regulatory frameworks and performance based regulation.

Mr. Zarakas has provided testimony and expert reports before the Federal Communications Commission, the Federal Energy Regulatory Commission, the Securities and Exchange Commission, the Copyright Royalty Judges (Library of Congress), the U.S. Congress, state regulatory agencies, arbitration panels, foreign governments and courts of law. He has led (and authored reports concerning) special investigations on behalf of corporate boards of directors and audits of management practices and operational and financial performance on behalf of regulatory commissions. He holds an M.A. in economics from New York University and a B.A., also in economics, from the State University of New York.

**Broadband Modeling and Business Planning**

- Developed and authored report concerning the costs of deploying wireless broadband in rural areas. Before The Federal Communications Commission In The Matter Of Connect America Fund and Universal Service Reform – Mobility Fund. WC Docket No. 10-90 and WT Docket No. 10-208A. (February 2013, and updated analysis May 2016).
- Directed comprehensive financial analysis for a U.S .national broadband provider including: developing projections of demand, price elasticities, revenue and capital and operating costs, and pricing points.
- Performed comprehensive business case analysis of entry into the broadband market (including voice, internet access and video services) on behalf of a major U.S. electric utility. Scope of work included technology assessment and detailed financial modeling. Work included customer and geographic segmentation, pricing scenarios and elasticity analysis.
- Led comprehensive financial analysis concerning the deployment of a broadband communications network for an Asian electric utility. Related work included assessing transfer pricing methodologies regarding the use of utility assets, resources and easements by the broadband affiliate.

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- Directed and led analysis of business diversification for multiple electric utilities. Business opportunities analyzed included dark fiber construction and third party use of utility poles, towers and conduit. Scope of analysis included financial modeling and transfer pricing.

**Competition Analysis**

- Directed comprehensive analysis and provided testimony concerning market shares, vertical foreclosure and Nash bargaining in the Application of Comcast Corporation, General Electric Company and NBC Universal, Inc. for Comcast to Assign or Transfer Control of Licenses, Before the Federal Communications Commission, MB Docket No. 10-56. (December 2014 and March 2015).
- Led analysis and provided testimony concerning the merger of TECO Energy, New Mexico Gas Company, and Continental Energy Systems, Before the Public Regulation Commission Utility Case No. 13-00231-UT (March 2014).
- Directed analysis and authored report regarding the effects of changes in regulatory fees and taxes on mobile prices, penetration and the macro economies of 22 countries in the Middle East and Africa. Study, conducted on behalf of a major mobile operator, involved detailed analysis of the relationships between marginal cost and prices, market structure and concentration, and empirical relationships concerning mobile penetration and GDP.
- Led analysis and authored expert reports concerning prospective merger savings and divestiture losses for electric and gas utilities. Scope of work included analyses involved in determining the operating and capital impacts of mergers under multiple scenarios, and also involved the anticipated economic inefficiencies resulting from forced divestiture. Reports authored included studies of merger efficiencies and reports concerning Economic Loss Studies included in U-1 filings before the U.S. Securities and Exchange Commission. Economic Loss Studies are required under PUHCA Section 11 (b) (1) Clauses A, B, and C when utility merger results in the establishment of a registered holding company with electric and gas businesses. Work in these areas included detailed analyses of current and hypothetical future electric and gas utility operations.

**Spectrum Valuations**

- Conducted analyses and authored expert report estimating value of Mobile Satellite Service (MSS) spectrum (i.e., the 2 GHz Band from 2000-2020 MHz and 2180-2200 MHz, the Big LEO from 1610-1626.5 MHz and 2483.5-2500 MHz, and the L-band from 1525-1559 MHz and 1626.5-1660.5 MHz) in several matters, including matters involving the Terrestar

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bankruptcy. Analyses included impact of incorporating FCC authorized ancillary terrestrial component (ATC) into MSS mobile broadband networks.

- Analyzed spectrum values in the 2.3 and 2.5 GHz bands for the U.S. market.
- Analyzed value of Advanced Wireless Services (AWS; 1.7 / 2.1 GHz) band for the U.S. market.
- Analyzed value of unpaired 2.1 GHz spectrum for the U.S. market.
- Analyzed value of 2.3 GHz (WCS) 3.5 GHz (FWA) spectrum in Canadian market.
- Authored report concerning market comparable analysis of U.S. PCS market.
- Provided expert testimony concerning potential value of wireless spectrum in the 700 MHz band.
- Analyzed value of Specialized Mobile Radio (SMR) and Private Land Mobile Radio Services (PLMRS) spectrum on behalf of utility operating companies in the U.S. market.
- Analyzed value of narrowband PCS and IVDS spectrum portfolio.
- Directed, led analysis and authored report concerning valuations of wireless spectrum in the Middle East-North African (MENA) region for an international wireless operator.
- Directed, led analysis and authored report concerning impact of additional wireless operators on spectrum values for the telecommunications regulator in the Kingdom of Jordan.

**Utility Business Models and Investment Analysis**

- Advised New York’s Reforming the Energy Vision (REV) architects (i.e., the NYPSC chair and NYSEDA leads) on implementation and utility transformation issues. Led comprehensive modeling and scenario analysis concerning the impact of distributed energy resources (DERs) on utility sales, revenues, capital and operating cost structures and financing, and on utility rate base and customer rates and bills. Project also involved developing scenarios for energy and related service based transactions occurring over a utility platform and the most appropriate scope of a platform in the near term.
- Modeled and advised New York’s six investor owned utilities on matters relating to regulatory incentive structures. The New York REV created earnings adjustment mechanisms (EAMs) intended to provide a bridge from the traditional regulatory model to a (still evolving) next generation model. The State’s utilities are responsible for specifying the new EAMs. Brattle worked with the utilities to design EAMs and also conducted scenario

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analysis that projected likely outcomes in key REV areas (e.g., peak reduction, asset utilization and integration of DERs).

- Led strategic analysis of next generation (i.e., utility of the future) regulatory frameworks for a Midwestern electric utility. Specifically, Brattle was asked to opine on the future of utility platforms (highly transactive two-sided markets vs. less transactive / more informational) recommend the appropriate regulatory framework for the near to intermediate term. Brattle's analysis included a review of DER feasibilities and transactive platform requirements. It also included a comprehensive assessment of regulatory incentive frameworks, including performance based regulation and the U.K.'s RIIO model.
- Led system reliability and resilience investment analysis for a large combination electric and gas utility. Customer concern (and political pressure) following a series of weather-induced large scale and long duration outages led to the utility developing an extensive and relatively expensive resilience investment program. Brattle advised the company on benefits and costs, and employed a value of lost load (VOLL) methodology to estimate customer willingness to pay for higher reliability in extreme circumstances. The company modified the scope of its investment program accordingly. Brattle analysis and reports were also included in the company's regulatory filings. (Public Service Electric & Gas (PSE&G) in NJ BPU Docket No. EO13020155 and GO13020156)
- Advised board of trustees and executive management on strategic and organizational direction for the Long Island Power Authority (LIPA). LIPA assumed a municipal corporate structure following the decommissioning of a nuclear power plant. The utility had among the highest rates in the U.S. and the lowest customer approval ratings. Brattle was retained to advise the utility and the Governor's office on ways to improve cost structure (e.g., through privatization, municipalization and outsourced management services arrangements) and ways to better understand and meet customer needs (e.g., community energy programs and resilience improvements). Options were evaluated based on rate impacts and risk factors, including risks associated with organizational transformation. Project required extensive modeling of LIPA operations and financing scenarios, as well as analysis of power and transmission markets.
- Advised board of directors of a major generation and transmission (G&T) cooperative and its member electric distribution cooperatives on matters concerning: asset valuations, risk management strategy, merger and acquisition options, and outlook for retail electric markets.

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Cost, Rate and Incentive Analyses

- Led analysis and authored report and testimony concerning the specifications, targets and incentive structure for performance regulatory measures for use by the Hawaiian Electric Companies. Before the Public Utilities Commission of the State of Hawaii, In The Matter of Public Utilities Commission Instituting an Investigation to Reexamine the Existing Decoupling Mechanisms Docket No. 2013-104. September 15, 2014
- Led analysis and authored report and testimony concerning incentive regulatory frameworks and targeted performance incentives for electric and natural gas utilities in Massachusetts. Massachusetts D.P.U. 12-120. March 2013.
- Led and authored report concerning comprehensive analysis of approaches to setting electric distribution reliability standards on behalf of the Australian Energy Market Commission (AEMC).
- Directed and provided expert testimony on price cap frameworks and productivity analysis applied to telecommunications business data services (BDS, previously referred to as special access) in proceedings before the U.S. Federal Communications Commission. WC Docket No. 16-143, WC Docket No. 15-247, WC Docket No. 05-25, RM-10593.
- Directed and provided testimony concerning pole Attachment rates in Virginia Cable Telecommunications Association v. Virginia Electric and Power (December 21, 2001) and FCC Docket No. 15-90, File No. EB-15-MD-006 (November 18, 2015).
- Analyzed costs and value of retransmitted television programming in cable and satellite video markets and determined distribution of copyright royalty fees among content providers. Authored expert report Before The Copyright Royalty Judges, Library of Congress, Washington D.C. In The Matter of Distribution of the 2004 and 2005 Cable Royalty Funds, Docket No. 2007-3 CRB CD 2004-20. June 1, 2009
- Directed comprehensive modeling and analysis and provided testimony in multiple U.S. state regulatory proceedings concerning analysis of rates for unbundled network elements (UNEs), undertaken in fulfillment of requirements associated with the Telecommunications Act of 1996, using the Total Element Long Run Incremental Cost (TELRIC) methodology.
- Led analysis and provided testimony concerning incentive systems to be applied to incumbent local exchange telephone carriers (ILECs) on behalf of the New York State Department of Public Service; involved modeling determining total factor productivity (TFP)

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based on empirical analysis and consideration of projected performance improvement initiatives.

- Conducted cost-of-service and marginal cost analyses for an international broadband company spanning the U.S., European and Asian markets.
- Directed cost of service and feasibility analysis for a municipality planning on deploying a broadband Wi-Fi network.
- Directed analysis and authored white paper on empirical analysis concerning the impact of changing the price of wholesale access and levels of investment in the U.S. telecommunications market. Results reported in white paper entitled: “Structural Simulation of Facility Sharing: Unbundling Policies and Investment Strategy in Local Exchange Markets.”

**Arbitration, Special Investigations and Commercial Litigation**

- International Arbitration (satellite communications): Authored expert report concerning the impact of an alleged breach of contract on lost profits in a 23 country business operation concerning a satellite communications business. Performed detailed financial modeling to determine revenues, net income and net present value using risk adjusted discount rates for a satellite service provider.
- Forensic Analysis and Special Investigation: Directed consulting team and authored report for the forensic analysis of the economics, financial reporting and accounting associated with allegation of accounting and financial improprieties by Global Crossing. Worked on behalf of the Special Committee on Accounting Matters composed of a subset of (and reporting to) the Board of Directors of Global Crossing Ltd. Analysis involved determination of basis for revenue recognition for concurrent (i.e., “swap”) transactions. Analysis included in report by the Special Committee entitled “The Concurrent Exchange of Fiber Optic Capacity and Services Between Global Crossing and its Carrier Customers.” January 2003.
- Commercial Litigation: Directed expert consulting team in litigation matter concerning the deployment schedule of bandwidth on a major undersea cable project. Case involved allegations of breach of contract. Case work involved modeling of undersea fiber optic bandwidth in major undersea crossings and financial analysis of project viability.
- Forensic Analysis and Securities Litigation: Directed consulting team and led technical analysis concerning accounting and financial disclosure on behalf of the defendant in a class action against corporate officers, directors, controlling shareholders and the company’s

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outside auditors alleging violations of the Securities Act of 1993 and the Securities Exchange Act of 1934. Scope of case involved accounting and disclosure treatment of complex leases.

