

1900 K Street, NW
Washington, DC 20006-1110
+1 202 261 3300 Main
+1 202 261 3333 Fax
www.dechert.com

STEVEN G. BRADBURY

steven.bradbury@dechert.com
+1 202 261 3483 Direct
+1 202 261 3183 Fax

October 9, 2015

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

**Re: NTCH Inc. v. Cellco Partnership d/b/a Verizon Wireless, EB Docket No. 14-212, File
No. EB13-MD-006**

Dear Ms. Dortch:

I am enclosing for filing in the above proceeding the Response Brief for Verizon and the supporting Declaration of Dr. Hal J. Singer. Please contact me if you have any questions regarding this filing.

Very truly yours,



Steven G. Bradbury

SGB
Enclosures

Andre J. Lachance
Assistant General Counsel



October 9, 2015

1300 I Street, NW
Suite 400 West
Washington, DC 20005

Phone 202. 515.2439
Fax 202.289.6781
andy.lachance@verizon.com

CONFIDENTIAL AND HIGHLY CONFIDENTIAL MATERIAL ENCLOSED

Marlene H. Dortch
Secretary
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20554

ATTN: Rosemary McEnery
Deputy Chief
Market Disputes Resolution Division
Enforcement Bureau
Federal Communications Commission
445 12th Street, S.W.
Washington, DC 20554

Re: ***NTCH, Inc. v. Cellco Partnership d/b/a Verizon Wireless***
EB Docket No. 14-212; File No. EB-13-MD-006
Verizon Request for Confidential Treatment

Dear Ms. Dortch:

Verizon hereby requests confidential treatment of documents and information provided in and with the attached Response Brief and Declaration of Dr. Hal J. Singer. We seek confidential treatment of these materials pursuant to the protective order adopted by the Enforcement Bureau,¹ and sections 0.457(d)(2), 0.457(g)(3), 0.459 and 1.731 of the Commission's Rules, 47 C.F.R. §§ 0.457(d)(2), 0.457(g)(3), 0.459, 1.731. Accordingly, these materials may be used and disclosed solely in accordance with the limitations and procedures of 47 C.F.R. §§ 1.731(b)-(e).

The documents and information for which Verizon seeks confidentiality fall squarely within the requirements of Section 0.459 of the Commission's rules, and disclosure of this information would result in competitive harm to Verizon. In support of this request, Verizon provides the following information pursuant to Sections 0.457(d)(2) and 0.459(b) of the Commission's Rules.

¹ Protective Order, EB Docket No. 14-212, File No. EB-13-MD-006 (Jun. 17, 2015).

1. Extent of Nondisclosure Requested. Verizon is requesting confidential treatment for all documents marked as “Confidential” and “Highly Confidential” as well as information designated “[BEGIN CONFIDENTIAL]” and “[END CONFIDENTIAL]” and “[BEGIN HIGHLY CONFIDENTIAL]” and “[END HIGHLY CONFIDENTIAL],” in the Response Brief and associated Declaration. The documents and information subject to this request generally relate to commercial negotiations and arrangements between Verizon and NTCH, Inc. (“NTCH” or “Complainant”), and to commercial arrangements between Verizon and other entities, that are subject to non-disclosure agreements or that Verizon does not otherwise disclose publicly.
2. Proceeding/Reason for Submission. Verizon is submitting the enclosed information pursuant to Section 1.732 of the Rules, 47 C.F.R. § 1.732, and in accordance with the Enforcement Bureau’s August 12, 2015 letter to Verizon and NTCH in the above-referenced proceeding.
3. Nature of Confidential Information. The information contains commercially sensitive information that may be withheld from public disclosure under FOIA Exemption 4. The Commission has long recognized that, for purposes of Exemption 4, “records are ‘commercial’ as long as the submitter has a commercial interest in them.” *Robert J. Butler*, 6 FCC Rcd 5414, 5415 (1991), citing *Public Citizen Health Research Group v. F.D.A.*, 704 F.2d 1280, 1290 (D.C. Cir. 1983); *American Airlines v. National Mediation Board*, 588 F.2d 863, 868 (2d Cir. 1978). The information is clearly “commercial”² in nature. It includes information relating to Verizon’s roaming pricing and agreements, wholesale relationships, Verizon’s business practices and methods, and commercially sensitive and confidential agreements with Defendant and other parties. Further, the documents are plainly “confidential” in that they “would customarily not be released to the public.”³ Courts have elaborated that material “is ‘confidential’ . . . if disclosure of the information is likely to have *either* of the following effects: (1) to impair the government’s ability to obtain necessary information in the future; *or* (2) to cause substantial harm to the competitive position of the person from whom the information was obtained.”⁴ Both of these considerations plainly apply in this instance, as further explained in point (5) below.
4. Competitiveness of Market. The commercial information provided derives from and relates to Verizon’s provision of mobile wireless services and thus

²See *Board of Trade v. Commodity Futures Trading Comm’n*, 627 F.2d 392, 403 & n.78 (D.C. Cir. 1980) (courts have given the terms “commercial” and “financial,” as used in Section 552(b)(4), their ordinary meanings).

³*Critical Mass Energy Project v. NRC*, 975 F.2d 871, 873 (D.C. Cir. 1992), *cert. denied*, 113 S. Ct. 1579 (1993).

⁴*National Parks and Conservation Ass’n v. Morton*, 498 F.2d 764, 770 (D.C. Cir. 1974) (footnote omitted) (emphasis added); see also *Critical Mass Energy Project v. NRC*, 975 F.2d 871 (D.C. Cir. 1992), *cert. denied*, 113 S. Ct. 1579 (1993).

concerns a service “that is subject to competition,” 47 C.F.R. § 0.459(b)(4). *See, e.g., Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services*, 28 FCC Rcd 3700 (2013).

5. Harm from Disclosure. The commercial information in the enclosed documents is confidential because its release would likely cause competitive harm to Verizon. The information is clearly commercial in nature. Further, the documents are plainly “confidential” in that they “would customarily not be released to the public.”⁵ Further, evidence revealing “[a]ctual competition and the likelihood of substantial competitive injury” is sufficient to bring commercial information within the realm of confidentiality.⁶ The Commission has recognized that disclosure of information relating to pricing, costs, business practices and methods and related information to competitors can cause competitive harm, and is thus competitively sensitive and subject to Exemption 4.⁷
6. Measures Taken to Prevent Unauthorized Disclosure. Verizon treats the documents and information subject to this request as confidential and subject to non-disclosure agreements, and does not publicly disclose this information. Verizon also limits the internal circulation of this information to only those with a need-to-know.
7. Public Availability and Previous Disclosure to Third Parties. The documents for which confidentiality is sought are not made available to the public and have not been disclosed to parties other than NTCH. Documents disclosed to NTCH have been subject to non-disclosure agreements.
8. Requested Duration of Nondisclosure. The enclosed information should never be released for public inspection, as it contains commercially sensitive, confidential information, the release of which could adversely affect Verizon’s competitive position.

For the foregoing reasons, Verizon respectfully requests that the Commission withhold these documents and information from public inspection, subject to the safeguards of section 1.731 of the Rules.

⁵*Critical Mass Energy Project v. NRC*, 975 F.2d 871, 873 (D.C. Cir. 1992), *cert. denied*, 113 S. Ct. 1579 (1993) (citing the Senate Committee Report).

⁶ *Public Citizen Health Research Group*, 704 F.2d at 1291, quoting *Gulf & Western Industries v. U.S.*, 615 F.2d 527, 530 (D.C. Cir. 1979).

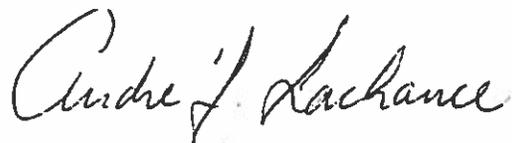
⁷ *See, e.g., Josh Wein, Warren Communications News, Request for Inspection of Records*, Memorandum Opinion and Order, 24 FCC Rcd 12347, 12352-53 (2009).

October 9, 2015

Page 4

Should you need additional information with regard to this request, please contact the undersigned at (202) 515-2439.

Respectfully submitted,

A handwritten signature in black ink that reads "Andre J. Lachance". The signature is written in a cursive style with a large initial "A" and "L".

Andre J. Lachance
1300 I Street, N.W.
Suite 400 West
Washington, DC 20005
(202) 515-2400

Attorney for Verizon Wireless

CONFIDENTIAL TREATMENT
REQUESTED

**Pursuant to Sections 0.457(d) and 0.459(a)(b)
of the Commission's Rules.**

REDACTED FOR PUBLIC INSPECTION

**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, DC 20554**

In the Matter of)
)
)
NTCH, Inc., for and on behalf) EB Docket No. 14-212
of its Operating Subsidiaries,) File No. EB-13-MD-006
)
Complainant,)
)
)
v.)
)
Cellco Partnership d/b/a Verizon Wireless,)
and its Operating Subsidiaries,)
)
)
Defendant.)
)

RESPONSE BRIEF FOR VERIZON

Kathleen M. Grillo
Christopher M. Miller
Tamara L. Preiss
Andre J. Lachance
VERIZON
1300 I Street, N.W.
Suite 400 West
Washington, D.C. 20005
(202) 515-2400

Steven G. Bradbury
Hrishikesh Hari
DECHERT LLP
1900 K Street, N.W.
Washington, D.C. 20006
(202) 261-3483

Counsel for Verizon

October 9, 2015

REDACTED

REDACTED FOR PUBLIC INSPECTION

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION AND SUMMARY.....	1
FACTUAL BACKGROUND.....	3
LEGAL ARGUMENT.....	9
I. The Commission’s Roaming Standards Are Satisfied When Carriers Offer Rates that Fall Within the Range of Comparable Rates Negotiated with Other Carriers and that Preserve Both Parties’ Investment Incentives.....	9
II. Verizon Negotiated in Good Faith and Offered NTCH Reasonable Roaming Rates that Fully Accord with the Requirements of the Commission’s Roaming Rules.....	13
III. NTCH’s Contrary Legal Arguments Are Inconsistent with the Commission’s Roaming Orders, and the Commission Should Reject Them	16
A. NTCH’s Pleas for Cost-Based Rate Regulation and Uniform Tariffs for Roaming Fly in the Face of the Commission’s Previous Orders.....	16
B. NTCH’s Effort to Cap Roaming Rates Based on Retail and Wholesale Pricing Improperly Applies the Wireless Bureau’s <i>Declaratory Ruling</i>	17
C. NTCH’s Assertions that Verizon Engaged in a “Restraint of Trade” Are Baseless.....	21
CONCLUSION.....	23
PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW	24

REDACTED FOR PUBLIC INSPECTION

**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, DC 20554**

In the Matter of)	
)	
NTCH, Inc., for and on behalf)	EB Docket No. 14-212
of its Operating Subsidiaries,)	File No. EB-13-MD-006
)	
Complainant,)	
)	
v.)	
)	
Cellco Partnership d/b/a Verizon Wireless,)	
and its Operating Subsidiaries,)	
)	
Defendant.)	