- Special Investigations and Audits: Directed project teams, led technical analysis and authored reports in multiple special investigations and audits of management, operations and finance and accounting on behalf of regulatory utility commissions. Special investigations and audits involved allegations of improper cross subsidization and/or transfer pricing practices by regulated utilities (telecommunications, electric and/or natural gas) and their effect on rates charged to consumers. Special investigations and audits were conducted for regulatory commissions in Alabama, Kentucky, Maryland, New York and Pennsylvania.
- Commercial Litigation (broadband communications): Provided expert testimony concerning the estimate of commercial damages stemming from an alleged breach of contract associated with relocating infrastructure assets. Public Service Company of New Mexico vs. Smith Bagley, Inc. and Lite Wave Communications LLC In The United States District Court For The District of New Mexico. March 2007.
- Commercial Litigation (wireline communications): Developed analysis and supported expert testimony concerning damages associated with cable breaks and disruption of wholesale transport services. Analysis involved estimating lost profits and determining replacement cost of temporarily lost capacity. MCI WorldCom Network Services, Inc. v. MasTec, Inc. before the United States District Court Southern District of Florida, Case No. 01-2059-CIV-GOLD. May 2002.

## TESTIMONY

Declaration of William Zarakas and Eliana Garces In the Matter of beIN Sports, LLC, Complainant, v. Comcast Cable Communications, LLC and Comcast Corporation, Defendants, MB Docket No. 18-90.

Declaration (August 7, 2017) and Reply Declaration (August 29, 2017) of William P. Zarakas and Jeremy A. Verlinda Before the Federal Communications Commission In the Matter of Tribune Media Company (Transferor) and Sinclair Broadcast Group, Inc. (Transferee), Consolidated Applications for Consent to Transfer Control, MB Docket No. 17-179

Declaration of William P. Zarakas Before the Federal Communications Commission In the Matter of Business Data Services in an Internet Protocol Environment, Investigation of Certain Price Cap Local Exchange Carrier Business Data Services Tariff Pricing Plans, 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, WC Docket No. 16-143, WC Docket No. 15-247, WC Docket No. 05-25, RM-10593. Declaration of William P. Zarakas and Susan M. Gately

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(January 27, 2016); Supplemental Declaration of William P. Zarakas (March 24, 2016); Declaration of William P. Zarakas and Jeremy Verlinda (June 28, 2016, Attachment D to Comments of Sprint Corporation); Declaration of David E. M. Sappington and William P. Zarakas (June 28, 2016, Attachment E to Comments of Sprint Corporation); Further Supplemental Declaration of William P. Zarakas (August 9, 2016, Attachment A of Reply Comments of Sprint Corporation).

Declaration of William P. Zarakas Before the Federal Communications Commission In the Matter of Verizon Virginia. LLC and Verizon South, Inc., Complainants, v. Virginia Electric and Power Company d/b/a Dominion Virginia Power, Docket No. 15-90, File No. EB-15-MD-006 (November 18, 2015).

Declaration of William P. Zarakas and Matthew Aharonian (May 22, 2015) in the United States Court for the District of Columbia Circuit United States Telecom Association, Petitioner, v. Federal Communications Commission and the United States of America, Respondents, Case No. 15-1063 (and consolidated cases).

Declarations Before the Before the Federal Communications Commission In the Matter of Application of Comcast Corporation, General Electric Company and NBC Universal, Inc. for Comcast to Assign or Transfer Control of Licenses, Federal Communications Commission, MB Docket No. 10-56. Analysis of the FCC’s Vertical Foreclosure and Nash Bargaining Models Applied To The Proposed Comcast-Time Warner Cable Transaction (December 21, 2014) and Supplemental Declaration: Analysis of the FCC’s Vertical Foreclosure and Nash Bargaining Models Applied To The Proposed Comcast-Time Warner Cable Transaction (March 5, 2015).

Before the Public Utilities Commission of the State of Hawaii, In The Matter of Public Utilities Commission Instituting an Investigation to Reexamine the Existing Decoupling Mechanisms for Hawaiian Electric Company, Inc., Hawaii Electric Light Company, Inc., and Maui Electric Company, Limited, Docket No. 2013-1041, On Behalf of the Hawaiian Electric Companies. Report: “Targeted Performance Incentives: Recommendations to the Hawaiian Electric Companies,” Prepared For The Hawaiian Electric Companies, William P. Zarakas and Philip Q Hanser, September 15, 2014.

Before the New Mexico Public Regulatory Commission, In The Matter Of The Application of TECO Energy, Inc., New Mexico Gas Company, Inc. and Continental Energy Systems, LLC, For Approval of TECO Energy Inc.’s Acquisition of New Mexico Gas Intermediate, Inc. and For All Other Approvals and Authorizations Required To Consummate and Implement The Acquisition, Utility Case No. 13-00231-UT, On Behalf of TECO Energy, Inc., New Mexico Gas Company, Inc. and Continental Energy Systems, LLC, Joint Applicants. March 2014.

Before the New Jersey Board of Public Utilities In the Matter of the Petition of Public Service Electric and Gas Company for Approval of the Energy Strong Program, expert report, “Analysis of Benefits: PSE&G’s Energy Strong Program,” by Peter Fox-Penner and William P. Zarakas. NJ BPU Docket No. EO13020155 and GO13020156. October 7, 2013.

“Review and Analysis of Service Quality Plan Structure In The Massachusetts Department of Public Utilities Investigation Regarding Service Quality Guidelines For Electric Distribution Companies and

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"Alaska Mobile Broadband Cost Model, Before The Federal Communications Commission In The Matter Of Connect America Fund and Universal Service Reform – Mobility Fund. WC Docket No. 10-90 and WT Docket No. 10-208A." William P. Zarakas and Giulia McHenry, February 2013

Expert Report of William P. Zarakas In The United States District Court For The Northern District of Florida MCI Communications Services, Inc., Plaintiff v. Murphree Bridge Corporation, Defendant, Case No. 5:09-cv-337, February 19, 2010.

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Expert report provided in Public Service Company of New Mexico vs. Smith Bagley, Inc. and Lite Wave Communications LLC In The United States District Court For The District of New Mexico. March 2007.

Expert report entitled “Comparative Market Value Analysis of Upper 700 MHz Public Safety Spectrum” in FCC WT Docket no. 96-86 (In the Matter of The Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010). June 2006.

Expert report entitled “Analysis of Potential Lost Profits Associated With The Alleged Breach of Contract Between Orbcomm and Orbcomm Asia Limited” before the American Arbitration Association. May 2006.

Direct testimony before the Federal Communications Commission in the matter of *Petition of ACS of Anchorage, Inc. Pursuant to Section 10 of the Communications Act of 1934, as amended, for Forbearance from Sections 251(c)(3) and 251(d)(1) In the Anchorage LEC Study Area*, WC Docket No. 05-281, January 9, 2006.

Expert report co-authored with Dorothy Robyn Before the U.S. House of Representatives Committee on Energy and Commerce and the U.S. Senate Committee on Commerce, Science and Transportation regarding the value of wireless spectrum in the 700 MHz band. Letters, May 18, 2005.

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Direct and rebuttal testimony before the Federal Communications Commission in the matter of *Virginia Cable Telecommunications Association v. Virginia Electric and Power Company, d/b/a Dominion Virginia Power and Dominion North Carolina Power*, PA No. 01-005, December 21, 2001.

Expert report Before the U.S. Securities and Exchange Commission included in Form U-1 Application/ Declaration Under The Public Utility Holding Company Act of 1935 in the combination of Energy East Corporation with RGS Energy Group, Inc. (June 20, 2001) in Exhibit J-1, entitled “Analysis Of The Economic Impact Of A Divestiture Of The Gas Operations Of Rochester Gas And Electric Corporation,” May 15, 2001.

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Rebuttal Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the North Carolina Utilities Commission, Docket No. P-100, SUB 133D, Filed March 9, 1998; *In Re: Proceeding to Determine Permanent Pricing for Unbundled Network Elements*.

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Rebuttal Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the South Carolina Public Service Commission, Docket No. 97-374-C, Filed November 25, 1997; *In Re: Proceeding to Review BellSouth Telecommunications, Inc.’s Cost Studies for Unbundled Network Elements*.

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Direct Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the South Carolina Public Service Commission, Docket No. 97-374-C, Filed November 3, 1997; *In Re: Proceeding to Review BellSouth Telecommunications, Inc.’s Cost Studies for Unbundled Network Elements*.

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Rebuttal Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Tennessee Regulatory Authority, Docket No. 97-01262, Filed October 17, 1997; *In Re: Contested Cost Proceeding to Establish Final Cost Based Rates for Interconnection and Unbundled Network Elements.*

Direct Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Tennessee Regulatory Authority, Docket No. 97-01262, Filed October 10, 1997; *In Re: Contested Cost Proceeding to Establish Final Cost Based Rates for Interconnection and Unbundled Network Elements.*

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Rebuttal Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Georgia Public Service Commission, Docket No. 7061-U, Filed September 8, 1997; *In Re: Review of Cost Studies, Methodologies and Cost-Based Rates for Interconnection and Unbundling of BellSouth Telecommunications Services.*

Rebuttal Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Louisiana Public Service Commission, Docket Nos. U-22022/22093, Filed September 5, 1997; *In Re: Review of Consideration of BellSouth Telecommunications, Inc.'s TSLRIC and LRIC Cost Studies to Determine Cost of Interconnection Services and Unbundled Network Components, to Establish Reasonable, Non-Discriminatory, Cost-Based Tariff Rates.*

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Direct and rebuttal testimony Before the Virginia State Corporation Commission on behalf of United Telephone - Southeast, Inc. and Centel Corporation, May 1994.

Direct and rebuttal testimony Before the Tennessee Public Service Commission on behalf of United Telephone - Southeast, Inc., Docket No. 93-04818, January 28, 1994.

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PAPERS AND PUBLICATIONS

“Two-sided Markets and the Utility of the Future: How Services and Transactions Can Shape the Utility Platform,” by William P. Zarakas, *The Electricity Journal*, Volume 30 (2017) 43-46.

“DER Incentive Mechanisms as a Bridge to the Utility of the Future,” by William P. Zarakas, Frank C. Graves and Heidi Bishop, presented at SNL Knowledge Center’s Energy Utility Regulation Conference: Strategies for Profit and Reliability, December 14, 2016.

“Electric Utility Services and Evolving Platforms in the Mid-Atlantic Region,” by William Zarakas, presented at the Mid-Atlantic Conference of Regulatory Utilities Commissioners (MACRUC) 20th Annual Education Conference, Williamsburg, VA, June 23, 2015.

“Growth Prospects and Shifting Electric Utility Business Models: Retail, Wholesale and Telecom Markets,” by William P. Zarakas, *The Electricity Journal*, Volume 28, Issue 5, June 2015.

“Do We Need a New Way to Regulate Electric Utilities?,” by William P. Zarakas, presented at the Energy Bar Association 2015 Annual Meeting, Washington, DC, May 6, 2015.

“Investing In Electric Reliability and Resiliency,” by William P. Zarakas, presented at the NARUC 2014 Summer Meeting - Joint Electricity and Critical Infrastructure Committees, Dallas, TX, July 15, 2014.

“Utility Investments in Resiliency: Balancing Benefits with Cost in an Uncertain Environment,” by William P. Zarakas, Sanem Sergici, Heidi Bishop, Jake Zahniser-Word and Peter S. Fox-Penner, *The Electricity Journal*, Volume 27, Issue 5, June 2014.

“Infrastructure and Competition in the Electric Delivery System,” by William P. Zarakas, *The Electricity Journal*, Volume 26, Issue 7, September 2013.

“Low Voltage Resiliency Insurance, Portable small-scale generators could keep vital services on line during a major power outages,” by William Zarakas, Frank Graves, and Sanem Sergici, forthcoming *Public Utilities Fortnightly* September 2013.