RESPONSE BRIEF FOR VERIZON

The Commission should dismiss NTCH’s Amended Complaint and declare that the roaming rates in Verizon’s last offer to NTCH are reasonable and satisfy the Commission’s roaming orders.

INTRODUCTION AND SUMMARY

NTCH’s Amended Complaint is baseless. Verizon has not refused to offer roaming services to NTCH and acted promptly and in good faith throughout the parties’ negotiations. The roaming rates Verizon offered NTCH are well within the range (indeed, near the low end of the range) of comparable roaming rates—including both the rates Verizon pays and the rates Verizon receives—under arm’s-length roaming agreements negotiated with others. Verizon’s rates appropriately preserve incentives to continue to invest in network improvements. Verizon thus satisfied the Commission’s standards, and its offered rates are “commercially reasonable”

REDACTED

REDACTED FOR PUBLIC INSPECTION

within the meaning of the Commission's *Data Roaming Order* and "reasonable and not unreasonably discriminatory" as required by the Commission's *Voice Roaming Orders*.

The rates NTCH demands, on the other hand, are divorced from the Commission's standards. They are far below the range of comparable rates other carriers pay to roam on Verizon's world-class network and, if adopted, would extinguish NTCH's incentives to expand its network facilities. If the Commission ordered Verizon to accept the below-market rates NTCH demands, these rates would also seriously undermine Verizon's incentives to continue to make capital investments in new network technology and infrastructure.

The Commission should reject NTCH's misguided legal positions. NTCH's argument for cost-based rate regulation of roaming services is contrary to the long-settled regulatory judgment of the Commission, as established in the roaming orders. And its pleas for roaming rates keyed to particular retail pricing plans or to the lowest wholesale rates Verizon provides to a mobile virtual network operator ("MVNO") misunderstand the fundamentals of retail and wholesale pricing and misapply the Wireless Bureau's December 2014 *Declaratory Ruling*. NTCH's musings about asserted competitive effects and "restraint of trade" lack a foundation in fact and fail to raise a claim proper for resolution in this proceeding.

In support of this brief and to assist the Commission, Verizon offers the accompanying Declaration of Dr. Hal J. Singer, a principal at Economists Incorporated and an expert in the economics of telecommunications networks and regulation. Dr. Singer addresses the economic considerations that distinguish roaming arrangements from a wireless carrier's retail pricing and wholesale service—considerations that should guide a proper application of the Wireless Bureau's *Declaratory Ruling*. And he explains the economic principles supporting the Commission's roaming standards and why, from an economic perspective, the rates Verizon

REDACTED FOR PUBLIC INSPECTION

offered NTCH represent the fair market value of roaming on Verizon's network as measured against market comparable rates.¹

FACTUAL BACKGROUND

NTCH holds several spectrum licenses across multiple States, and it markets its wireless service under one or more brand names, including "ClearTalk." NTCH currently provides facilities-based wireless service for retail customers in [BEGIN CONFIDENTIAL] [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED] [END CONFIDENTIAL]² Verizon is a national facilities-based wireless provider that invested approximately \$100 billion to build a high-quality nationwide wireless network using CDMA and LTE technologies.

NTCH and Verizon entered into a voice roaming agreement on May 16, 2006, that remains in effect. The parties' existing agreement provides for voice roaming at a rate of [BEGIN CONFIDENTIAL] [REDACTED]

[REDACTED] [END CONFIDENTIAL] The current agreement does not cover data roaming.³

¹ Declaration of Hal J. Singer ¶ 2 (Oct. 9, 2015), EB Dkt. No. 14-212 (filed Oct. 9, 2015), appended hereto as Exhibit A ("Singer Decl."). Because the Wireless Bureau's *Declaratory Ruling* was decided after Verizon's Answer to the Amended Complaint in this proceeding, Verizon's submission of the Singer Declaration in support of the present brief is proper under section 1.732(b) of the Commission's rules.

² Joint Statement of NTCH and Verizon, Joint Statement of Stipulated Facts ¶ 4, File No. EB-13-MD-006 (filed Sept. 30, 2014) ("Jt. Stip."). In its Initial Brief, NTCH states that it [BEGIN CONFIDENTIAL] [REDACTED] [END CONFIDENTIAL] See Initial Brief of NTCH, Inc. at 1, EB Dkt. No. 14-212 (filed Sept. 18, 2015) ("NTCH Br.") NTCH's wireless licenses are listed in Attachment A to the Legal Analysis of Verizon Wireless, File No. EB-13-MD-006, which NTCH has stipulated is substantially accurate. Jt. Stip. ¶ 5.

³ Jt. Stip. ¶ 1.

REDACTED FOR PUBLIC INSPECTION

At NTCH's request, the parties began negotiating a revised roaming agreement for voice, data, and short message service ("SMS" or text messages) in October 2011. The parties jointly stipulated that "[a]t all times during the negotiations, Verizon [has] responded promptly to offers, correspondence and phone calls from NTCH."⁴

On October 17, 2011, NTCH proposed roaming rates of [BEGIN CONFIDENTIAL]

[REDACTED] [END CONFIDENTIAL] NTCH followed with a letter on October 18, 2011, reciting the same proposed terms and also proposing alternative rates of [BEGIN CONFIDENTIAL] [REDACTED]

[REDACTED] [END CONFIDENTIAL]⁵

Verizon responded on November 9, 2011, with a counteroffer of [BEGIN CONFIDENTIAL] [REDACTED]

[REDACTED] [END CONFIDENTIAL]⁶

NTCH did not make a counterproposal to Verizon for nearly six months, until May 23, 2012, when it demanded even lower roaming rates than it proposed in October 2011: [BEGIN

⁴ Jt. Stip. ¶ 2. Except where indicated, the summary of the parties' negotiations set forth herein is based on the facts recited in Jt. Stip. ¶ 6.

⁵ Throughout the negotiations and this proceeding, NTCH has expressed data roaming rates on a per-gigabyte ("GB") basis (sometimes mistakenly referred to as "gigabit"), rather than the per-MB measurement most often used in connection with roaming. Verizon has converted all of NTCH's per-GB demands into approximate per-MB rates by dividing them by 1024.

⁶ Since both parties proposed that SMS roaming would be provided [BEGIN CONFIDENTIAL] [REDACTED] [END CONFIDENTIAL], there is currently no disputed issue for the Commission to decide with respect to the SMS roaming rate, and Verizon will omit further references to SMS, except as necessary.

CONFIDENTIAL] [REDACTED] [END

CONFIDENTIAL] Verizon countered on June 1, 2012, with an offer of [BEGIN

CONFIDENTIAL] [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] [END CONFIDENTIAL]

NTCH did not communicate again with Verizon for three months, until September 6, 2012, when it threatened litigation if Verizon did not respond further by September 13, 2012. Verizon replied to NTCH's threat on September 13, 2012, by noting that NTCH had not yet responded to Verizon's June 1, 2012 counteroffer and seeking a response to that counteroffer.⁷

On November 1, 2012, five months after Verizon's last counteroffer, NTCH again proposed roaming rates of [BEGIN CONFIDENTIAL] [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] [END

CONFIDENTIAL] Eight days later, on November 9, 2012, Verizon responded to NTCH's proposal by offering [BEGIN CONFIDENTIAL] [REDACTED] [END

CONFIDENTIAL]

On December 6, 2012, NTCH repeated its previous rate demands but included a proposal of [BEGIN CONFIDENTIAL] [REDACTED]

[REDACTED]

⁷ Declaration of Joseph A. Trent (Aug. 4, 2014) ("Trent Decl.") ¶ 8, appended as Tab G to the Verizon Wireless Answer, File No. EB-13-MD-006 (filed Aug. 4, 2014) ("Verizon Answer").

REDACTED FOR PUBLIC INSPECTION

[REDACTED]

[REDACTED] **[END CONFIDENTIAL]**

On January 25, 2013, Verizon and NTCH participated in an informal meeting with the Enforcement Bureau staff in which the parties agreed that negotiations had stalled. At that meeting, NTCH expressed interest in exploring the possibility of becoming an MVNO to resell Verizon service. In response, Verizon arranged for NTCH to discuss potential MVNO terms with Verizon's wholesale group, but NTCH decided that it could not meet the minimum volume commitments for the wholesale pricing it wanted. Verizon then referred NTCH to an aggregator to explore aggregating its traffic together with other resellers, but nothing came of that option.

On October 29, 2013, more than nine months after the meeting with Enforcement Bureau staff, Verizon received a letter from NTCH. The letter said NTCH intended to file a formal complaint asking for roaming rates not to exceed **[BEGIN CONFIDENTIAL]** [REDACTED]

[REDACTED] **[END CONFIDENTIAL]**

On the same day NTCH filed its initial formal complaint, November 22, 2013, Verizon proposed roaming rates of **[BEGIN CONFIDENTIAL]** [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] **[END CONFIDENTIAL]**

Verizon followed this proposal on December 9, 2013, offering NTCH **[BEGIN CONFIDENTIAL]** [REDACTED]

[REDACTED]

[REDACTED] [END CONFIDENTIAL]

NTCH rejected all of Verizon's offers by e-mail on December 10, 2013.

Thereafter, at the request of the Enforcement Bureau staff, the parties agreed to participate in another staff-assisted mediation and to hold the complaint proceeding in abeyance pending mediation.

In connection with the mediation in March 2014, the parties made a series of additional offers and counteroffers—including non-roaming proposals—but this back-and-forth exchange of offers did not result in agreement.⁸

NTCH filed its Amended Complaint on July 2, 2014. In its Amended Complaint, NTCH asks for an order from the Commission requiring Verizon to provide roaming to NTCH at

[BEGIN CONFIDENTIAL] [REDACTED]

[REDACTED] [END CONFIDENTIAL]

In the parties' Joint Statement, NTCH identified the rates requested in its Amended Complaint as its latest demands. Verizon identified its last offer as: [BEGIN

CONFIDENTIAL] [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] [END CONFIDENTIAL]⁹

At the time it filed its Answer to the Amended Complaint, on August 4, 2014, the roaming rates it offered to NTCH were equal to or lower than the roaming rates in [BEGIN

CONFIDENTIAL] [REDACTED]

⁸ The specific terms of these offers and counteroffers are detailed in the parties' Jt. Stip. ¶ 6.

⁹ Jt. Stip. ¶ 3.

[REDACTED]

[REDACTED] [END CONFIDENTIAL]

And the roaming rates NTCH demanded were lower than the roaming rates in [BEGIN

CONFIDENTIAL] [REDACTED]

[REDACTED] [END CONFIDENTIAL] These include both the rates other carriers pay Verizon *and the rates Verizon pays* for CDMA roaming services, including under contracts where Verizon is the net payer for roaming.¹⁰

As described in NTCH's Initial Brief, NTCH made a "best and final offer" on August 31, 2015, in which it demanded roaming rates from Verizon of [BEGIN CONFIDENTIAL]

[REDACTED] [END CONFIDENTIAL]

NTCH's "best and final offer" also proposed [BEGIN CONFIDENTIAL] [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[END CONFIDENTIAL]¹¹

On August 17, 2015, Verizon responded to NTCH's Supplemental Interrogatories by producing an updated chart that shows the terms of the other CDMA-only roaming agreements currently in effect between Verizon and other facilities-based wireless carriers.¹² The August 17,

¹⁰ See Trent Decl. ¶¶ 16-20. The other CDMA-only roaming agreements identified by Verizon exclude [BEGIN CONFIDENTIAL] [REDACTED]

[REDACTED] [END CONFIDENTIAL] See *id.* ¶ 16; see also Exhibit A to Verizon's Response to NTCH Interrogatories, EB Dkt. No. 14-212 (filed Apr. 27, 2015).

¹¹ NTCH Br. 3.

¹² See Exhibit A to Verizon's Response to NTCH Supplemental Interrogatories, EB Dkt. No. 14-212 (filed Aug. 17, 2015) ("Supplemental Response").

REDACTED FOR PUBLIC INSPECTION

through below-market roaming. The *Data Roaming Order* establishes a standard of good faith negotiation and “commercially reasonable terms and conditions,”¹⁴ and the *Voice Roaming Orders* require that carriers offer voice roaming rates that are “reasonable and not unreasonably discriminatory.”¹⁵

In judging the reasonableness of roaming rates under the Commission’s standards, arm’s-length roaming agreements entered into between the parties or with other carriers in the marketplace provide the most appropriate benchmarks. The “commercial reasonableness” standard gives carriers “flexibility” to “negotiate different terms and conditions on an individualized basis, including prices, with different parties.” In evaluating proffered rates, the Commission looks to “whether the parties have any roaming arrangements with each other . . . and the terms of those arrangements” and any “previous data roaming arrangements with similar terms.”¹⁶ And the standard for voice roaming ensures “that the rates individual carriers pay for automatic roaming services [will] be determined in the marketplace through negotiations between the carriers,” based on the Commission’s “preference for allowing competitive market forces to govern rate and rate structures,” thereby fostering “a variety” of “reasonable pricing plans and service offerings.”¹⁷

The roaming orders thus expressly anticipate variations in negotiated rates depending on the circumstances and business needs of different carriers. Contrary to NTCH’s arguments, the

¹⁴ See *In the Matter of Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers and Other Providers of Mobile Data Services*, Second Report and Order, 26 FCC Rcd. 5411 ¶¶ 1, 13, 42, 68, 85-86 (2011) (“*Data Roaming Order*”); 47 CFR § 20.12(e)(1).

¹⁵ See *In the Matter of Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers and Other Providers of Mobile Data Services*, 25 FCC Rcd. 4181 ¶ 18 (2010) (“*2010 Voice Roaming Order*”); 47 CFR § 20.12(d).

¹⁶ *Data Roaming Order* ¶¶ 45, 68, 86.

¹⁷ *In the Matter of Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers*, 22 FCC Rcd. 15817 ¶¶ 35, 37 (2007) (“*2007 Voice Roaming Order*”).

REDACTED FOR PUBLIC INSPECTION

Commission's standards do not mandate any particular roaming rates, whether based on retail pricing, wholesale rates, or a cost-of-service estimate.¹⁸ The Commission repeatedly "decline[d] to impose a price cap or any other form of rate regulation on the fees carriers pay each other when one carrier's customer roams on another carrier's network."¹⁹

Evaluating rate offers by reference to the range of comparable commercial roaming contracts negotiated with other carriers in the market is fundamental to preserving the parties' incentives to invest in their networks. The Commission recognized that a "potential cost" of obligatory roaming arrangements "is the possibility that requesting providers will substitute roaming for investment in coverage and accordingly under-invest in deploying new infrastructure."²⁰ By "obligat[ing] the host provider only to offer data roaming on commercially reasonable terms and conditions," the Commission intended to "provide the requesting provider with sufficient incentive to invest in facilities" wherever economically feasible and to ensure "that the data roaming obligation does not create mandatory resale obligations."²¹

The Commission concluded that encouraging investment in broadband networks by all facilities-based carriers, large and small, is pro-competitive.²² In reaching that conclusion, the Commission acknowledged that "the relatively high price of roaming compared to providing facilities-based service" (*i.e.*, retail or wholesale rates) is often appropriate "to counterbalance

¹⁸ See NTCH Br. 4-10; Amended Complaint ¶¶ 23, 25-30, 33-36.

¹⁹ *2007 Voice Roaming Order* ¶ 37; see *id.* ¶ 39 ("Capping roaming rates by tying them to a benchmark based on larger carriers' retail rates may diminish larger carriers' incentives to lower retail prices" and "may also give smaller regional carriers an incentive to reduce, or even eliminate, the discounts they offer on regional calling plans.").

²⁰ *Data Roaming Order* ¶ 34.

²¹ *Id.*

²² See *id.* ¶¶ 16, 21 & n.76; see *2007 Voice Roaming Order* ¶ 40 ("regulation to reduce roaming rates has the potential to deter investment in network deployment by impairing buildout incentives facing both small and large carriers").

REDACTED FOR PUBLIC INSPECTION

the incentive to scale back deployments in favor of relying on another provider's network."²³ At the same time, the Commission found that "a general requirement of commercial reasonableness" based on market rates, "rather than a more specific prescriptive regulation of rates," will preserve "incentives for host providers to invest and deploy advanced data networks," a strongly pro-competitive result.²⁴

For these reasons, in all its roaming orders, the Commission "continue[d] to support the goal of promoting facilities-based competition by providing incentives for carriers to construct wireless network facilities on the spectrum available to them."²⁵ The *Data Roaming Order* thus provides that the Commission will consider: (1) "the extent and nature of providers' build-out"; (2) the economic feasibility of building another network in the particular geographic area; (3) "whether the requesting carrier is seeking data roaming for an area where it is already providing facilities-based service"; (4) "the impact of the terms and conditions on the incentives of either provider to invest in facilities and coverage, services, and service quality"; and (5) "whether there are other options for securing a data roaming arrangement in the areas subject to negotiations," including whether "alternative data roaming partners are available."²⁶

The commercial reasonableness analysis will also consider "the level of competitive harm in a given market and the benefits to consumers" likely to result from the terms and

²³ *Data Roaming Order* ¶ 51; see *2007 Voice Roaming Order* ¶ 40 ("enabling smaller regional carriers to offer their customers national roaming coverage at more favorable rates without having to build a nationwide network . . . would tend to diminish smaller carriers' incentives to expand the geographic coverage of their networks").

²⁴ *Data Roaming Order* ¶ 21; see *2007 Voice Roaming Order* ¶ 40 ("reducing or eliminating any competitive advantage gained as a result of building out nationwide or large regional networks . . . would impair larger carriers' incentives to expand, maintain, and upgrade their existing networks").

²⁵ *2010 Voice Roaming Order* ¶ 18.

²⁶ *Data Roaming Order* ¶ 86. Consistent with the emphasis on negotiated agreements, the Commission's roaming orders respect existing contracts entered into by the parties and treat the roaming rates and other terms and conditions established in those contracts as presumptively valid and binding. *Id.* ¶ 81.

conditions the parties propose or from the refusal to enter into a roaming arrangement.²⁷ The reference to “a given market” makes clear that any party challenging proffered rates based on alleged “competitive harm” must come forward with evidence of concrete harm to competition in one or more specific, properly defined local markets for wireless service. A party cannot rely on general or amorphous claims that proffered rates will harm competition or disadvantage a particular competitor. And to consider competition and consumer benefits the Commission also must encourage rates that maintain the parties’ incentives to invest in their own network infrastructure.

Each of the factors enumerated in the Commission’s orders points to the reasonableness of Verizon’s offers, and each undercuts NTCH’s unsupported assertions that the radically low roaming rates it demands are required to preserve or promote “competition.” NTCH’s proposed rates and the legal arguments advanced in its Initial Brief are contrary to the principles enunciated in the roaming orders.

II. Verizon Negotiated in Good Faith and Offered NTCH Reasonable Roaming Rates that Fully Accord with the Requirements of the Commission’s Roaming Rules.

Verizon complied with the requirements of the Commission’s roaming orders throughout its negotiations with NTCH, and the roaming rates Verizon offered NTCH are reasonable and consistent with the Commission’s roaming rules and orders. Verizon did not refuse to negotiate in good faith for a new roaming agreement with NTCH, and it responded promptly to each of NTCH’s demands. To reach a compromise and accommodate NTCH, Verizon offered roaming rates lower than the parties’ current contract provides and well within the range of roaming rates negotiated with other carriers for both inbound and outbound roaming.

²⁷ *Id.* ¶ 86.

REDACTED FOR PUBLIC INSPECTION

Under the Commission's orders, the range of comparable roaming rates found in commercial agreements negotiated on an arm's-length basis is the touchstone for judging the reasonableness of offered rates and is the most important factor in that evaluation.²⁸ The range of rates that many other carriers, both large and small, agreed to pay for roaming on Verizon is the best, most commercially relevant measure of the value that those carriers place on providing their subscribers access to the high-quality network Verizon built and operates. As Dr. Singer explains in his accompanying declaration, in economic terms, these comparable rates are the appropriate indicators of the fair market value of a roaming arrangement with Verizon and thus of the commercial reasonableness of the rates offered to NTCH.²⁹

Yet NTCH has made no effort to address Verizon's evidence of comparable roaming rates, which it describes as a "false measure."³⁰ Instead, NTCH claims that because Verizon operates the nation's largest and most extensive CDMA network, every roaming rate Verizon agreed to with any other wireless carrier must be unreasonably high and thus irrelevant. The exceptions, NTCH claims, are "those few cases where [Verizon] actually needs a roaming agreement with other carriers," where, NTCH says, "commercial reality tempers [Verizon's] normal high rates."³¹ But, as shown above and in the materials Verizon submitted in response to NTCH's interrogatories, the comparable rates in Verizon's other roaming agreements do not vary significantly between the inbound and outbound roaming traffic. And the roaming rates Verizon offered to NTCH are significantly *lower than* nearly all the roaming rates Verizon pays to other carriers, including in circumstances where Verizon is dependent on roaming and under

²⁸ See *Data Roaming Order* ¶¶ 45, 68, 86; *2007 Voice Roaming Order* ¶¶ 35, 37.