“Finding the Balance Between Reliability and Cost: How Much Risk Should Consumers Bear?,” by William P. Zarakas and Johannes P. Pfeifenberger, presented at the Western Conference of Public Service Commissioners, Santa Fe, NM, June 3, 2013

“The Utility of the Future: Distributed or Not?,” by William P. Zarakas, presented at Advanced Energy 2013, New York, NY, April 30, 2013

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"Rates, Reliability, and Region," by William P. Zarakas, Philip Q Hanser, and Kent Diep, *Public Utilities Fortnightly*, January 2013

"Approaches to Setting Electric Distribution Reliability Standards and Outcomes," by Serena Hesmondhalgh, William P. Zarakas, and Toby Brown, The Brattle Group, Inc., January 2012

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"Structural Simulation of Facility Sharing: Unbundling Policies and Investment Strategy in Local Exchange Markets," White Paper, July 2005 (with Glenn A. Woroch, Lisa V. Wood, Daniel L. McFadden, Nauman Ilias, and Paul C. Liu).

"Betting Against The Odds? Why broadband over power lines (BPL) can't stand alone as a high-speed Internet offering." *Public Utilities Fortnightly*, April 2005, pp. 41-45 (with Kenneth J. Martinian).

"The Impact of the Number of Mobile Operators on Consumer Benefit," White Paper, March 2005 (with Kenneth J. Martinian and Carlos Lapuerta).

"Wholesale Pricing and Local Exchange Competition", *Info*, Volume 6, Number 5, 2004, pp. 318-325 (with Lisa V. Wood and David E. M. Sappington).

"Regulatory Performance Measurement Plans and the Development of Competitive Local Exchange Telecommunications Markets", Working Paper, November 2003 (with David E. M. Sappington, Lisa V. Wood and Glenn A. Woroch).

# **ATTACHMENT 1**

## Premature, Ubiquitous Forbearance Will Harm Consumers

by David E. M. Sappington

### I. Qualifications.

My name is David Sappington. I hold the titles of Eminent Scholar and Director of the Public Policy Research Center, both at the University of Florida. Since earning my Ph.D. in economics from Princeton University in 1980, I have served on the faculties of the University of Michigan and the University of Pennsylvania and on the technical staff of Bell Communications Research. I have also served as the Chief Economist for the Federal Communications Commission and as the President of the Industrial Organization Society. I presently hold positions on the editorial boards of six major journals, including the *Journal of Regulatory Economics*, the *Rand Journal of Economics*, and the *Review of Industrial Organization*.

My research analyzes a broad range of issues in the field of industrial organization, with a focus on the design and implementation of regulatory policy. I have published more than one hundred and fifty articles in leading journals in the profession and have coauthored a book on *Designing Incentive Regulation for the Telecommunications Industry*. My curriculum vitae appears as an attachment to this report.

### II. Purpose and Outline of this Report.

USTelecom (“UST”) has petitioned the U.S. Federal Communications Commission (“the FCC” or “the Commission”) to forbear from applying unbundling, resale, and non-discrimination obligations that ILECs presently face. This report explains why the nationwide forbearance UST seeks is inappropriate and would harm consumers. This report also explains why UST’s justification for the ubiquitous forbearance it seeks is fundamentally flawed. This report further documents the critical error in the economists’ report (“the *Economists’ Report*”)<sup>1</sup> that accompanies UST’s petition for forbearance (“the *UST Petition*”).<sup>2</sup> This critical error completely undermines the credibility of the *Economists’ Report*.

The extent and nature of competition in the provision of communications services varies substantially across the country. Competition is pronounced for certain services in some geographic regions. In contrast, competition is extremely limited, if not entirely non-existent, for particular services in other geographic regions. In order to protect consumers as necessary without impeding beneficial competitive forces, regulatory policy must be tailored to the environment in which it is implemented. The *UST Petition* ignores this fact and fails to acknowledge the wide

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<sup>1</sup> Hal Singer et al., “Assessing the Impact of Forbearance from 251(c)(3) on Consumers, Capital Investment, and Jobs” (May 2018), appended as Appendix B to the UST Petition.

<sup>2</sup> *Petition of USTelecom for Forbearance Pursuant to 47 U.S.C. § 160(c) to Accelerate Investment in Broadband and Next-Generation Networks*, WC Docket No. 18-141 (filed May 4, 2018).

variation in competitive conditions across the nation. Consequently, the petition’s call for nationwide forbearance is inappropriate and misguided. The requested forbearance would harm consumers by limiting competition in the supply of important communications services in many regions.

The *Economists’ Report* shares the same fundamental flaw with the *UST Petition*. The *Economists’ Report*’s failure to account for relevant differences in competitive conditions leads it to adopt highly implausible assumptions that completely undermine the credibility of the report’s conclusions. The report also fails entirely to address the role of resold telecommunications services in promoting competition and delivering benefits to consumers.

The present report explains these conclusions as follows. Section III first describes the widely-varying nature and extent of competition in the provision of communications services in the United States. Section III then identifies UST’s fundamental error in ignoring this variation in competitive conditions. Section III’s review of competitive conditions observes that there are at most two full facilities-based suppliers of key communications services in many geographic regions. Section IV explains why, as the Commission has noted, duopoly competition cannot be relied upon to protect consumers. Section V demonstrates how the nationwide forbearance the UST advocates would harm consumers by fostering monopoly and duopoly industrial structures, thereby limiting price and quality competition and valued service differentiation. Section V also explains how forbearance would harm consumers and impede economic development in the United States by reducing broadband infrastructure investment by both competitive local exchange carriers (“CLECs”) and incumbent local exchange carriers (“ILECs”). Section VI identifies the fundamental flaw in the *Economists’ Report* that totally undermines its credibility. Section VII summarizes the key conclusions of the present report.

### **III. The *UST Petition* is Fundamentally Flawed Because it Fails to Recognize the Highly Varied Nature and Extent of Competition in the Provision of Communications Services.**

#### **A. Competitive Conditions Vary Widely.**

Customers can purchase a broad range of communications services from several facilities-based suppliers in some areas of the United States. For example, companies located in the central business districts of the largest and most densely populated metropolitan areas often can secure a diverse range of voice and data services from the ILEC or from one of several CLECs that serve customers using their own fiber networks.<sup>3</sup>

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<sup>3</sup> As of 2016, approximately one-half of one percent of the U.S. population lived in census blocks where five or more facilities-based suppliers offered high-speed wireline broadband service. (David S. Evans, “Economic Findings Concerning the State of Competition for Wired Broadband Provision to U.S. Households and Edge Providers,” Global Economics Group discussion paper, August 29, 2017, available at <https://ssrn.com/abstract=3029006> (“Evans Report”), Table 2, p. 11.

In contrast, there are many regions in the U.S. where consumers have little or no choice among suppliers of communications services. To illustrate, as of 2013, there was only one full facilities-based supplier of business data services (“BDS”) at 84% of the locations where customers purchase BDS with cumulative bandwidth below 100 Mbps. There were at most two such suppliers in nearly all (more than 99%) of these locations.<sup>4</sup> Even when BDS locations of all bandwidths are considered, ILECs had the sole facilities to 77% of locations, and less than 1% were served by more than two full facilities-based providers.<sup>5</sup>

Industry concentration is less extreme, but often still pronounced, when measured at the level of the census block. As of 2016, less than 23% of the U.S. population lived in census blocks where more than two facilities-based suppliers delivered high-speed broadband service.<sup>6</sup> Approximately 7% of the U.S. population lived in census blocks where no facilities-based supplier offered high-speed wireline broadband service.<sup>7</sup>

In summary, the nature and intensity of competition in the provision of voice and data services varies widely across geographic regions of the United States. Furthermore, there are many regions in which competition among facilities-based suppliers to deliver important communications services is limited.

#### **B. The *UST Petition* Fails to Identify Relevant Geographic Markets.**

The *UST Petition* asserts that the unbundling, resale, and non-discrimination obligations that ILECs presently face “are not necessary to protect competition or consumers” (p. 2). In an attempt to support this assertion, the *UST Petition* presents some statistics regarding national trends in the provision and consumption of communications services.<sup>8</sup> The petition then cites these statistics in an attempt to support broad, sweeping generalizations like: (i) “The marketplace is indisputably competitive;”<sup>9</sup> (ii) “UNEs today play a very minor and diminishing role in this

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<sup>4</sup> Letter from John T. Nakahata, Counsel to Windstream, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 16-143 et al., at attached table (filed Oct. 21, 2016).

<sup>5</sup> Marc Rysman, “Empirics of Business Data Services,” Revised June 2016 at Table 7, <https://docs.fcc.gov/public/attachments/DOC-340040A6.pdf>.

<sup>6</sup> Evans Report, Table 2, p. 11. This statistic likely overstates the extent of actual competition at particular locations because a supplier that serves any portion of a census block, no matter how small its actual service territory, is effectively counted as serving the entire census block.

<sup>7</sup> *Ibid.*

<sup>8</sup> For example, the *UST Petition* reports UNE loops nationwide (Chart 4, p. 16), non-ILEC lines nationwide (Chart 5, p. 17), and ILEC wholesale lines and non-ILEC resold lines nationwide (Chart 6, p. 18).

<sup>9</sup> *UST Petition*, note 22.

competitive marketplace;”<sup>10</sup> (iii) “The marketplace is irrevocably open to competition;”<sup>11</sup> (iv) “The market is highly competitive.”<sup>12</sup>

The petition’s focus on broad national statistics suggests that UST believes the relevant geographic market is the entire United States of America when assessing the nature and extent of competition in the provision of communications services. This belief is fundamentally incorrect. In fact, relevant geographic markets are far more local.

As the Commission has noted, a relevant geographic market is a region in which “consumers can ‘practically turn for alternative sources,’ and within which providers can reasonably compete.”<sup>13</sup> An individual or business that seeks to secure wireline telecommunications services for use at its residence or business location cannot secure the services from a firm that does not and cannot profitably supply the services to the customer’s residence or place of business. Consequently, the fact that many firms supply a relevant service in one town does not imply that they compete to serve a customer in a different town, or even at different locations within the same town.

The relevant geographic market when assessing the extent to which competition can protect a local customer can be as small as the customer’s premise.<sup>14</sup> This is the region in which the customer in question can practically seek alternative sources of supply. The relevant geographic market may be larger when nearby suppliers can readily expand their networks to deliver relevant services to a customer’s premise. However, the relevant geographic region does not include regions in which suppliers cannot reasonably compete for the customer’s patronage.

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<sup>10</sup> *Ibid*, p. 15.

<sup>11</sup> *Ibid*, p. 26.

<sup>12</sup> *Ibid*, p. 29.

<sup>13</sup> *Business Data Services in an Internet Protocol Environment*, Report and Order, 32 FCC Rcd 3459, 3461, ¶ 39 (2017) (“*BDS Order*”).

<sup>14</sup> The FCC observes that “each customer location constitutes a separate relevant geographic market, given that a customer is unlikely to move in response to a small, but significant and nontransitory increase in the price of the service. [footnote omitted.] For reasons of administrative convenience, the Commission traditionally has aggregated customers facing similar competitive choices.” *Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Phoenix, Arizona Metropolitan Statistical Area*, Memorandum Opinion and Order, 25 FCC Rcd. 8622, 8657 ¶ 64 (2010) (“*Qwest Phoenix Order*”).

**C. Incorrect Geographic Market Definitions Engender Inappropriate Policy Prescriptions.**

A failure to identify relevant geographic markets can give rise to inappropriate policy prescriptions. This fact is readily illustrated by the following simple example. Suppose a territory consists of two geographic regions, labeled region A and region B. Further suppose 19 firms can and do supply the relevant service in region A, whereas only 1 firm can and does supply the service in region B. On average, there are 10 suppliers in each region in this territory, and 10 suppliers may be sufficient to generate strong competitive discipline in any region. However, there is only 1 supplier in region B, and a single supplier that faces no actual or potential competition in this region may be able to raise prices well above cost and thereby harm consumers in the region.

In this setting (and more generally), removing regulatory constraints throughout the territory because there are many competitors in the territory on average will harm consumers in region B. The relaxed regulation will empower the sole supplier in region B to impose monopoly prices on consumers in the region. The appropriate policy here and more generally is to relax regulatory constraints only in regions where competitive discipline alone is sufficient to protect consumers (which is region A in this example).