²⁹ See Singer Decl. ¶¶ 2, 8.

³⁰ NTCH Br. 7.

³¹ *Id.*

REDACTED FOR PUBLIC INSPECTION

contracts where Verizon is the *net payer* for roaming services. NTCH fails to address these dispositive facts.

NTCH's effort to divert the Commission's attention from the most relevant commercial evidence of comparable roaming rates is not surprising, since the rates NTCH demands are radically low—for data, far, far below the rates Verizon pays and receives for roaming services under any other arm's-length commercial agreement. This fact alone is sufficient to render NTCH's roaming demands unreasonable under the Commission's standards and for the Commission to dismiss the Amended Complaint. Certainly, NTCH has not come close to meeting its burden in this proceeding to establish the reasonableness of the rates it demands.

Verizon's offered rates also advance the Commission's policy goal of promoting facilities-based competition by preserving both carriers' incentives to invest in their networks.³² Conversely, forcing Verizon to provide roaming at the rates NTCH demands would undermine Verizon's incentives to invest in new technologies to improve its national network and the quality of its wireless service.³³ Because they are far below any reasonable market level, NTCH's rates would force Verizon (and Verizon's customers) to subsidize NTCH's operations letting NTCH freeload on Verizon's network as a virtual reseller. In this proceeding, NTCH thus effectively seeks "to create *de facto* mandatory resale obligations" at the lowest possible wholesale rate, a result the Commission specifically rejected in its roaming orders.³⁴

³² See *Data Roaming Order* ¶¶ 16, 21, 34, 51; *2007 Voice Roaming Order* ¶ 40; *2010 Voice Roaming Order* ¶ 18; Singer Decl. ¶¶ 24 – 26.

³³ See Singer Decl. ¶ 25. These radically low rates would also destroy whatever incentives NTCH may have to invest in network expansion, including in those out-of-market service areas where NTCH holds spectrum and says it plans to build facilities. *Id.* ¶ 26; see NTCH Br. 1 (stating that NTCH has plans to expand its network facilities).

³⁴ See *Data Roaming Order* ¶ 44 ("automatic roaming obligations can not be used as a backdoor way to create *de facto* mandatory resale obligations or virtual reseller networks") (quoting *2007 Voice Roaming Order* ¶ 51).

III. NTCH's Contrary Legal Arguments Are Inconsistent with the Commission's Roaming Orders, and the Commission Should Reject Them.

Instead of addressing the factors most relevant to a proper application of the Commission's roaming orders and rules, NTCH put forward a series of alternative legal arguments that are contrary to those orders and rules, and NTCH has failed to support these legal arguments with substantial evidence in the record.

A. NTCH's Pleas for Cost-Based Rate Regulation and Uniform Tariffs for Roaming Fly in the Face of the Commission's Previous Orders.

NTCH devotes much of its brief to arguing (once again) that the Commission should subject roaming arrangements, especially for voice roaming, to cost-based rate regulation and should require Verizon to provide roaming to all requesting carriers on the same terms and conditions—in effect, at tariffed roaming rates.³⁵

The Commission in its roaming orders rejected cost-based rate regulation for both voice and data roaming.³⁶ On that basis, the Enforcement Bureau staff correctly denied NTCH's previous request for discovery of cost information in this proceeding.³⁷ Contrary to NTCH's legal position, the “just and reasonable” standard of section 201(b) of the Communications Act does not mandate cost-based rates.³⁸ And NTCH's approach would inevitably convert every roaming rate complaint proceeding into drawn-out litigation over the intricacies of the capital and operating costs of wireless networks and the economics of network access. The Commission correctly decided against roaming cost cases years ago.

³⁵ See NTCH Br. 4-10, 18-19. NTCH has invoked its pending challenge to the Commission's decision to forbear from applying the automatic voice roaming rule to data roaming. *See id.* at 9.

³⁶ See 2007 Voice Roaming Order ¶¶ 37, 39; Data Roaming Order ¶ 86.

³⁷ Enforcement Bureau Order of [Date], EB Dkt. No. 14-212.

³⁸ See *In the Matter of Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers*, 18 FCC Rcd. 16978 ¶ 664 (2003) (affirming that carriers may establish that offered rates are “just and reasonable” in accordance with section 201(b) by reference to “arms-length agreements” negotiated “with other, similarly situated purchasing carriers”).

REDACTED FOR PUBLIC INSPECTION

Equally misplaced is NTCH's contention that Verizon's roaming rates are unreasonably discriminatory just because they vary among different carriers.³⁹ The Commission recognized that the negotiation of one-on-one roaming agreements will produce "a variety" of "reasonable pricing plans and service offerings," and the Commission approved "flexibility" to negotiate variations in roaming rates, reflecting the different needs and circumstances of different carriers.⁴⁰ The argument that section 202(a)'s prohibition on "unreasonable discrimination" mandates uniform rates for roaming is simply wrong as a matter of law. It is established law that section 202(a) does not mandate uniform rates for roaming.⁴¹

B. NTCH's Effort to Cap Roaming Rates Based on Retail and Wholesale Pricing Improperly Applies the Wireless Bureau's *Declaratory Ruling*.

In lieu of considering other roaming agreements negotiated in the marketplace, NTCH argues that the Commission should order Verizon to charge roaming rates capped by Verizon's advertised retail pricing or by the lowest wholesale rate Verizon offers to an MVNO.⁴² The retail pricing plans NTCH cites and the terms and conditions of Verizon's wholesale arrangements with large MVNOs are not appropriate reference points to judge Verizon's offered roaming rates in this case and cannot dictate a reasonable voice or data roaming rate.⁴³

These arguments misinterpret and misapply the Wireless Bureau's December 2014 *Declaratory Ruling*. The Wireless Bureau's ruling simply held that in applying the commercial

³⁹ See NTCH Br. 8, 14-22.

⁴⁰ 2007 Voice Roaming Order ¶¶ 35, 37; Data Roaming Order ¶¶ 45, 68.

⁴¹ See *Orloff v. Vodafone AirTouch Licenses LLC*, 17 FCC Rcd. 8987 ¶ 24 (2002) (section 202(a) does not require cost-justification for differences in rates, terms, and conditions), *aff'd sub nom. Orloff v. FCC*, 352 F.3d 415 (D.C. Cir. 2003).

⁴² See NTCH Br. 15-18, 19-20, 22.

⁴³ Verizon's August 17, 2015 Supplemental Response included details regarding the access fees and discounts offered to the MVNO that receives Verizon's lowest wholesale rate. Verizon's April 27, 2015 Response to NTCH Interrogatories includes the details requested by NTCH (as modified by discovery order of the Enforcement Bureau staff) concerning certain retail pricing plans offered by Verizon and volume commitments and related terms associated with the lowest wholesale rate offered by Verizon to an MVNO.

REDACTED FOR PUBLIC INSPECTION

reasonableness standard of the *Data Roaming Order* to the totality of circumstances in a particular case, it may be appropriate to consider “whether proffered roaming rates are substantially in excess of retail rates, international rates[,] MVNO/resale rates, [and] . . . domestic roaming rates as charged by other providers.”⁴⁴ The Bureau observed that substantial differences may be “potentially” relevant in a given case, or they may not be, but the *Declaratory Ruling* does not say that retail pricing or wholesale rates will be the benchmark that determines the reasonable roaming rate.⁴⁵ The ruling also does not declare that roaming rates must equal retail or wholesale rates, and it does not provide guidance on when or how it is appropriate to consider these potential reference points in a particular proceeding. And, of course, the Bureau’s ruling does not alter the Commission’s mandate that roaming policies must preserve investment incentives and not allow requesting carriers to substitute mandatory roaming for voluntary resale.

Even if comparisons to retail pricing were appropriate under certain circumstances, the individual retail plans NTCH cherry-picked do not provide a reasonable reference for judging Verizon’s offered rates in this case. Carriers typically negotiate roaming rates on a per-MB basis to compensate the host carrier for serving the sporadic, unpredictable, and situational coverage needs of the roaming carrier’s subscribers. There is no reliable, long-term stream of revenue for Verizon associated with a roaming carrier’s particular roaming customers, and there is no

⁴⁴ Wireless Bureau, *Declaratory Ruling, In the Matter of Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers and Other Providers of Mobile Data Services*, 29 FCC Rcd. 15483 ¶ 9 (2014) (“*Declaratory Ruling*”).

⁴⁵ *Id.* ¶ 17 (stating that the Commission would consider arguments as to why certain other rates would be potentially relevant as reference points, as well as why they would not be relevant); *id.* ¶ 18 (the “reference points do not function as a ceiling or as a cap on prices”). Verizon filed an application for review on January 20, 2015, challenging the *Declaratory Ruling*, and the points offered in this brief are without prejudice to Verizon’s pursuit of its application for review.

REDACTED FOR PUBLIC INSPECTION

expectation that those roaming customers will maximize their use of the Verizon network, let alone put all of their communications traffic on Verizon.

In contrast to roamers, Verizon's retail customers on average deliver a steady stream of revenue to Verizon over a long period. And they generate a large and consistent volume of traffic for Verizon because of the value they place on the communications services they pay to receive from the Verizon network. Verizon prices retail service in order to generate this reliable stream of revenue over the life of the customer relationship while maximizing the efficient use of the Verizon network. For these reasons, Verizon regularly measures and reports the revenue-generating value of its network on the basis of average monthly revenue per retail postpaid account, or "ARPA."⁴⁶ This ARPA figure is the number that Verizon uses to justify capital investments in network improvements, and it is the number that Verizon presents to Wall Street (to shareholders and potential lenders), because it accurately reflects the value that retail customers place on the high-quality wireless service they receive from Verizon.⁴⁷

For these reasons, as Dr. Singer explains, any appropriate comparison of retail pricing to roaming rates must take into account the opportunity cost (the lost stream of net revenue) to the host carrier if the roaming carrier were able to win away the host carrier's retail customers through the use of roaming.⁴⁸ None of NTCH's simplistic per-GB retail pricing calculations takes into account this opportunity cost, and the Commission should reject NTCH's attempt to benchmark roaming rates by reference to putative retail "rates." Even on its own terms, NTCH's

⁴⁶ See 2014 Verizon Annual Report, p.18, available at www.verizon.com/about/sites/default/files/2014_vz_annual_report.pdf (reporting ARPA of \$159.86 for Verizon retail postpaid wireless accounts in 2014); Singer Decl. ¶ 31.

⁴⁷ Verizon generally does not calculate wireless revenue from retail plans on a per-MB basis for network planning or financial accounting purposes.

⁴⁸ See Singer Decl. ¶ 11 (In the retail context, "each customer makes a discrete choice to subscribe to a single carrier. To the extent that roaming access—or more precisely, an expanded footprint of a roaming carrier—alters this choice, one would expect this opportunity cost to be reflected in the roaming rate.").

REDACTED FOR PUBLIC INSPECTION

attempt to construct a pro-forma measure of retail rates to compare to Verizon’s offered roaming rates makes no sense, in part because NTCH’s calculation assumes 24 hours per day of voice usage plus 12 GBs per quarter of additional data traffic (implausible for any single smartphone user).⁴⁹

Similarly, NTCH’s attempt to use wholesale rates offered to MVNOs as a cap for roaming rates is also off track. In considering the wholesale rate Verizon provides to an MVNO, the Commission should recognize, first, that there is no regulatory requirement for Verizon to give an MVNO access to its network; **[BEGIN CONFIDENTIAL]** [REDACTED]

[REDACTED] **[END CONFIDENTIAL]**⁵¹

Second, Verizon’s agreements with MVNOs have **[BEGIN CONFIDENTIAL]** [REDACTED]

[REDACTED]

⁴⁹ See NTCH Br. 15-16 (stating “we have assumed usage of the maximum number of voice minutes possible in a quarter” and showing a total of 129,600 minutes of voice use (24 hours per day for 90 days) plus 12 GBs of data traffic on top of the non-stop voice use, all of which NTCH then multiplies by Verizon’s offered rates to construct its straw man pro forma for comparison purposes); Singer Decl. ¶ 31 (see FN36 stating, “[t]o arrive at its own retail surrogate, NTCH makes equally restrictive and unsupportable assumptions on usage . . . NTCH offers no basis for its usage assumption (other than such an upgrade is available), and grounds its average price per GB to a single Verizon offering. [] The arbitrary assumptions needed to employ the retail surrogate expose its limitations as a useful valuation metric.”)

⁵⁰ See Singer Decl. ¶¶ 12 – 13.

⁵¹ See Verizon Response to Interrogatories and Supplemental Response; Singer Decl. ¶¶ 34 – 36.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[END CONFIDENTIAL] In contrast, while roaming traffic does contribute to the overall utilization of Verizon's network, it does not and cannot deliver the same sustained revenues as large national resellers.

As Dr. Singer discusses, any proper consideration of MVNO rates as a purported reference point for evaluating offered roaming rates must account for these differences.⁵² NTCH has not even tried to address these differences and so its arguments based on asserted wholesale rates are not helpful in this case, and the Commission should disregard them. And, again, in purporting to calculate a pro forma comparison of MVNO rates to roaming rates, NTCH repeats the same flawed and nonsensical assumptions that infected its calculation of retail "rates."⁵³

C. NTCH's Assertions that Verizon Engaged in a "Restraint of Trade" Are Baseless.

Finally, NTCH suggests that Verizon's rate offer in these roaming negotiations is an exercise of "monopoly power" that "restrain[s] trade" and stifles NTCH's ability to compete with large resellers and other providers.⁵⁴ It bases these assertions on the observation that Verizon has built the most extensive CDMA network with "the widest coverage nationwide."⁵⁵ While the Commission's orders permit consideration of the competitive effects of denying

⁵² See Singer Decl. ¶ 35 (stating, "critical differences make comparisons between MVNO and roaming rates particularly vexing, as the requisite *ceteris paribus* condition of market comparables is not satisfied.").

⁵³ See NTCH Br. 17-18 (repeating assumptions of 129,600 minutes of voice use in a quarter plus 12 GBs of data use).

⁵⁴ *Id.* at 26-28; *see id.* at 7, 10, 23-25.

⁵⁵ *Id.* at 7; *see id.* at 26 (referring to Verizon's "unique coverage").

REDACTED FOR PUBLIC INSPECTION

reasonable roaming, NTCH fails to offer any evidence to support a claim of competitive harm in any defined relevant market.

The fact that Verizon operates the highest-quality, most extensive CDMA network in the United States says nothing about whether NTCH has options for roaming from less extensive CDMA network carriers in any given local service area. Indeed, NTCH acknowledged both that it [BEGIN CONFIDENTIAL] [REDACTED]

[REDACTED] [END

CONFIDENTIAL]⁵⁶ By NTCH's own admission, "Sprint offers CDMA service on a national basis."⁵⁷ And other alternatives are available to NTCH to obtain roaming services through collaboration with other regional CDMA carriers.⁵⁸ For example, the Competitive Carrier Association's "Data Access Hub" is a nationwide roaming alliance that lets rural carriers and small urban carriers have roaming access to the CDMA networks of all the participating carriers, which include Sprint.⁵⁹

Even if there are distinct local service areas important to NTCH where Verizon is the only CDMA carrier, NTCH has offered no evidence showing that the rates Verizon offered effectively preclude roaming or prevent NTCH from competing effectively as a wireless provider. Verizon's proffered roaming rates will protect both parties' investment incentives and will thus enhance, not stifle, network-to-network competition among facilities-based wireless carriers, in accordance with the Commission's roaming standards and policies.

⁵⁶ See Exhibits 8 & 9, appended as Tab F to Verizon's Answer.

⁵⁷ Amended Complaint ¶ 12

⁵⁸ See Brief for Appellant NTCH, Inc. at 4, *NTCH, Inc. v. FCC*, No. 15-1145 (D.C. Cir. filed Sept. 25, 2015) (acknowledging that in addition to Verizon and Sprint, "many small and regional carriers" in the U.S. employ the same CDMA interface as NTCH).

⁵⁹ See Marguerite Reardon, *Sprint to join rural operators in nationwide roaming hub*, CNET (Mar. 26, 2014), available at <http://www.cnet.com/news/sprint-to-join-rural-operators-in-nationwide-roaming-hub/>.

CONCLUSION

For these reasons, the Commission should rule that Verizon complied with the Commission's roaming orders and that the roaming rates Verizon offered NTCH are commercially reasonable and not unreasonably discriminatory within the meaning of the Commission's roaming rules. The Commission should dismiss NTCH's Amended Complaint and reject the legal arguments made by NTCH.

Respectfully submitted,



Kathleen M. Grillo
Christopher M. Miller
Tamara Preiss
VERIZON
1300 I Street, N.W.
Suite 400 West
Washington, D.C. 20005
(202) 515-2400

Steven G. Bradbury
Hrishikesh Hari
DECHERT LLP
1900 K Street, N.W.
Washington, D.C. 20006
(202) 261-3483

Counsel for Verizon

October 9, 2015

PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW

Based on the entire record in this proceeding, Verizon respectfully proposes that the Commission adopt the following Findings of Fact and Conclusions of Law:

Findings of Fact

1. Verizon responded promptly to each proposal from NTCH concerning the terms of a potential new roaming arrangement, and Verizon acted reasonably and in good faith throughout its roaming negotiations with NTCH.
2. The parties reached an impasse in roaming negotiations due to the substantial difference between the rates NTCH demanded and the rates Verizon offered.
3. The voice roaming rate Verizon is offering to NTCH is substantially below the voice roaming rate provided in the parties' current roaming agreement.
4. All of the roaming rates Verizon is offering to NTCH are well within, and, indeed, near the bottom of, the range of other comparable roaming rates negotiated by Verizon in agreements with other CDMA wireless carriers, including both the roaming rates Verizon receives from other carriers and the roaming rates Verizon pays to other carriers, including under agreements where Verizon is the net payer.
5. The roaming rates NTCH demands are substantially below any roaming rates agreed to in any contract between Verizon and any other CDMA wireless carrier.
6. The roaming rates NTCH demands have a significant potential to undermine the parties' incentives to invest in the buildout of new wireless infrastructure and to continue to invest in improvements in existing network facilities.

Conclusions of Law

1. The data roaming rates Verizon is offering NTCH are “commercially reasonable” within the meaning of the Commission’s *Data Roaming Order* and rules, and the voice roaming rate Verizon is offering NTCH is “reasonable and not unreasonably discriminatory” within the meaning of the Commission’s *Voice Roaming Orders* and rules.

2. Verizon satisfied the requirements and standards of the Commission’s roaming orders in its negotiations with NTCH over a new roaming agreement.

3. The roaming rates NTCH demands are unreasonable and do not conform to the standards established by the Commission’s roaming orders.

4. NTCH’s plea for cost-based regulation of roaming rates is contrary to the settled standards for roaming rates established in the Commission’s roaming orders.

5. NTCH has failed to show that certain retail pricing plans or wholesale rates are relevant reference points in evaluating reasonable roaming rates in this proceeding.

6. NTCH’s assertions about the putative competitive effects of the roaming rates Verizon is offering are unsupported and do not provide any basis for relief in this proceeding.

Exhibit A

REDACTED FOR PUBLIC INSPECTION

BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, DC 20554

<hr/>)	
In the Matter of)	
)	
NTCH, Inc., for and on behalf)	EB Docket No. 14-212	
of its Operating Subsidiaries,)	File No. EB-13-MD-006	
)		
Complainant,)		
)		
v.)		
)		
Cellco Partnership d/b/a Verizon Wireless,)		
and its Operating Subsidiaries,)		
)		
Defendant.)		
<hr/>)	

DECLARATION OF DR. HAL J. SINGER

INTRODUCTION AND ASSIGNMENT

1. I have been asked by counsel for Verizon Wireless (“Verizon”) to provide an economic opinion on how to evaluate the competing offers of roaming rates in this dispute. Rather than establish an *ex ante* roaming rate by tariff, I understand that the Commission’s 2011 *Data Roaming Order* granted the parties to a roaming agreement the freedom to negotiate towards a “commercially reasonable” roaming rate, subject to an *ex post* review.¹ I also understand that the staff of the Wireless Bureau recently ruled in a 2014 Declaratory Ruling that the access provider’s retail pricing and the wholesale rate it charges to mobile virtual network operators (“MVNOs”) may be considered in some way as reference points to help inform the commercially reasonable rate “depend[ing] on the facts and circumstances of any particular case.”² The relevant question for an economist

1. See *In the Matter of Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers and Other Providers of Mobile Data Services*, Second Report and Order, 26 FCC Rcd. 5411 ¶¶ 1, 13, 42, 68, 85-86 (2011) (“*Data Roaming Order*”); 47 CFR § 20.12(e)(1).