In the present setting, UST’s failure to identify relevant geographic markets renders its policy prescriptions inapposite. Robust competition for a given product in relevant geographic markets justifies regulatory forbearance for the product in those specific markets. It does not justify the ubiquitous forbearance that UST seeks.

**D. The *UST Petition* Fails to Identify Relevant Product Markets.**

The *UST Petition* does not simply fail to distinguish among relevant geographic markets. The petition also fails to distinguish adequately among relevant product markets. The Commission has noted that it “distinguish[es] product markets by generally looking at whether various services are reasonably interchangeable, with differences in price, quality, and service capability being relevant.”<sup>15</sup>

Many communications services exhibit very different prices, qualities, and service capabilities and are not reasonably interchangeable. Retail voice service typically is not readily interchangeable with retail data service, and wireless data service often is not a good substitute for wireline data service.<sup>16</sup> In addition, the best-efforts broadband service that cable companies

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<sup>15</sup> *BDS Order*, ¶ 19.

<sup>16</sup> *Ibid.* ¶ 37 (stating that fixed wireless service are “at most, a gap filler for special access services providing last-mile access to buildings”); see also *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, 2018 Broadband

typically supply often is not an adequate substitute for high-bandwidth service provided over a dedicated circuit.<sup>17</sup> Furthermore, wholesale products like access to dark fiber that can be employed to transport large quantities of data between ILEC central offices differ in many respects (including price and service capability) from retail products like residential broadband service.

Even retail services that exhibit many common features can fail to be reasonably interchangeable. To illustrate, the fact that certain TDM services continue to function even when electrical power is interrupted make them nearly indispensable to certain suppliers of alarm and monitoring services.<sup>18</sup> This is the case even though non-TDM technologies can deliver nearly identical communications services when they are operating, but do not operate when the electrical power is interrupted.

**E. Incorrect Product Market Definitions Promote Inappropriate Policy Prescriptions.**

When communications services vary in price, quality, and service capabilities, even intense competition in the provision of one service can fail to protect consumers of other services. To illustrate this more general conclusion, suppose that several suppliers compete to deliver basic voice service in a given geographic region, but the ILEC is the sole facilities-based supplier of high-speed dedicated broadband service in the region. In such a setting, competition may ensure relatively low prices and high levels of service quality for basic voice service. However, competition is unlikely to effectively constrain the price of the dedicated broadband service or ensure it is delivered with high quality.

In this setting and more generally, when assessing the impact of forbearance on competition and thus on consumer welfare, it is imperative to do so on a product-by-product basis. Forbearance might not harm consumers of basic voice service in the present example if several of the suppliers can deliver the service without using UNEs or resold services. In contrast, forbearance may impose substantial harm on consumers of high-speed broadband service by undermining the ability of CLECs to employ UNEs to deliver the service.

CLECs can employ UNEs and resold services to deliver communications services in direct competition with ILECs, thereby constraining the retail prices that ILECs charge and spurring the ILECs to improve their service quality. CLECs can also employ UNEs and resold services to

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Deployment Report, FCC 18-10, ¶ 18 (rel. Feb. 2, 2018) (“[W]e disagree with those that argue that mobile services are currently full substitutes for fixed services.”).

<sup>17</sup> *BDS Order*, ¶¶ 190-196 (discussing why “Best Efforts and Business Data Services Are Not in the Same Product Market”).

<sup>18</sup> *See*, for example, Declaration of Larry Antonellis, ¶¶ 15, 18, Attachment A to Opposition of Granite Telecommunications, LLC, WC Docket No. 18-141 (filed Aug. 6, 2018) (“Declaration of Larry Antonellis”); *see also*, Declaration of Russell Shipley ¶ 35, attached as Exhibit 1 to Opposition of U.S. TelePacific Corp., WC Docket 18-141 (filed Aug. 6, 2018) (“Declaration of Russell Shipley”).

deliver differentiated services that ILECs do not deliver. These differentiated services include higher-speed broadband service and consolidated voice and data services at multiple locations across the operating territories of multiple ILECs.<sup>19</sup> Both of these types of CLEC activities benefit consumers by enabling them to enjoy lower prices, higher levels of service quality, and valued service differentiation. As explained further in Section V below, CLEC access to UNEs and resold services also can enhance fiber-based network investment by CLECs and ILECs alike.

**F. The UST is Aware that the Policy it Advocates is Inappropriate.**

The nationwide forbearance that UST advocates is inconsistent with its own view of sound regulatory policy. The ubiquitous forbearance the UST recommends is very distinct from the more granular policy the Commission has adopted for BDS ... a policy the *UST Petition* commends. The *UST Petition* observes, for instance, that the Commission's BDS policy is "tailored precisely to today's competitive realities," noting that the Commission's "framework uses a 'competitive market test' to identify *counties* in which BDS competition has taken hold" (emphasis added).<sup>20</sup> The *UST Petition* further notes that "In counties that do not pass the test, ... price cap regulation, with an increased annual productivity offset [is employed] to ensure that rates remain just and reasonable."<sup>21</sup> The *UST Petition* concludes that the Commission's policy is "carefully designed to balance the Commission's twin goals of removing regulation that creates disincentives for broadband investment, but retaining such regulation where it [is] necessary to protect consumers."<sup>22</sup>

Clearly, UST recognizes the merits of granular regulatory policies that tailor the nature and extent of regulation to the prevailing local market conditions. Despite this recognition, UST calls for nationwide forbearance, eschewing any need to assess the strength of competitive forces in relevant geographic and product markets. UST also calls for the elimination of price regulation – not the imposition of more stringent price regulation – in regions where competition is not yet able to impose effective price discipline on incumbent suppliers. Furthermore, UST does not acknowledge any need to balance the twin goals of encouraging broadband investment and protecting consumers where some ongoing protection is warranted.<sup>23</sup>

In summary, UST advocates regulatory policy that is inconsistent with its own view of appropriate regulatory policy. Furthermore, the evidence in the *UST Petition* provides no

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<sup>19</sup> See the discussion in Section IV.C below.

<sup>20</sup> *UST Petition*, p. 15.

<sup>21</sup> *Ibid.*

<sup>22</sup> *Ibid.*

<sup>23</sup> The *UST Petition* also fails to note that the nationwide forbearance it seeks will reduce, not increase, broadband investment in many geographic regions. (See Section V below.)

meaningful support for the policy that UST advocates. The evidence consists of highly aggregated statistics that provide little insight regarding the nature and extent of competition in relevant geographic and product markets. Consequently, the *UST Petition* is fundamentally flawed and fails to provide the information the Commission requires to properly evaluate the impact of forbearance on consumers and competition.

#### IV. Duopoly Competition Will Not Protect Consumers.

##### A. Limited Competition Will Persist.

In the many geographic regions where competition presently is limited, ubiquitous, robust competition is unlikely to develop rapidly. The same factors that have inhibited robust competition in many relevant geographic and product markets to date are likely to persist in the near future. Relevant factors include limited geographic concentration of businesses that demand high-bandwidth broadband service, limited revenue potential from low-bandwidth services, and high fixed costs of full facilities-based supply. These costs include the costs of network expansion and the costs of securing access to buildings, conduits, and rights-of-way.<sup>24</sup>

The sunk cost nature of facilities-based supply also can limit entry into a geographic region. In the face of entry, an incumbent supplier can find it profitable to lower the price it charges for a service all the way down to the supplier's incremental cost of delivering the service. Incremental cost can be minimal in the presence of substantial fixed, sunk costs. Fierce price competition from an incumbent supplier will reduce the financial return that a new supplier anticipates from making large, sunk investments to serve potential customers. Consequently, in addition to the often-substantial costs of initiating facilities-based service to a new customer, a non-incumbent supplier that has not established a solid base of loyal customers faces substantial financial risk due to intense price competition from a full facilities-based incumbent supplier.<sup>25</sup> This risk can constitute a

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<sup>24</sup> See, for example: (i) Letter from Paul Margie, Counsel, Sprint, to Marlene H. Dortch, Secretary, FCC, at 7-11, WC Docket No. 16-143 et. al. (filed Mar. 22, 2017) (“Sprint March 22 Ex Parte”) (discussing evidence of entry barriers); (ii) Letter from John Nakahata, Counsel, Windstream, to Marlene H. Dortch, Secretary, FCC, at 17-21, WC Docket Nos. 16-143 et. al. (filed Mar. 27, 2017) (“Windstream March 27 Ex Parte”) (same); (iii) Declaration of Matthew Kohly ¶ 28, attached as Attachment 15 to Opposition of INCOMPAS, FISPA, Midwest Association of Competitive Communications, and the Northwest Telecommunications Association, WC Docket No. 18-141 (filed Aug. 6, 2018) (noting, for instance, the difficulties associated with securing access to telephone poles and rights of way) (“Declaration of Matthew Kohly”); and (iv) Declaration of Dane Jasper, attached as Attachment A to Opposition of Sonic Telecom, LLC to Petition for Forbearance of USTelecom, WC Docket No. 18-141, ¶ 10 (filed Aug. 6, 2018) (citing the problems created by “overloaded poles, inadequate conduit space, local moratoria, and permitting delays”) (“Sonic Decl.”).

<sup>25</sup> The Commission has noted that large sunk costs can promote intense competition among established suppliers (“the high sunk network cost nature of this industry indicates that even as few as two nearby providers have the incentive to undercut each other’s price to win customers so long as they at least recover the incremental cost of extending supply to any customer.” *BDS Order*, ¶123). However, the

substantial barrier to entry by new suppliers. Methods of market entry, such as UNEs and resale, that allow a competitor to build a customer base in a given area before incurring the large fixed, sunk costs of serving the area lower barriers to investment in last-mile fiber networks.

### **B. Reliance on Duopoly Competition is Inappropriate.**

As documented above, many geographic areas are served by at most two full facilities-based providers. Furthermore, the prevailing industry structure in these areas is unlikely to change rapidly.

It is generally inappropriate to rely on duopoly competition to protect consumers. Indeed, economists have cautioned for nearly a century that duopoly may fail to serve consumers any better than monopoly. To illustrate, when analyzing the interaction between two suppliers, Chamberlin observed: “If each seeks his maximum profit rationally and intelligently, he will realize that when there are only two or a few sellers his own move has a considerable effect upon his competitors, and that this makes it idle to suppose that they will accept without retaliation the losses he forces upon them. Since the result of a [price] cut by any one is inevitably to decrease his own profits, no one will cut [price], and although the sellers are entirely independent, the equilibrium result is the same as though there was a monopolistic agreement between them.”<sup>26</sup>

In summarizing more recent work, Scherer observes: “Any realistic theory of oligopoly must take as a point of departure the fact that when market concentration is high, the pricing decisions of sellers are interdependent, and the firms involved can scarcely avoid recognizing their mutual interdependence. ... [W]e should expect oligopolistic industries to exhibit a tendency toward the maximization of collective profits, perhaps even approaching the pricing outcome associated with pure monopoly.”<sup>27</sup>

Similarly, Martin observes that: “when industry output is produced by a few large firms, it is more likely that they will be able to reach a common view about what it is they should do, all else equal. This makes it easier for them to agree to do it. Further, when there are only a few producers, it is [...] easier to detect deviations from the agreed or understood line of conduct. We therefore expect that joint exercise of market power is more likely to occur when seller concentration is high.”<sup>28</sup>

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prospect of intense competition post-entry can serve to deter entry. Consequently, the presence of large sunk costs can harm – not benefit – consumers.

<sup>26</sup> Edward Chamberlin, *The Theory of Monopolistic Competition*. Seventh Edition. Cambridge, MA: Harvard University Press, 1960 (p. 48). This work was first published in 1933.

<sup>27</sup> F. M. Scherer, *Industrial Market Structure and Economic Performance*. Second Edition. Boston, MA: Houghton Mifflin Company, 1980, p. 168.

<sup>28</sup> Stephen Martin, *Industrial Organization in Context*. Oxford: Oxford University Press, 2010, p. 190.

Substantial analytic work formalizes these intuitive observations and identifies conditions under which industry suppliers are particularly likely to engage in tacit collusion that increases prices above competitive levels.<sup>29</sup> Empirical evidence also documents that industry prices increase as industry concentration increases,<sup>30</sup> and that collusive outcomes can emerge under duopoly supply. To illustrate, Parker and Röller document the collusive outcomes that arose in the wireless telecommunications industry when only two carriers were authorized to provide service.<sup>31</sup> In addition, Reiffen and Ward’s study of the pharmaceutical industry finds that “prices steadily decline with an increase in the number of producers and begin to approach long-run marginal cost [only] when there are 10 or more competitors” (*parenthetical text added*).<sup>32</sup> In a recent comprehensive review of mergers in many industries, Kwoka finds that increased industry concentration leads to substantial price increases whenever there are fewer than five competitors.<sup>33</sup>

### C. Forbearance Will Harm Consumers by Limiting Price and Quality Competition.

Competition can benefit consumers in many ways. For example, competition promotes low prices and high levels of service quality. Competition can also benefit consumers by compelling

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<sup>29</sup> See, for example: (i) George Stigler, “A Theory of Monopoly,” *Journal of Political Economy*, 72(1), February 1964, 44-61; (ii) Jean Tirole, *The Theory of Industrial Organization*. Cambridge, MA: The MIT Press, 1988, chapter 6; and (iii) Carl Shapiro, “Theories of Oligopoly Behavior,” in Richard Schmalensee and Robert Willig (eds.), *Handbook of Industrial Organization*, Volume I. Amsterdam: North-Holland, 1989, pp. 329-414.

<sup>30</sup> In summarizing relevant empirical evidence, Schmalensee concludes that “In cross-section comparisons involving markets in the same industry, seller concentration is positively related to the level of price” (Richard Schmalensee, “Inter-Industry Studies of Structure and Performance,” in *Handbook of Industrial Organization*, Vol. II, Richard Schmalensee and Robert Willig (eds), Amsterdam: North-Holland, 1989, p. 988). Similarly, Sutton observes that “a fall in concentration will lead to a fall in prices and price-cost margins is well supported both theoretically and empirically” (John Sutton, “Market Structure: Theory and Evidence,” in *Handbook of Industrial Organization*, Vol. III, Mark Armstrong and Robert Porter (eds), Amsterdam, North-Holland, 2007, p. 2307). Coates and Hubbard observe that “Empirical studies of auction markets and various industries, such as airlines, railroads, books, and pharmaceuticals, show prices declining as the number of bidders or rivals increases and as concentration of sales in a few firms declines” (John Coates and R. Glenn Hubbard, “Competition in the Mutual Fund Industry: Evidence and Implications for Policy,” *Journal of Corporation Law*, 33(1), Fall 2007, p. 164).

<sup>31</sup> Philip Parker and Lars-Hendrik Röller, “Collusive Conduct in Duopolies: Multimarket Contact and Cross-Ownership in the Mobile Telephone Industry,” *RAND Journal of Economics*, 28(2), Summer 1997, pp. 304-322.

<sup>32</sup> David Reiffen and Michael Ward, “Generic Drug Industry Dynamics,” *Review of Economics and Statistics*, 87(1), February 2005, 37-49 (at 38).

<sup>33</sup> John Kwoka, “The Structural Presumption and the Safe Harbor in Merger Review: False Positives or Unwarranted Concerns?” Northeastern University discussion paper, February 2017 (forthcoming in the *Antitrust Law Journal*) (“the vast majority of mergers resulting in five or fewer significant competitors ... have anticompetitive consequences,” p. 47).

suppliers to offer new, innovative services or valued service differentiation. Competing suppliers often attract customers by offering new or differentiated, high-quality services that meet the customers' idiosyncratic needs.

As illustrated in Mr. Zarakas' declaration, a CLEC that employs UNEs can use the ILEC's copper loops in combination with the CLEC's own electronics to offer levels of service that the ILEC has not yet introduced. In approximately half of the census blocks in which Sonic offers broadband service at speeds of 25 Mbps downstream and 3 Mbps upstream ("25/3") or greater, the ILEC does not offer such service.<sup>34</sup> The CLEC is clearly differentiating its service, to the benefit of consumers.

In addition, a single firm is seldom best-equipped to meet the diverse needs of all potential customers. Instead, different firms develop the skills, expertise, and resources required to best meet specialized needs.<sup>35</sup> ILECs often focus on serving large business customers and delivering mass market voice and basic data services to residential customers. In contrast, CLECs often focus on meeting the special needs of small enterprises, municipal governments, schools, and hospitals.<sup>36</sup>

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<sup>34</sup> Declaration of William P. Zarakas, Attachment 2 to Opposition of INCOMPAS, FISPA, Midwest Association of Competitive Communications, and the Northwest Telecommunications Association, at ¶ 10 and Table 4 ("Zarakas Declaration").

<sup>35</sup> Just as countries tend to focus on activities in which they enjoy a comparative advantage relative to other countries (*see*, for instance, R. Dornbusch, S. Fischer and P. Samuelson, "Comparative Advantage, Trade, and Payments in a Ricardian Model with a Continuum of Goods," *American Economic Review*, 67(5), December 1977, 823-839), companies focus on supplying the goods and services that they have become particularly adept at supplying.

<sup>36</sup> *See*, for example, the Declarations of Larry Antonellis (Granite ¶ 4); James Bellina ¶ 9, attached as Attachment 5 to Opposition of INCOMPAS, FISPA, Midwest Association of Competitive Communications, and the Northwest Telecommunications Association, WC Docket No. 18-141 (filed Aug. 6, 2018) ("Declaration of James Bellina"); Jeff Buckingham ¶ 9, attached as Attachment 6 to Opposition of INCOMPAS, FISPA, Midwest Association of Competitive Communications, and the Northwest Telecommunications Association, WC Docket No. 18-141 (filed Aug. 6, 2018); Dan Bubb ¶ 7, attached as Attachment 9 to Opposition of INCOMPAS, FISPA, Midwest Association of Competitive Communications, and the Northwest Telecommunications Association, WC Docket No. 18-141 (filed Aug. 6, 2018) ("Declaration of Dan Bubb"); Douglas Denney (Allstream ¶ 16), attached as Attachment 4 to Opposition of INCOMPAS, FISPA, Midwest Association of Competitive Communications, and the Northwest Telecommunications Association, WC Docket No. 18-141 (filed Aug. 6, 2018) ("Declaration of Douglas Denney"); Daniel Friesen ¶ 2, attached as Attachment 11 to Opposition of INCOMPAS, FISPA, Midwest Association of Competitive Communications, and the Northwest Telecommunications Association, WC Docket No. 18-141 (filed Aug. 6, 2018) ("Declaration of Daniel Friesen"); John Hoehne ¶¶ 7-8, attached as Attachment 3 to Opposition of INCOMPAS, FISPA, Midwest Association of Competitive Communications, and the Northwest Telecommunications Association, WC Docket No. 18-141 (filed Aug. 6, 2018) ("Declaration of John Hoehne"); Dusan Janjic ¶ 2, attached as Attachment 16 to Opposition of INCOMPAS, FISPA, Midwest Association of Competitive Communications, and the Northwest Telecommunications Association, WC Docket No. 18-141 (filed Aug. 6, 2018); Declaration of Matthew Kohly (Socket ¶¶ 47-48); Jeff Rhoden ¶ 2, attached as Attachment 12 to Opposition of

Serving these customers may not be as profitable as serving large corporations and mass-market residential customers. However, such specialization can allow CLECs to earn a reasonable return on their investments as they serve idiosyncratic needs that ILECs often choose not to serve.<sup>37</sup> Such specialization also secures benefits for CLEC customers, as evidenced by their decision to purchase the specialized services.

Access to UNEs and resold services is often instrumental in allowing CLECs to serve their customers' needs, particularly during initial stages of operation. Such access can enable CLECs to offer higher-quality services than ILECs offer. To illustrate, UNE access has permitted Douglas Fast Net, Gorge Networks, and IdeaTek to offer much faster broadband service to rural customers than ILECs offer.<sup>38</sup>

Access to UNEs and resold services also enables CLECs to deliver services that ILECs choose not to offer. For example, Digital West, Gorge Networks, IdeaTek, Mammoth Networks, and Socket Telecom employ UNEs to deliver broadband service in rural regions where ILECs

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INCOMPAS, FISPA, Midwest Association of Competitive Communications, and the Northwest Telecommunications Association, WC Docket No. 18-141 (filed Aug. 6, 2018) (“Declaration of Jeff Rhoden”); Margi Shaw ¶¶ 2-3, attached to Opposition of First Communications, LLC, WC Docket No. 18-141 (filed Aug. 6, 2018) (“Declaration of Margi Shaw”); Brian Worthen ¶ 4, attached as Attachment 13 to Opposition of INCOMPAS, FISPA, Midwest Association of Competitive Communications, and the Northwest Telecommunications Association, WC Docket No. 18-141 (filed Aug. 6, 2018) (“Declaration of Brian Worthen”); Russell Shipley (TPx ¶¶ 9, 15, 35).

<sup>37</sup> Thus, specialization promotes product differentiation and the development of specific expertise that customers value. (See, for instance Alton, Larry, “5 Reasons Modern Businesses Are Turning To Specialization,” *Forbes*, December 20, 2016 (<https://www.forbes.com/sites/larryalton/2016/12/20/5-reasons-modern-businesses-are-turning-to-specialization/#37cbb6634a29>). The reasons for and the benefits of specialization are analyzed in numerous academic studies, including: (i) Robert Lucas, “On the Size Distribution of Business Firms,” *Bell Journal of Economics*, 9(2), Autumn 1978, 508-523; and (ii) Luis Garicano and Thomas Hubbard, “Specialization, Firms, and Markets: The Division of Labor within and between Law Firms,” *Journal of Law, Economics, and Organization*, 25(2), October 2009, 339-371.

<sup>38</sup> See Declaration of Todd Way ¶ 2 (explaining that “DFN’s fiber-to-the-node network drastically outperforms the CenturyLink’s TI-fed DSLAMs, offering services of up to 40 Mbps where CenturyLink only offers 1.5 Mbps.”), attached as Attachment 7 to Opposition of INCOMPAS, FISPA, Midwest Association of Competitive Communications, and the Northwest Telecommunications Association, WC Docket No. 18-141 (filed Aug. 6, 2018) (“Declaration of Todd Way”); Declaration of Dan Bubb (Gorge ¶¶ 2, 7) (noting that Gorge “bond[s] several DS0 loops to provide speeds well beyond what the ILEC can provide over the same copper loops,” in rural areas of Oregon and Washington); and Declaration of Daniel Friesen (IdeaTek ¶ 4) (explaining that it is extending “service outside the ILEC service coverage area,” to “serve ... rural farms and homes often unserved or serve with lower speed broadband.”).

have the technological capability to deliver corresponding service, but decline to do so.<sup>39</sup> In addition, companies like Allstream Business US, Granite Telecommunications, and Socket Telecom employ UNEs and resold services to deliver voice, basic data, trouble-shooting, and coordinated billing services to customers that operate simultaneously at hundreds, if not thousands, of dispersed locations throughout the nation.<sup>40</sup>

In these ways and others, access to UNEs and resold services empower CLECs to benefit consumers by fostering more robust competition than duopolies engender. The more robust competition promotes lower prices, higher levels of service quality, and valued service differentiation.

#### **D. The Commission Recognizes the Dangers of Duopoly Supply.**

The Commission is well aware of the fact that duopoly competition generally is insufficient to protect consumers. The Commission has observed that it is not the case that “duopoly always constitutes effective competition and is necessarily sufficient to ensure just, reasonable, and nondiscriminatory rates and practices, and to protect consumers.”<sup>41</sup> The Commission has further noted that a compelling case for forbearance requires “additional evidence of robust competition” above and beyond the presence of duopoly competition.<sup>42</sup> The Commission’s policy in this regard is well-crafted. Forbearance risks substantial harm to consumers in geographic and product markets where forbearance would empower the ILEC to effectively operate as a duopolist (or monopolist).