2. Wireless Bureau, Declaratory Ruling, *In the Matter of Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers and Other Providers of Mobile Data Services*, 29 FCC Rcd. 15483 ¶ 9 (2014) (“*Declaratory Ruling*”) (“In our view, the data roaming rule was intended to permit consideration of the totality of the facts and therefore to permit a complaining party to adduce evidence in any individual case as to whether proffered roaming rates are substantially in excess of retail rates, international rates, and MVNO/resale rates, as well as a comparison of proffered roaming rates to domestic roaming rates as charged by other providers. As noted below, the probative value of these other rates as reference points will depend on the facts and circumstances of any particular case, including all of the factors set forth in the *Data Roaming Order*, and these other rates should be considered in conjunction with one another rather than in isolation.”).

REDACTED FOR PUBLIC INSPECTION

is when and how to use a “retail” or MVNO “wholesale” surrogate³ to inform the commercially reasonable standard.

2. Based on my review of the economic literature and the case materials, I offer the following opinions:

(a) In most circumstances relating to roaming arrangements between facilities-based wireless carriers, including the present one, “market comparables”—the market-determined rates arrived at by a willing buyer and seller for a comparable service—can reliably inform “fair market value” and thus the commercially reasonable roaming rate.⁴ As an economic matter, reference points such as those identified by the Wireless Bureau’s Declaratory Ruling should be given no weight in the presence of reliable market comparables. And it should come as no surprise that market comparables could be significantly higher than these reference points.

(b) Even if the Commission were to determine it appropriate to consider retail or wholesale pricing in evaluating the roaming rates offered by Verizon, these other reference points must be considered and applied in a manner consistent with economic principles and the policy objectives of the Commission’s roaming orders. For example, it is not economically meaningful to attempt to calculate a retail “rate” or consider retail pricing on a per Gigabyte (GB) basis as opposed to a per customer basis. Similarly, if the Commission must consider a wholesale surrogate in the absence of a reliable market comparable for roaming, the Commission should be cognizant of the important differences between access rates for MVNOs and roaming carriers, and even among different types of roaming carriers.

(c) Because market comparables are available in the instant dispute, and because there is no theoretical or empirical basis to mistrust those comparables, the retail and wholesale surrogates contemplated in the Declaratory Ruling provide little utility here. Accordingly, Verizon’s offer, which is grounded in market comparables, is more consistent with an economic understanding of what constitutes a commercially reasonable roaming rate.

3. Economists consider a surrogate to be a replacement or proxy, differing in kind and quality to the original which it replaces. *See, e.g.*, Kevin Caves & Hal Singer, *On the Utility of Surrogates for Rule of Reason Cases*, CPI ANTITRUST CHRONICLE (May 2015) (for an evaluation of surrogate tests used in antitrust).

4. *See, e.g.*, Faten Sabry & William Hrycay, *An Economist’s View of Market Evidence in Valuation and Bankruptcy Litigation*, May 22, 2014, available at http://www.nera.com/content/dam/nera/publications/archive2/PUB_AnalysisMarketEvidence_0614.pdf (“The fair market value is defined as the price at which an asset would change hands between a willing buyer and a willing seller when the former is not under any compulsion to buy and the latter is not under any compulsion to sell, both parties having reasonable knowledge of relevant facts. The three standard valuation approaches are the discounted cash flow approach, the market comparables approach, and the asset approach.”).

REDACTED FOR PUBLIC INSPECTION

QUALIFICATIONS

3. I am a principal at Economists Incorporated. Previously, I was a managing director at Navigant Economics, and before that, I served as president of Empiris. I have served as an adjunct professor at Georgetown's McDonough School of Business

4. I am co-author of the e-book *The Need for Speed: A New Framework for Telecommunications Policy for the 21st Century* (Brookings Press 2013), and co-author of the book *Broadband in Europe: How Brussels Can Wire the Information Society* (Kluwer/Springer Press 2005). I have published several book chapters and my articles have appeared in dozens of legal and economic journals.

5. I have testified before Congress on the interplay between antitrust and sector-specific regulation. My scholarship and testimony have been widely cited by courts and regulatory agencies. In several antitrust cases concerning class certification, the district court's order favorably cited my testimony. The FCC, the Federal Trade Commission, and the Department of Justice have cited my writings in agency reports and orders.

6. Although my consulting experience spans several industries, I have particular expertise in the media industry. I recently advised the Canadian Competition Bureau on a large vertical merger in the cable television industry. I also testified on behalf of Apple in a dispute over reasonable royalties for songs downloaded from the iTunes. I have served as consultant or testifying expert for other media companies, including AT&T, Bell Canada, Google, Mid-Atlantic Sports Network, NFL Network, Tennis Channel, and Verizon. In many of these matters, I estimated the value of licensing (or accessing) intellectual property.

7. I earned M.A. and Ph.D. degrees in economics from the Johns Hopkins University and a B.S. *magna cum laude* in economics from Tulane University.

I. MARKET COMPARABLES ARE GENERALLY THE BEST INDICATOR OF A COMMERCIALY REASONABLE RATE

8. As the "commercially reasonable" formulation indicates, a roaming rate offered by a carrier will satisfy the Commission's standards if the offered roaming rate would make commercial sense to reasonable entities. This concept of commercial reasonableness tracks closely the economic concept of fair market value, which turns on the willingness of buyers and sellers in the marketplace to consummate similar transactions. A standard approach to fair market value is the "market comparables" approach, which as the name also suggests, entails identifying comparable transactions in which similarly situated parties consummated agreements. In most cases, a market comparables approach will properly inform the commercially reasonable rate. This approach may not be available in all cases and in some cases, a market comparables approach may perpetuate inefficient outcomes, even when it is available. In these special

REDACTED FOR PUBLIC INSPECTION

cases—and only in these cases—is it appropriate to consider other potential reference points.

A. Fair Market Value and the Concept of Opportunity Cost Versus Split of Incremental Profit

9. A roaming agreement is a special relationship for access between two *facilities-based* carriers. For ease of exposition, I refer to the access provider in a roaming agreement as the “host carrier,” and the access seeker as the “roaming carrier.” A roaming carrier is distinguishable from a pure reseller, in the sense that the former invests in and relies in part on its own facilities, whereas the latter relies entirely on a third party’s network. When establishing roaming rates, a major consideration (discussed further below) is not to permit roaming rates so low as to discourage either the roaming carrier or the host carrier from continuing to invest in network expansion and improvements.

10. When assessing roaming rates, fair market value is best measured by the market-determined roaming rates entered into by similarly situated wireless carriers. The Commission has expressly recognized that market comparables are the preferred approach to determining commercially reasonable roaming rates.⁵ Moreover, it has rejected the notion of cost-based regulation and price caps.⁶

11. If granting access permits the access seeker to compete directly with the host carrier, a commercially reasonable access rate should compensate the host carrier for the forgone retail (net) revenue stream.⁷ The fundamental problem in the access-pricing process is that each customer makes a discrete choice to subscribe to a single carrier. To the extent that roaming access—or more precisely, an expanded footprint of a roaming carrier—alters this choice, one would expect this opportunity cost to be reflected in the roaming rate.

12. In contrast, when the expected revenue stream for a retail customer is *not* put at risk by a roaming agreement, a commercially reasonable rate should represent a reasonable split of the incremental profits created for the access seeker. Consider the case of an MVNO, which markets its wireless broadband service to extremely price-sensitive or budget-constrained customers who prefer pre-paid plans. Because the host carrier

5. The “commercial reasonableness” standard gives carriers “flexibility” to “negotiate different terms and conditions on an individualized basis, including prices, with different parties,” and in evaluating proffered rates, the Commission looks to “whether the parties have any roaming arrangements with each other . . . and the terms of those arrangements” and any “previous data roaming arrangements with similar terms.” See *Data Roaming Order* ¶¶ 45, 68, 86.

6. See *In the Matter of Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers and Other Providers of Mobile Data Services*, 25 FCC Red. 4181 ¶ 37 (2010) (“*2010 Voice Roaming Order*”); 47 CFR § 20.12(d); see *2010 Voice Roaming Order*, ¶ 39 (“Capping roaming rates by tying them to a benchmark based on larger carriers’ retail rates may diminish larger carriers’ incentives to lower retail prices” and “may also give smaller regional carriers an incentive to reduce, or even eliminate, the discounts they offer on regional calling plans.”).

7. For a review of efficient component pricing, see William J. Baumol & Gregory Sidak, *The Pricing of Inputs Sold to Competitors*, 11 YALE J. REG. 171 (1994).

REDACTED FOR PUBLIC INSPECTION

could not market its services to these price-sensitive customers without cannibalizing its existing offerings, by creating slightly different products, the MVNO permits the host to engage in what economists call “second-degree price differentiation.”⁸ To the extent that these customers are truly incremental to the wireless broadband operator, there is no forgone revenue stream. Because there is no need to compensate the host carrier for its opportunity cost here (assuming excess capacity in the host carrier’s network), the access rate for an MVNO can be considerably less than that obtained by a roaming carrier that threatens to divert some of the host carrier’s customers.

13. There are two general cases in which a host carrier and an MVNO (as opposed to a roaming carrier) will voluntarily consummate an access agreement. First, some MVNOs are more efficient (relative to the host carrier) in retailing mobile service to the *same set* of customers targeted by the host carrier, leaving the MVNO a profit equal to the MVNO’s cost advantage;⁹ in this case, the host carrier will expect to be compensated for its forgone revenue stream. Second, some MVNOs are more efficient (relative to the host carrier) at selling mobile service to a *new set* of customers that are not likely to be served by the host carrier; in this case, there is no forgone revenue stream, leaving a greater opportunity for a split of incremental profits (equal to the newfound revenue stream) between the access seeker and the access provider.