In summary, duopoly competition generally fails to protect consumers adequately. The ubiquitous forbearance that UST seeks would expand monopoly and duopoly supply of important communications services. Consequently, although the ubiquitous forbearance that UST seeks would enhance the profits of its members by allowing them to charge monopoly prices for critical inputs or deny access to the inputs altogether, the forbearance would harm consumers.

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<sup>39</sup> See the Declarations of Jeff Buckingham (Digital West ¶¶ 2, 12); Dan Bubb (Gorge Networks ¶¶ 2, 10), Daniel Friesen (IdeaTek ¶ 4), Brian Worthen (Mammoth ¶ 10), and Matthew Kohly (Socket Telecom ¶ 8).

<sup>40</sup> See the Declarations of Douglas Denney (Allstream ¶ 14), Larry Antonellis (Granite ¶¶ 4-7), and Matthew Kohly (Socket Telecom ¶ 34-40).

<sup>41</sup> *Qwest Phoenix Order*, ¶ 29.

<sup>42</sup> See *id.*, ¶ 32.

**V. Forbearance Will Also Harm Consumers by Reducing Broadband Infrastructure Investment.**

In addition to harming consumers by expanding monopolistic or duopolistic supply of important communications services, the ubiquitous forbearance UST seeks would reduce broadband infrastructure investment. The *UST Petition* initially asserts (largely without explanation) that prevailing regulations “distort incentives to invest in broadband infrastructure.”<sup>43</sup> This assertion appears to be based on the premise that if CLECs are denied access to UNEs and resold services, they will develop or expand their own infrastructure. This premise is suspect for at least two reasons.

**A. Forbearance Will Raise CLEC Costs and Limit their Operation.**

First, in some instances, the investment required to supply retail communications services over new, proprietary infrastructure is prohibitively costly. This is particularly likely to be the case in rural, residential regions with particularly low population densities. If CLECs are denied access to UNEs and resold services in these regions, they will not expand their infrastructure and will not serve customers. Consumers will be harmed when their choice among competing suppliers becomes more limited.

Retail customers will also be harmed if, after forbearance, ILECs continue to provide access to UNEs and resold services, but at prices that exceed present levels.<sup>44</sup> CLECs typically will be compelled to pass some or all of their increased costs onto retail customers in the form of higher prices. There is little doubt that ILECs will raise the prices of these services if authorized to do so. Indeed, the ILECs’ clear purpose in requesting forbearance is to enhance their profit by securing the Commission’s permission to raise their rivals’ costs and thereby limit the rivals’ ability to impose competitive discipline on ILECs.

Regardless of whether ubiquitous forbearance eliminates CLECs or simply diminishes their ability to discipline ILECs, the forbearance will harm consumers by limiting competition in the provision of important communications services in many geographic regions.<sup>45</sup>

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<sup>43</sup> *UST Petition*, p. 19.

<sup>44</sup> Forbearance could well lead to dramatic increases in the prices of key inputs. For instance, Socket Telecom observes that if it is forced to replace UNE DS1 EELs, its wholesale cost for comparable service could increase by more than 350%. (*See* the Declaration of Matthew Kohly, ¶ 46); Mammoth Networks notes that forbearance could increase its cost of inter-office transport by more than 800%. (*See* the Declaration of Brian Worthen, ¶ 13.)

<sup>45</sup> *See, e.g.*, Zarakas Declaration ¶ 10 (illustrating Sonic’s competitive supply of broadband service levels of 25/3 or greater, and documenting that Sonic’s absence would lead to monopoly or duopoly supply).

**B. Forbearance Will Reduce CLEC Broadband Investment.**

Second, and perhaps more importantly, it is not appropriate to view a CLEC as making a single, static choice between building its own network and employing an ILEC's network to serve customers. In practice, CLECs often employ UNEs or resold services initially as they build their customer base. Then, once a CLEC has established a solid base of loyal customers in a given geographic region, the CLEC expands its own fiber-based network to serve customers in the region on a long-term basis.

This process is well-documented, both in principle and in fact. The Telecommunications Act envisions precisely this pattern of expanding industry investment.<sup>46</sup> In addition, many CLECs in this proceeding explain how they employ UNEs and resold services as stepping stones to more extensive facilities-based competition. For example, Socket Telecom explains how it initially employed UNEs to serve customers in rural Missouri that multiple facilities-based suppliers declined to serve, and how it now employs its own fiber network to serve these customers and others.<sup>47</sup>

Similarly, Sonic explains how it uses UNEs as a critical element of a dynamic policy to continually build out its fiber network in California. Whereas Sonic began by serving almost all of its customers with UNEs, the company now serves between a quarter and a third of its customers using its own fiber network.<sup>48</sup> As Mr. Zarakas documents, Sonic has been increasing the number of census blocks in which it serves customers using its own fiber.<sup>49</sup>

This increasing fiber investment reflects in part the ongoing race between ILECs and CLECs to deploy fiber. CLECs know that as ILECs make their own investments in fiber networks and retire copper networks, DS0 copper UNEs in particular will no longer be available. Consequently, CLECs recognize the importance of building their own networks to serve their customers before the ILEC retires any copper loops the CLECs may presently be employing. Thus,

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<sup>46</sup> See *Petition for Declaratory Ruling to Clarify 47 U.S.C. § 572 in the Context of Transactions Between Competitive Local Exchange Carriers and Cable Operators*, Order, 27 FCC Rcd. 11532, 11541 ¶ 20 (citing 47 U.S.C. §§ 251, 252) (2012) (noting that Congress enacted Section 251 “to foster development of competition for telecommunications services by allowing competitive LECs to use the incumbent LECs’ networks (through resale or unbundled network elements), rather than forcing the new market entrants to rely exclusively on their own facilities”); see also S. Conf. Rep. No. 104-230, at 148, 142 Cong. Rec. H. 1078 (1996) (“This conference agreement recognizes that it is unlikely that competitors will have a fully redundant network in place when they initially offer local service, because the investment necessary is so significant.”)

<sup>47</sup> See Declaration of Matthew Kohly, ¶¶ 25-26. For additional evidence of how CLECs routinely employ UNEs temporarily as they expand their network facilities, see the Declarations of Dan Bubb of Gorge Networks (¶ 11) and Douglas Denney of Allstream Business US, LLC (¶ 9).

<sup>48</sup> See Sonic Decl. ¶ 9.

<sup>49</sup> Zarakas Declaration ¶¶ 11-13.

the declining use of UNEs and resold services cited in the *UST Petition*<sup>50</sup> likely indicates that UNE access is performing its intended function well in certain geographic regions (e.g., those with moderate population densities), and that continued UNE access will allow this success to be extended to other regions (e.g., those with lower population densities) where fiber deployment is less profitable.

The central point here is that, in practice, CLECs cannot view UNEs as a long-term substitute for their own fiber investment. Instead, they must view UNEs as a transitional means to reduce the risk associated with investment in their own fiber network.<sup>51</sup> UNEs thereby enhance, rather than discourage, CLEC broadband investment. Consequently, the forbearance that UST seeks risks reducing CLEC broadband infrastructure investment, not increasing this investment as the *UST Petition* and the *Economists' Report* claim.

### C. Forbearance Will Reduce ILEC Broadband Investment.

The long-term increase in CLEC investment facilitated by access to UNEs and resold services can, in turn, stimulate ILEC broadband investment. There are many geographic regions in which ILECs have not yet converted their copper-based facilities to fiber. As CLECs expand their fiber networks to serve customers in these regions, ILECs often will feel pressured to follow suit. This fact has been identified in empirical research.<sup>52</sup> This fact is also well-documented in the present proceeding. For instance, Sonic reports that it was the first company to deliver fiber to the premise in several regions of California. In many neighborhoods, AT&T only offered the service as a response to Sonic's initiative.<sup>53</sup> And Sonic has built fiber to more census blocks than its ILEC competitors.<sup>54</sup>

The ubiquitous forbearance that UST seeks also would eliminate an important incentive for ILEC broadband investment. Current regulations authorize CLECs to access certain UNEs only where the ILEC is employing copper-based facilities. Consequently, current regulations provide a strong incentive for ILECs to fully convert their copper facilities to fiber. The incentive arises because such conversion endows ILECs with expanded rights to deny CLEC access to their

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<sup>50</sup> *UST Petition*, pp. 15-19.

<sup>51</sup> Matthew Kohly of Socket Telecom characterizes as “unequivocally ... not true” the assertion that CLECs have little long-term interest in building their own networks. *See* Declaration of Matthew Kohly, ¶ 17.

<sup>52</sup> *See*, for example, Glenn Woroch, “Competition’s Effect on Investment in Digital Infrastructure,” University of California at Berkeley discussion paper, May 2000, available at [elsa.berkeley.edu/~woroch/investment%20competition.pdf](http://elsa.berkeley.edu/~woroch/investment%20competition.pdf) (noting in reference to investment in digital fiber rings that “CLEC entry leads to subsequent ILEC investment” and “incumbents and entrants match each others’ investments”, at title page).

<sup>53</sup> *See* Sonic Decl. ¶ 11.

<sup>54</sup> *See* Zarakas Declaration, ¶ 5 and Table 1.

networks. ILECs value these expanded rights highly, as the *UST Petition* makes apparent. Forbearance would hand these rights to ILECs even if they choose not to fully convert their copper networks to fiber. Consequently, the ubiquitous forbearance that UST seeks stands to reduce fiber-based broadband infrastructure investment by removing a potentially strong incentive for such investment by ILECs.

**D. State Reviews of UNE Rates Best Address Any Legitimate Concerns about Changing UNE Costs.**

UST’s call for forbearance remains suspect even if one (inappropriately) ignores the dynamic nature of CLEC operations and the fact that current access to UNEs and resold services can promote future investment in broadband infrastructure. The *UST Petition* eventually admits that prevailing regulations limit efficient, static investment in broadband infrastructure only if UNE prices are set below prescribed levels. Specifically, the petition states that “mandates that make legacy facilities and services available at artificially low rates reduce incentives for competitors to deploy their own broadband facilities.”<sup>55</sup> The petition also asserts that “below-market UNE rates distort investment decisions.”<sup>56</sup>

UNE prices are intended to reflect a supplier’s total element long-run incremental cost (TELRIC). Therefore, a TELRIC-based UNE price reflects the forward-looking, efficient cost of supplying the UNE. When a supplier faces such a UNE price at any moment in time, it has an economic incentive to operate using the UNE if and only if industry costs are lower when the relevant retail service is supplied via the UNE rather than via independent infrastructure investment by the supplier. In other words, TELRIC-based UNE prices induce suppliers to make efficient “make-or-buy” decisions and thereby minimize industry production costs.<sup>57</sup>

This fact implies that even if one adopts UST’s (inappropriate) static view of CLEC operations, UST’s assertion regarding investment distortions has merit only if its claim that UNE prices do not reflect TELRIC principles is accurate. UST’s assertion is thereby lacking in at least two important respects. First, the claim that UNE prices are set below TELRIC levels is

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<sup>55</sup> *UST Petition*, p. 23.

<sup>56</sup> *Ibid*, p. 26.