14. There are other cases in which a host carrier and a *roaming carrier* (as opposed to an MVNO) will voluntarily consummate a roaming agreement. For example, a roaming carrier that does not market its services to customers inside the footprint of the host carrier, but instead requires access to the host’s network solely to provide its customers roaming outside of the roaming carrier’s footprint, does not threaten the host carrier’s revenue streams. This could apply to a rural carrier or a carrier operating in a remote area, who seeks to offer nationwide service. In these cases—when the host carrier’s revenue streams are not put at risk—the roaming rate will be based on some split of the incremental profit created for the roaming carrier, made possible by enlarging the roaming carrier’s network. Economics cannot place a precise value on how the roaming carrier’s incremental profit will be shared.¹⁰

15. In contrast, a roaming carrier that markets its services to customers inside the footprint of the host carrier imposes an opportunity cost on the host—namely, with an expanded footprint, the roaming carrier could induce existing (or potential) customers of the host carrier to switch to the roaming carrier, thereby threatening the host carrier’s

8. See DENNIS W. CARLTON & JEFFREY M. PERLOFF, *MODERN INDUSTRIAL ORGANIZATION* 303-05 (Addison Wesley 2005). Basic pricing theory shows a firm can increase profits by charging differently based on a buyer’s (or a group of buyers’) elasticity of demand. When arbitrage prevents such differential pricing, the firm chooses a second-best solution, in which the average elasticity is used to set prices uniformly.

9. In contrast, if the MVNO has the same costs as the host carrier, and if the access price is set equal to the forgone net retail revenues, then the MVNO earns zero profits at prevailing retail rates.

10. See, e.g., Kenneth Binmore, Ariel Rubinstein & Asher Wolinsky, *The Nash Bargaining Solution in Economic Modeling*, 17 (2) *RAND J. ECON.* 176-88 (1986); AVINASH DIXIT & SUSAN SKEATH, *GAMES OF STRATEGY* 524-47 (W.W. Norton, 1999).

REDACTED FOR PUBLIC INSPECTION

revenue streams; in this case, one would expect the roaming rate to be based on the host carrier's opportunity costs. Table 1 summarizes the discussion.

**TABLE 1: WHEN ACCESS PRICING IS BASED ON OPPORTUNITY COSTS
VERSUS SPLIT OF INCREMENTAL PROFIT**

Access Seeker	Markets to New/Non-Overlapping Customers	Markets to Existing/Overlapping Customers
MVNO	Split of Incremental Profit*	Opportunity Cost
Roaming Carrier	Split of Incremental Profit**	Opportunity Cost

Notes: * Based on newfound revenue streams for the MVNO. ** Based on incremental value of expanded network for the roaming carrier.

B. Special Cases Under Which a Market Comparable May Not Be Commercially Reasonable

16. In certain narrow circumstances, the market-determined access rate described above may be unavailable. In other limited cases, the market-determined rate may be inefficient even though the access seeker voluntarily submitted to the rate. In these special cases, reference points may inform the commercially reasonable rate. Although the Commission has determined that some of these exceptions, such as the need to set *ex ante* rates to constrain market power, do not apply in the competitive wireless market,¹¹ it is worth mentioning them briefly here for completeness.

1. Special Case: Absence of market comparables

17. In some roaming disputes, close market comparables may not be available, in which case an alternative approach to measuring fair market value is needed. For example, the roaming agreements for a 4G network might not inform the commercially reasonable rates for a new 5G network that permits never-before-offered retail plans for mobile video subscriptions. In other cases, the host carrier may have an agreement with an MVNO that markets prepaid plans (with the aim of addressing under-served customers), but the access seeker is a roaming carrier that markets its service to existing customers within the host's territory. (Other critical differences between MVNO agreements and roaming agreements are explained below.)

18. This special case is not applicable here, since market comparable agreements for negotiated roaming rates, including both roaming rates paid to and paid by Verizon, are available. Verizon has compiled a database of over 50 active CDMA roaming agreements with domestic roaming partners.¹² I understand that none of the observations in the database involves agreements with MVNOs, which makes the sample reasonably comparable to NTCH, Inc. ("NTCH"), which is also a roaming carrier. To an

11. *In the Matter of Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers*, 22 FCC Rcd. 15817 ¶ 39 (2007) ("Capping roaming rates by tying them to a benchmark based on larger carriers' retail rates may diminish larger carriers' incentives to lower retail prices" and "may also give smaller regional carriers an incentive to reduce, or even eliminate, the discounts they offer on regional calling plans.").

12. See Verizon's Statement of Facts, Verizon NTCH Response 8-4-2014 (1 of 3), at 12.

economist, the sample average is relevant because it serves as a simple prediction of the rates for any given roaming partner.¹³ [BEGIN HIGHLY CONFIDENTIAL]

[REDACTED] [END HIGHLY CONFIDENTIAL]

2. Special Case: Retail monopoly power

19. When the access provider has a monopoly in the retail market, then the retail price that reflects the relevant opportunity cost (and preserves the retail revenue streams) may reflect monopoly prices, which could perpetuate inefficient output levels.¹⁶ Despite the fact that some access seekers may voluntarily pay this rate—for example, even at the monopoly rates, some resellers will have lower retail costs than the network owners—the resulting roaming rate may not represent a commercially reasonable rate.

20. Again, this special case is also not applicable here. Retail prices for mobile broadband service are falling and reflect intense competition among the four national providers, as well other regional providers. According to the Bureau of Labor Statistics, the prices for “wireless telephone services” have declined by roughly 13.5 percent over the past decade.¹⁷ And the major carriers are currently engaged in intense price competition. Retail competition ensures that the voluntary roaming rates do not reflect monopoly rents.

3. Special Case: Vertical integration with a must-have input

21. Another circumstance potentially leading to inefficient access pricing based on market comparables may arise when (a) the specific input for which access is sought is “must-have”—that is, failure to obtain access in the specific circumstances at issue would impair the access seeker’s ability to compete effectively in the downstream market—and (b) the input is owned by a firm that competes against the access seeker in

13. This is why more sophisticated prediction models, such as regression forecasts, are judged on the ability to predict outcomes over and above what could be predicted with knowledge of the mean alone. *See, e.g.,* RAMU RAMANATHAN, *INTRODUCTORY ECONOMETRICS WITH APPLICATIONS* 164 (Dryden Press 1992) (describing a prediction model’s R-squared statistic).

14. Statement of Facts of Verizon Wireless, at 12 (included in Verizon NTCH response 8/4/2014 1 of 3.pdf).

15. *Id.*

16. Monopoly pricing creates what economists call a “deadweight loss” because the firm forgoes transactions with the consumers in which a potential gain to either the seller or buyer (or both) was not achieved. For a critique of the efficient component pricing rule when the access provide is a “local monopoly bottleneck,” see Nicholas Economides & Lawrence Wright, *Access and interconnection pricing: How efficiency is the “efficient component pricing rule?”* THE ANTITRUST BULLETIN 557-79 (Fall 1995).

17. BLS, Consumer Price Index—All Urban Consumers, Series id: CUUR0000SEED03 (Dec. 2005 = 64.6% of Dec. 1997 prices; Dec. 2014 = 55.9% of Dec. 1997 prices), available at <http://data.bls.gov/cgi-bin/dsrv>.

REDACTED FOR PUBLIC INSPECTION

an ancillary product market. A regional sports network owned by a cable operator is one example of this phenomenon.¹⁸

22. As was the case with monopoly retail power, this special case is also inapplicable here. The existence of several competing networks gives roaming carriers the ability to play one against the other. Access to Verizon's network, as opposed to any other carrier's network, is not "must have" because a roaming carrier with access to AT&T's, Sprint's or T-Mobile's network (or any regional carrier's network that covers the desired roaming area) would not be impaired in its ability to compete for retail wireless customers; that would only be the case if these other networks were perceived by customers to be so inferior to Verizon's network that substitution was impossible.¹⁹ If Verizon were in sole possession of a must-have input, then it should be running away with the wireless prize; yet T-Mobile captured an impressive 70 percent of the growth in new wireless subscribers in 2014, twice as much as AT&T and Verizon combined, and an even larger share in the first quarter of 2015.²⁰

23. NTCH makes much of Verizon's CDMA network,²¹ one of two types of "multiple access" technologies used by U.S. wireless carriers (GSM being the other). Despite its ubiquitous nature and high quality, Verizon's CDMA network is not a "must-have" input for roaming carriers because (a) other facilities-based carriers besides Verizon use CDMA, and (b) CDMA carriers including Verizon are migrating to 4G LTE networks, closing the gap between CDMA and GSM. By historical accident, Sprint, Verizon and U.S. Cellular²² use CDMA because their predecessors switched from analog to digital around 1995-96, and CDMA was the newest technology at that time. In

18. Consider the licensing fee (an access rate) that is struck between a regional sports network (RSN) and two local providers of cable television service to be the "standalone rate." Suppose that one of the two cable providers acquires the RSN. The vertically integrated cable operator has a fresh incentive to raise the access price above the standalone rate, as the integrated RSN can internalize a benefit that was not available to the independent RSN. See Kevin Caves, Chris Holt, & Hal Singer, *Vertical Integration in Multichannel Television Markets: A Study of Regional Sports Networks*, 12(1) REVIEW OF NETWORK ECONOMICS (2013), available at <http://www.degruyter.com/view/j/rne.2013.12.issue-1/rne-2012-0022/rne-2012-0022.xml>.

19. For example, customers reported 11 problems per 100 mobile device interactions for Verizon, compared to 13, 16, and 18 for AT&T, T-Mobile, and Sprint, respectively. See J.D. Power, *Wireless Network Problem Incidence Increases as Texting and Web Use Grows*, Mar. 5, 2015, available at <http://www.jdpower.com/press-releases/2015-us-wireless-network-quality-performance-study—volume-1>. See also *Fastest Mobile Networks 2015*, PC MAGAZINE, June 22, 2015 (showing that Verizon ranked 89/100 in the mobile speed index, compared to 80, 69, and 84 for AT&T, Sprint, and T-Mobile, respectively), available at <http://www.pcmag.com/article2/0,2817,2485838,00.asp>.

20. Roger Entner, *Incentive Auctions: What Matters Here and Now*, May 14, 2015, Exhibit 2.

21. NTCH Amended Complaint, July 2014, ¶ 12 ("Carriers like NTCH, which are also CDMA-based, must, of practical necessity, have roaming agreements with VZW. VZW's national footprint far exceeds that of any other CDMA carrier, which means that in many parts of the country there is no realistic alternative to VZW as a roaming partner for NTCH's customers").

22. U.S. Cellular's own-network coverage is mainly in the Pacific Northwest, Midwest, parts of the East and New England. It offers national coverage through roaming agreements. See, e.g., Phil Goldstein, *U.S. Cellular to Launch LTE Roaming in Next 60-90 Days*, FIERCE WIRELESS, July 31, 2015, available at <http://www.fiercewireless.com/story/us-cellular-keeps-postpaid-subscriber-growth-chugging-along-q2/2015-07-31> ("The partner is likely a Tier 1 carrier, so U.S. Cellular customers will get access to a more robust and nationwide LTE network.") .