<sup>57</sup> See *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, First Report and Order, 11 FCC Rcd. 15499, 15849 ¶ 685 (1996) (explaining that TELRIC-based pricing “encourages facilities-based competition to the extent that new entrants, by designing more efficient network configurations, are able to provide the service at a lower cost than the incumbent LEC”); see also *Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers*, Report and Order and Order on Remand and Further Notice of Proposed Rulemaking, 18 FCC Rcd. 16978, 17392 ¶ 670 (2003) (“TRO”) (“TELRIC assumes that the value of an incumbent LEC’s network is constrained by the most efficient technology available, even if the incumbent LEC itself does not deploy, or plan to deploy, that technology”).

unsubstantiated. Second, if there is some merit to this (unsubstantiated) claim, then UST’s alleged concern with static, myopic investment decisions is better addressed by presenting state public utility commissions with evidence that justifies changes in UNE prices than by implementing nationwide forbearance. The former policy can address the alleged problem directly without risking the substantial consumer harm that ubiquitous forbearance would introduce.<sup>58</sup>

In summary, the nationwide forbearance that UST seeks threatens to reduce broadband investment by both CLECs and ILECs. In doing so, the forbearance would harm consumers of communications services and the American economy more broadly.

## **VI. The *Economists’ Report* is Fatally Flawed.**

### **A. The *Economists’ Report* Repeats the Fundamental Error in the *UST Petition*.**

The *Economists’ Report* says nothing about how resold services can enable CLECs to better serve consumers and impose competitive discipline on ILECs. With respect to UNEs, the report suffers from the same fundamental flaw that plagues the *UST Petition*. Specifically, the report fails to adequately assess the state of competition in relevant product and geographic markets. This failure leads to implausible assumptions and conclusions.

The *Economists’ Report* assumes that many consumers presently pay relatively high prices for legacy communications services of relatively low quality.<sup>59</sup> The report further assumes that many of these consumers would quickly begin to purchase higher-quality, lower-priced next-generation communications services once forbearance was implemented. The *Economists’ Report* relies upon estimates of nationwide average prices for next-generation services like Ethernet broadband.<sup>60</sup> In doing so, the report assumes these services are readily available to all customers at the specified prices. However, if, as the report suggests, these superior services are readily

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<sup>58</sup> The *Economists’ Report* (p. 12) faults current regulatory policy for setting UNE prices “below market.” This criticism is misguided. It fails to recognize the appropriate role of regulatory policy. Competition drives prices to reflect costs. As Alfred Kahn has noted, the primary task of regulation is to replicate the discipline that competition would impose, if it were present. (See Alfred Kahn, *The Economics of Regulation: Principles and Institutions*, New York: John Wiley and Sons, Vol. I, 1970, p. 17 (“The single most widely accepted rule for the governance of the regulated industries is regulate them in such a way as to produce the same results as would be produced by effective competition, if it were feasible”)) Thus, the price of a UNE should reflect its cost (as TELRIC principles prescribe). In the absence of robust competition, the market price of a service typically will exceed its cost. Consequently, UNE prices that reflect cost – not market prices – can be entirely appropriate, and do not reflect a failing of the regulatory process.

<sup>59</sup> The *Economists’ Report* estimates that “Across the board, prices for next-generation products are lower than the legacy products they are replacing” (p. 16).

<sup>60</sup> See, for example, the *Economists’ Report* (Figure 9, p. 17).

available at lower prices than consumers presently pay for corresponding legacy services, why would consumers purchase the allegedly lower-quality services at higher prices?

Clearly, the premise that underlies the *Economists' Report* makes no sense. Consumers will only purchase low-quality services at high prices if they are unable to purchase higher-quality services at lower prices. The obvious reason why consumers purchase legacy services at relatively high prices is that next-generation services are not available at the nationwide average prices cited in the *Economists' Report*.<sup>61</sup> The next-generation services may be available to customers in some geographic regions at the specified prices, but the services are not available at these prices in all relevant geographic markets. Thus, the failure of the *Economists' Report* to account for key differences across relevant geographic and product markets leads to implausible conclusions.

**B. The Fundamental Error in the *Economists' Report* Leads to Implausible Conclusions.**

The failure of the *Economists' Report* to adequately assess the state of competition in relevant product and geographic markets leads to implausible over-estimates of the gains that forbearance would deliver to consumers. The report predicts that forbearance would substantially increase consumer surplus as consumers rapidly switch from high-priced legacy services to low-priced next-generation services. The predicted increase in consumer surplus will not arise if, in fact, consumers in many geographic regions are unable to make such a switch.

The *Economists' Report* also exaggerates the impact of forbearance on broadband investment and job creation. The report predicts that a great deal of new investment will be undertaken in order to satisfy the substantial increase in the demand for next-generation services that forbearance will induce. However, as explained above, the predicted increase in demand reflects inappropriate assumptions about the prices and availability of next-generation services. If the projected demand does not materialize, then neither will the predicted investment and job creation – even if the assumptions in the *Economists' Report* regarding the investment patterns of industry participants are valid (which is far from apparent).

**C. The *Economists' Report* Relies on Unverifiable Information.**

Compounding the identified fundamental flaw in the *Economists' Report* is its reliance on unverifiable information. The authors report that they “calculated the weighted average price for each product based on pricing information provided by the ILECs.”<sup>62</sup> Because the authors do not

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<sup>61</sup> It is also possible that, for the reasons explained above, some consumers prefer legacy circuit-based (TDM) services to next-generation services even when the two types of service are available at comparable prices.

<sup>62</sup> The *Economists' Report*, p. 14.

make this “pricing information” available, the accuracy of the information and thus the merits of the conclusions drawn using the information cannot be verified.

The authors further report that they “interviewed the contributing ILECs to better understand the most likely retail products associated with each UNE offering.”<sup>63</sup> The nature and accuracy of the information provided during these interviews (and thus the conclusions drawn from the information) are difficult to assess.

In summary, the *Economists’ Report* relies on unverifiable information and highly implausible assumptions. The implausible assumptions, in turn, completely undermine the credibility of the conclusions drawn in the report.

## VII. Conclusions.

The nature and extent of competition in the provision of communications services varies widely across the United States. There are many geographic regions in which competition in the supply of important communications services is limited. The nationwide forbearance that UST advocates would harm consumers by further limiting competition in these regions. Forbearance would also reduce investment in broadband infrastructure and thereby harm consumers and the American economy.

The misguided analysis in the *UST Petition* and the *Economists’ Report* does not support the UST’s call for ubiquitous forbearance. The lack of meaningful support for such forbearance is not surprising. The requested forbearance would increase ILEC profit by authorizing ILECs to exclude or seriously weaken their competitors. However, the forbearance would harm consumers by limiting competition in the supply of important communications services in many geographic regions of the United States. The Commission can avoid this harm by declining to grant the UST’s inappropriate request for nationwide forbearance.

I declare the foregoing to be true and correct to the best of my knowledge, under penalty of perjury.



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David Sappington

August 6, 2018

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Date

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<sup>63</sup> *Ibid*, p. 15.

**REDACTED – FOR PUBLIC INSPECTION**

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- “Contracting With Wealth-Constrained Agents,” *International Economic Review*, Vol. 41(3), August 2000, pp. 743-767 (with T. Lewis).

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- “Motivating Wealth-Constrained Actors,” *The American Economic Review*, Vol. 90(4), September 2000, pp. 944-960 (with T. Lewis).
- “Optimal Contracting With Private Knowledge of Wealth and Ability,” *The Review of Economic Studies*, Vol. 68(1), January 2001, pp. 21-44 (with T. Lewis).
- “How Liable Should a Lender Be? The Case of Judgement Proof Firms and Environmental Risk: Comment,” *The American Economic Review*, Vol. 91(3), June 2001, pp. 724-730 (with T. Lewis).
- “The State of Performance-Based Regulation in the U.S. Electric Utility Industry,” *The Electricity Journal*, Vol. 14(8), October 2001, pp. 71-79 (with G. Basheda, P. Hanser, and J. Pfeifenberger).
- “The Impact of State Incentive Regulation on the U.S. Telecommunications Industry,” *The Journal of Regulatory Economics*, Vol. 22(2), September 2002, pp. 133-159 (with C. Ai).
- “Economic Issues at the Federal Communications Commission,” *The Review of Industrial Organization*, Vol. 21(4), December 2002, pp. 337-356 (with E. Kwerel, J. Levy, R. Pepper, D. Stockdale, and J. Williams).
- “Regulating Horizontal Diversification,” *International Journal of Industrial Organization*, Vol. 21(3), March 2003, pp. 291-315.
- “The Federal Communications Commission’s Competition Policy and Marketing’s Information Technology Revolution,” *Journal of Public Policy & Marketing*, Vol. 22(1), Spring 2003, pp. 26-34 (with D. Stockdale).
- “Incentives for Anticompetitive Behavior by Public Enterprises,” *Review of Industrial Organization*, Vol. 22(3), May 2003, pp. 183-206 (with J.G. Sidak).
- “The Effects of Incentive Regulation on Retail Telephone Service Quality in the United States,” *Review of Network Economics*, Vol. 2(4), December 2003, pp. 355-375.
- “Competition Law for State-Owned Enterprises,” *Antitrust Law Journal*, Vol. 71(2), December 2003, pp. 479-523 (with J.G. Sidak).
- “Competition Policy, Parity Regulation, and Self-Sabotage,” *Info*, Vol. 6(1), February 2004, pp. 52-56 (with D. Weisman).
- “Efficient Manipulation in a Repeated Setting,” *Journal of Accounting Research*, Vol. 42(1), March 2004, pp. 31-49 (with J. Demski and H. Frimor).
- “Toward a Synthesis of Models of Regulatory Policy Design with Limited Information,” *The Journal of Regulatory Economics*, Vol. 26(1), July 2004, pp. 5-21 (with M. Armstrong).

**JOURNAL PUBLICATIONS (CONTINUED):**

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“On the Design of Performance Measurement Plans in the Telecommunications Industry,” *Telecommunications Policy*, Vol. 28(11), December 2004, pp. 801-820 (with L. Wood).

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- “Motivating Energy Suppliers to Promote Energy Conservation,” *The Journal of Regulatory Economics*, Vol. 43(3), June 2013, pp. 229-247 (with L. Chu).
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Winner of *The Energy Journal*’s Best Paper Award.

“Optimal Policies to Promote Efficient Distributed Generation of Electricity,” *The Journal of Regulatory Economics*, Vol. 52(2), October 2017, pp. 158-188 (with D. Brown).

“On the Role of Maximum Demand Charges in the Presence of Distributed Generation Resources,” *Energy Economics*, Vol. 69, January 2018, pp. 237-249 (with D. Brown).

“An Optimal Rule for Patent Damages Under Sequential Innovation,” *The RAND Journal of Economics*, Vol. 49(2), Summer 2018, pp. 370-397 (with Y. Chen).

“Optimal Procurement of Distributed Energy Resources,” *The Energy Journal*, forthcoming (with D. Brown).

**BOOKS/MONOGRAPHS:**

*Designing Regulatory Policy with Limited Information*. London, England: Harwood Academic Publishers, 1987 (with D. Besanko).

*Designing Incentive Regulation for the Telecommunications Industry*. Cambridge, MA: The MIT Press, 1996 (with D. Weisman).

*Information Economics: Critical Concepts in Economics. Volumes I – IV*. New York, NY: Routledge, 2014 (co-edited with M. Baye).

*Economics of Regulation and Antitrust*. Fifth Edition. Cambridge, MA: The MIT Press, 2018 (with K. Viscusi and J. Harrington).

## BOOK CHAPTERS:

- “Procurement and Quality Monitoring,” in *Incentives in Procurement Contracting*, edited by J. Leitzel and J. Tirole. Westview Press, 1993, pp. 61-70 (with T. Lewis).
- “Principles of Regulatory Policy Design,” in *Infrastructure Delivery: Private Initiative and the Public Good*, edited by A. Mody. The World Bank, 1996, pp. 79-105.
- “Seven Myths About Incentive Regulation,” in *Pricing and Regulatory Innovations Under Increasing Competition*, edited by M. Crew. Kluwer Academic Publishers, 1996, pp. 1-20 (with D. Weisman).
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- “Anticompetitive Behavior by State-Owned Enterprises: Incentives and Capabilities,” in *Competing with the Government: Anticompetitive Behavior and Public Enterprises*, edited by R. Richard Geddes. Hoover Press, 2004, pp. 1-25 (with J. G. Sidak).
- “Recent Developments in the Theory of Regulation,” in *The Handbook of Industrial Organization, Volume 3*, edited by M. Armstrong and R. Porter. Elsevier Science Publishers, 2007, pp. 1557-1700 (with M. Armstrong).
- “Pricing in Network Industries,” in *The Oxford Handbook of Regulation*, edited by R. Baldwin, M. Cave, and M. Lodge. Oxford University Press, 2010, pp. 462-499 (with J. Hauge).

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- “Review of Berg and Tschirhart's *Natural Monopoly Regulation*,” *Managerial and Decision Economics*, Vol. 11(1), February 1990, pp. 70-71.
- “Review of Laffont and Tirole's *A Theory of Incentives in Procurement and Regulation*,” *Journal of Economic Literature*, Vol. 32(2), June 1994, pp. 720-721.
- “Review of Vogelsang and Mitchell's *Telecommunications Competition: The Last Ten Miles*,” *Information Economics and Policy*, Vol. 9(4), December 1997, pp. 354-357.
- “Review of Vogelsang and Mitchell's *Telecommunications Competition: The Last Ten Miles*,” *Review of Industrial Organization*, Vol. 12(5-6), December 1997, pp. 837-840.
- “Are Public Enterprises the Only Credible Predators?” *The University of Chicago Law Review*, Vol. 67(1), Winter 2000, pp. 271-292 (with G. Sidak).

**BOOK REVIEWS (CONTINUED):**

“Review of Sclar’s *You Don’t Always Get What You Pay For: The Economics of Privatization*,” *Journal of Economic Literature*, Vol. 39(2), June 2001, pp. 601-603.

“Review of De Bijl and Peitz’s *Regulation and Entry into Telecommunications Markets*,” *Journal of Economic Literature*, Vol. 42(2), June 2004, pp. 538-539.

**OTHER PUBLICATIONS:**

“Consumer Shopping Behavior in The Retail Coffee Market: A Comment,” in *Proceedings of the Federal Trade Commission's Conference on Empirical Approaches to Consumer Protection Economics*, edited by P. Ippolito and D. Scheffman, 1986, pp. 445-446.

“Endogenous Commitment and Regulatory Design: A Comment on Levy and Spiller’s *Regulation, Institutions, and Commitment in Telecommunications*,” in *Proceedings of the World Bank Annual Conference on Development Economics*, edited by M. Bruno and B. Pleskovic. The World Bank, 1994, pp. 253-256.

“Comment on R. Geddes’ ‘Agency Costs and Governance in the United States Postal Service’,” in *Governing the Postal Service*, edited by J. G. Sidak. American Enterprise Institute, 1994, pp. 140-143.

“Economic Theory of Regulation,” in *The International Encyclopedia of the Social and Behavioral Sciences*, edited by N. Smelser and P. Baltes, Elsevier Science Publishers, 2001.

“Overview of the Special Issue – Marketing’s Information Technology Revolution: Implications for Consumer Welfare and Economic Performance,” *Journal of Public Policy & Marketing*, Vol. 22(1), Spring 2003, p. 3 (with A. Silk).

“Introduction,” to *Information Economics: Critical Concepts in Economics. Volumes I – IV*. New York, NY: Routledge, 2014 (with M. Baye).

“Economic Theory of Regulation,” in *The International Encyclopedia of the Social and Behavioral Sciences* (2<sup>nd</sup> Edition), edited by J. Wright. Oxford: Elsevier Ltd., 2015.

“In Memoriam to Michael A. Crew (1942–2016),” *The Journal of Regulatory Economics*, 52(2), October 2017, pp. 105-106 (with M. Spiegel).

**HONORS AND AWARDS:**

- |             |   |
|-------------|---|
| 2017 – 2019 | Term Professorship Award, University of Florida.                                      |
| 2017        | <i>The Energy Journal's</i> Best Paper Award.   |
| 2015        | Distinguished Member Award<br>Transportation and Public Utilities Group.              |
| 2015        | Faculty Honoree, Anderson Scholars Program<br>University of Florida.                  |
| 2011 – 2014 | Research Foundation Professorship, University of Florida.                             |
| 2003        | Distinguished Service Award, Public Utility Research Center<br>University of Florida. |
| 2000        | Faculty Honoree, Anderson Scholars Program<br>University of Florida.                  |
| 1998        | Professorial Excellence Program Award, University of Florida.                         |
| 1997 – 2000 | Research Foundation Professorship, University of Florida.                             |
| 1992        | Research Achievement Award, University of Florida.                                    |
| 1976        | Inducted into the Phi Beta Kappa Society.   |

**REFEREE/REVIEWER FOR:**

Accounting Review	Journal of Economic Behavior and Organization
Addison Wesley, Publishers	Journal of Economic Dynamics and Control
American Economic Journals:	Journal of Economic Literature
Economic Policy, Microeconomics	Journal of Economic Theory
American Economic Review	Journal of Economics and Business
American Law and Economics Review	Journal of Economics and Management Strategy
American Enterprise Institute	Journal of Environmental Economics and Management
Bell Journal of Economics	Journal of Health Economics
Berkeley Electronic Press Journal of Economic Analysis and Policy	Journal of Industrial Economics
Bulletin of Economic Research	Journal of International Economics
Cambridge University Press	Journal of Law and Economics
China Economic Review	Journal of Law, Economics and Organization
Danish Social Science Research Council	Journal of Marketing Research
Economic Journal	Journal of Policy Analysis and Management
Econometrica	Journal of Political Economy
Economic and Social Research Council	Journal of Public Economics
Economic Design	Journal of Public Policy and Marketing
Economic Inquiry	Journal of Regulatory Economics
Economics Letters	Management Science
Economic Theory	Managerial and Decision Economics
Energy Economics	Marketing Science
Energy Journal	MIT Press
Encyclopedia of Law and Economics	National Science Foundation
European Economic Review	Nonlinear Dynamics and Systems Theory
European Journal of Operational Research	Oxford Economic Papers
Games and Economic Behavior	Oxford University Press
Harcourt Brace, Publishers	Princeton University Press
International Economic Review	Quarterly Journal of Economics
Information Economics and Policy	Quarterly Review of Economics and Business
International Journal of Industrial Organization	Rand Journal of Economics
International Journal of the Economics of Business	Research Grants Council of Hong Kong
International Review of Law and Economics	Research in Labor Economics
Israel Science Foundation	Review of Economic Studies
Johns Hopkins University Press	Review of Economics and Statistics
John Wiley, Publishers	Review of Industrial Organization
Journal of Accounting Research	Review of Network Economics
Journal of the American Statistical Association	Sloan Foundation
Journal of Business	Southern Economic Journal
Journal of Competition Law & Economics	Telecommunications Policy
Journal of Corporate Finance	Utilities Policy
	World Bank Economic Review

**SELECTED ADDITIONAL EXPERIENCE:**

- 1997 – Present     Instructor in *The International Training Program on Utility Regulation and Strategy*, sponsored by The World Bank and the University of Florida's Public Utility Research Center.
  
- 2018 – Present     Advisor to DISH Network on  
Industry Consolidation in the Communications Sector.
  
- 2018 – Present     Advisor to INCOMPAS on  
The Design of Competition Policy in the Communications Sector.
  
- 2017                 Advisor to DISH Network on  
Competition Policy in Broadband and Media Markets.
  
- 2016                 Advisor to Norfolk Southern Corporation on  
The Design of Access Policy in the Railroad Industry.
  
- 2016                 Advisor to the Alliance of Automobile Manufacturers on  
The Impact of Safety Recall Legislation in the Automobile Industry.
  
- 2015 – 2016         Advisor to Sprint Corporation on  
The Design of Regulatory Policy for Business Data Services.
  
- 2014 – 2015         Advisor and Expert Witness for Norfolk Southern Corporation on  
The Design of Regulatory Policy in the Railroad Industry.
  
- 2014 – 2015         Advisor and Expert Witness for DISH Network on  
The Design of Competition Policy in Broadband and Media Markets.
  
- 2014 – 2015         Advisor to EPCOR Utilities Incorporated on  
The Design of Performance Based Regulation in the Energy Sector.
  
- 2014                 Advisor to COFETEL, Mexico's Telecommunications Regulator on  
Price Cap Regulation in Mexico's Telecommunications Industry.
  
- 2013 – 2014         Advisor and Expert Witness for the Alliance of Automobile  
Manufacturers on Warranty Repair Compensation Policy.
  
- 2013                 Advisor to AT&T on  
The Design of Spectrum Auctions.
  
- 2013                 Advisor to the National Grid Service Company on  
The Design of Service Quality Standards in the Electricity Sector.

**SELECTED ADDITIONAL EXPERIENCE (CONTINUED):**

- 2013 Advisor to Telefonica on  
The Design of Price Cap Regulation in Peru.
- 2011 Advisor to Leap Wireless International on  
Competition Policy in the Wireless Communications Industry.
- 2011 Advisor to Telstra Corporation, Ltd. on the Design of  
Access Pricing Policy in Australia’s Telecommunications Industry.
- 2010 Advisor to COFETEL on  
Competition Policy in Mexico’s Communications Industry.
- 2010 Advisor to the U.S. Federal Communications Commission on  
Incentive Regulation and Broadband Deployment.
- 2009 Advisor to the OECD on  
Competition Policy in Mexico’s Communications Industry.
- 2009 Advisor to Afilias on the Design of Policy to  
Assign Internet Names and Addresses.
- 2008 – 2009 Advisor and Expert Witness for AT&T on the  
Design of Competition Policy in the U.S. Telecommunications Industry.
- 2008 Member of Advisory Committee to the “Electronic Health Information  
Exchange Project,” sponsored by the National Governors Association.
- 2008 Advisor to United States Cellular Corporation on the  
Design of Telecommunications Universal Service Policy.
- 2007 – 2008 Advisor to United Parcel Service on the  
Design of Regulatory Policy in the Postal Industry.
- 2006 – 2007 Advisor to Earthlink, Inc. on the Design of  
Telecommunications and Internet Competition Policy.
- 2006 – 2007 Advisor to Telstra Corporation, Ltd. on the Design of  
Competition Policy in Australia’s Telecommunications Industry.
- 2005 – 2006 Advisor to General Communication, Inc. on the  
Design of Telecommunications Competition Policy.
- 2005 Advisor to United Parcel Service on  
Competition Policy in the U.S. Postal Industry.

**SELECTED ADDITIONAL EXPERIENCE (CONTINUED):**

- 2004 – 2005      Advisor to the Antitrust Division of the U.S. Department of Justice on Competition Policy in the Telecommunications Industry.
- 2004              Advisor to OSIPTEL, Peru’s Telecommunications Regulatory Agency, on the Design of Price Cap Regulation.
- 2003 – 2004      Advisor to SBC, Inc. on the Design of Performance Measurement Systems in the U.S. Telecommunications Industry.
- 2003              Presented Invited Testimony to the President’s Commission on the United States Postal Service.
- 2003              Advisor to General Communication, Inc. on the Design of Universal Service and Competition Policy.
- 2001              Advisor to CONATEL, Ecuador’s Central Regulatory Body on the Design of Telecommunications Policy.
- 2000 – 2001      Advisor to Ameren UE on the Design of Incentive Regulation for Electric Utilities.
- 1999 – 2000      Advisor to the Antitrust Division of the U. S. Department of Justice on a Proposed Merger in the Communications Industry.
- 1998 – 2000      Consultant and Expert Witness for United Parcel Service on Postal Industry Pricing.
- 1998 – 2000      Advisor to the World Bank on Telecommunications Privatization in Africa.
- 1996              Consultant and Expert Witness for TELUS Communications, Inc. on the Design of Price Cap Regulation.
- 1995              Advisor and Expert Witness for GTE-California on Incentive Regulation and Telecommunications Competition Policy.
- 1992 – 1994      Advisor to the Southern Bell Telephone Company on the Design of Incentive Regulation.
- 1992              Advisor to the New York State Public Service Commission on Incentive Regulation in the Electric Power Industry.