REDACTED FOR PUBLIC INSPECTION

contrast, AT&T and T-Mobile use GSM.²³ By the time 4G technologies emerged, Verizon and Sprint chose not to install newer CDMA technology, but instead opted for 4G LTE to be more compatible with global standards. Thus, the CDMA-GSM split among U.S. carriers will close eventually as they move to 4G LTE.

C. Other Policy Considerations that Should Inform the Commercially Reasonable Standard

24. From a policy perspective, the commercially reasonable access rate should be sufficiently high to encourage continued network investment by both the access provider and the access seeker. The *Data Roaming Order* recognizes that a commercially reasonable rate must balance the incentives for new entrants and incumbent providers to invest in and deploy advanced networks across the country.²⁴ In its recent Declaratory Ruling, the Wireless Bureau explained that “the level of a requesting provider’s build-out is a factor in determining the commercial reasonableness of a host provider’s proffered terms, and we believe the Commission intended to review the matter under the case-by-case, totality of the circumstances approach.”²⁵

25. Wireless providers invested \$33 billion in capital expenditures in 2013, and more than \$260 billion in the last decade²⁶ in broadband networks under the *belief* that their revenue streams would provide a sufficient return on investment; dilute those revenue streams too aggressively and the incentives for these investments disappear. Verizon was the first U.S. carrier to invest in LTE technology.²⁷ According to its financials, Verizon Wireless spent \$9.4 billion in capital expenditures in 2013 and \$10.5 billion in 2014,²⁸ and much of these expenditures went toward LTE technology.²⁹ An artificially low roaming rate would permit an access seeker to sit back and cherry pick that investment rather than make investments in improving its own network to compete with Verizon. Yet an explicit goal of the *Data Roaming Order* was to provide incentives to “those providers to invest and deploy advanced data networks, and avoid potential disincentives for those providers to invest.”³⁰

26. Investment incentives are particularly important because wireless carriers are continually upgrading their networks. Current 4G technology is just the current

23. Sascha Segan, *CDMA v. GSM: What's the Difference?*, PC MAGAZINE, Feb. 6, 2015, available at <http://www.pcmag.com/article2/0,2817,2407896,00.asp>.

24. *Data Roaming Order* ¶ 13.

25. *Declaratory Ruling* ¶ 28.

26. CTIA, *Wireless Quick Facts*, available at <http://www.ctia.org/your-wireless-life/how-wireless-works/wireless-quick-facts>.

27. Roger Cheng, *Verizon to be the first to field-test crazy-fast 5G wireless*, CNET, Sept. 8, 2015 (“The New York-based company was one of the first carriers in the world to employ 4G technology back when it announced it would begin trials in 2008.”)

28. Verizon 2014 Annual Report, Management Discussion and Analysis, at 26, available at http://www.verizon.com/about/sites/default/files/2014_vz_annual_report.pdf.

29. *Id.* (“Capital expenditures increased at Wireless in 2013 compared to 2012 in order to substantially complete the build-out of our 4G LTE network.”).

30. *Data Roaming Order* ¶ 21.

flavor, but it followed 3G, and it will soon be followed by 5G.³¹ If wireless investment were complete, it might be possible to construct an economic model showing that a bright-line rule tethered to an access provider's incremental costs maximized short-term consumer welfare. But when an industry is as dynamic as wireless, investment is never complete, and attempts to appropriate "sunk" investment will surely backfire. Mandating access at cost-based rates makes sense only when the market has reached the end-state of technology development; by effectively locking in the last generation of technology, a policy of cost-based regulation for roaming would become a self-fulfilling prophesy, as it would significantly dampen the incentives of wireless providers to innovate. In sum, mandated low roaming rates would deter facilities-based build-out.

II. POTENTIAL UTILITY OF REFERENCE POINTS IN THE ABSENCE OF RELIABLE MARKET COMPARABLES

27. In this section, I review the potential utility of two proposed reference points in the Wireless Bureau's Declaratory Ruling: (a) retail pricing and (b) wholesale (MVNO) pricing. I explain both the pitfalls (when improperly administered) and the utility (when properly administered) of using such surrogates when reliable market comparables are not available.

A. Retail Pricing

28. In its Declaratory Ruling, the Wireless Bureau declined to embrace T-Mobile's proposed surrogate test, which would have established a presumption that any roaming rate in excess of the access provider's retail "rate" expressed on a per *GB* basis was not commercially reasonable.³² In contrast, the host carrier's retail revenue stream on a per customer basis may be a useful reference point in considering the commercial reasonableness of offered roaming rates in certain circumstances where market comparables are not available.

1. Pitfalls when improperly administered

29. The basic problem with the retail-pricing surrogate as proposed by T-Mobile is that a wireless carrier's revenue stream from a given retail customer is not meaningfully divisible by the customer's usage. Consider the following illustrative

31. Roger Cheng, *Verizon to be the first to field-test crazy-fast 5G wireless*, CNET, Sept. 8, 2015 ("Verizon's tests have shown a connection speed that is 30 to 50 times faster than our current 4G network, or higher speeds than what Google Fiber offers through a direct physical connection into the home, Gurnani said.").

32. Declaration of Joseph Farrell, D.Phil. In Support of Petition for Expedited Declaratory Ruling of T-Mobile USA, Inc., May 19, 2014, ¶ 57 ("In this section I discuss several benchmarks that the Commission should consider in drafting prospective guidance for the industry and also in evaluating whether a proposed wholesale data roaming rate is "high" in a sense relevant to determining whether it is commercially unreasonable."), available at <http://apps.fcc.gov/ecfs/document/view?id=7521151798>. *Id.* ¶ 60 ("In light of the reasons to fear anticompetitive pricing in these markets for cooperation among rivals, and in combination with other benchmarks, excessive price discrimination in the form of a much higher price charged to rivals than charged to customers should sharpen concerns.").

REDACTED FOR PUBLIC INSPECTION

example: Assume Verizon competes with NTCH (in addition to other national or regional wireless providers) for retail customers in Columbia, South Carolina.³³ Assume that NTCH has deployed its own network in Columbia, and assume further that certain Columbia-based mobile users periodically commute to Charleston, the largest metropolitan city to the east of Columbia. Finally, assume that each commuter consumes ten percent of the commuter's monthly data usage on the highway, and no such commuter (or a business employing the commuter) would ever subscribe to a wireless carrier that did not cover the 119 (rural) miles on Interstate 26 between Columbia and Charleston.

30. By providing highway coverage to NTCH via roaming, Verizon would create a new option for wireless customers in Columbia and Charleston that did not previously exist. It would now be possible for a commuter who previously would have opted for Verizon to opt instead for NTCH. The retail revenue stream that Verizon would put at risk through such a roaming agreement would not be just the incremental revenues associated with the commuter's data usage over Interstate 26. Instead, the entirety of Verizon's retail revenue stream for that customer would be put at risk.

31. Calculating the forgone revenue stream is straightforward. For retail post-paid wireless customers, Verizon enjoys an average revenue per account of \$159.86 per month,³⁴ which turns out to be \$55.70 per connection (equal to \$159.86 divided by 2.87 retail postpaid connections per account).³⁵ Of course, not all of those revenues fall to Verizon's bottom line, but the portion that does represents an opportunity cost. A retail surrogate expressed on a per GB basis does not account for this forgone revenue stream.

TABLE 2: VERIZON'S PLANS EXPRESSED ON A PRICE PER GB BASIS

GB Included	Price	Implied Price Per GB*
1	\$30.00	\$30.00
3	\$45.00	\$15.00
6	\$60.00	\$10.00
12	\$80.00	\$6.67
SIMPLE AVERAGE		\$15.42

Source: <http://www.verizonwireless.com/landingpages/cell-phone-plans/>

Note: Assumes naively that each plan is equally popular, each customer consumes exactly her allotted data, and does not account for the associated fees required to access data, which could increase expenditures.

33. NTCH, which operates under the name ClearTalk, is based in Hermosa Beach, California. Bloomberg, Company Overview of NTCH, Inc., available at <http://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapid=13539440> (viewed Oct. 1, 2015). NTCH offers web-based customer service options in six states: South Carolina, Arizona, Colorado, Texas, Tennessee, and California. See ClearTalk, available at <http://www.cleartalk.net> (viewed Oct. 1, 2015). NTCH has a retail presence in Columbia, South Carolina.

34. Verizon Communications, S.E.C. FORM 10-K, 2014 Annual Report, at 18, available at http://www.verizon.com/about/sites/default/files/2014_vz_annual_report.pdf.

35. *Id.*

REDACTED FOR PUBLIC INSPECTION

Recall that in the illustrative example, the commuter consumes ten percent of her monthly data usage on the highway. To arrive at a roaming rate, the retail surrogate seeks to allocate retail rates to the highway-related usage, based on an artificial retail price per GB. According to Table 2, which operationalizes the retail surrogate, Verizon earns on average \$15.42 per GB on its wireless broadband customers, assuming naively that each plan is equally popular, and that each customer consumes exactly her allotted data.³⁶ Suppose the average Verizon user consumes 3 GB per month of data. If Verizon asked for anything more than \$4.63 per subscriber per month (equal to 10% of data consumed while roaming x 3 GB average usage per month x \$15.42 “average price per GB”), Verizon’s offer would violate a standard rigidly pegged to Verizon’s retail rate plans. But the roaming rate that would make Verizon indifferent between serving the customer indirectly (via a roaming agreement) and directly (as a retailer) would be significantly higher than just the sliver of incremental revenue that NTCH is offering to pay.

2. Utility when properly administered

32. The foregoing example illustrates how retail pricing may be considered in an economically meaningful manner to help inform the commercial reasonableness of an offered roaming rate in the event that market comparables are not available. In the case of a roaming carrier that competes directly with a host carrier, one relevant retail surrogate could be the average revenue per connection. Because the host carrier does not keep 100 percent of those revenues, however, it is appropriate to discount them by the relevant margin. In the case of a roaming carrier that does not compete directly with a host carrier, there is no opportunity cost (assuming excess capacity on the network), in which case the host carrier’s retail pricing is uninformative.

B. Wholesale Pricing

33. In its Declaratory Ruling, the Wireless Bureau declined to embrace T-Mobile’s alternative surrogate test, which would have established a presumption that any roaming rate in excess of the access provider’s MVNO wholesale rate was commercially unreasonable.³⁷ In contrast, MVNO rates may provide some utility in considering the reasonableness of roaming rates only when they are calibrated to account for the differences between the different types of access seekers—and, once again, only in circumstances where reliable market comparables for roaming rates are not available.

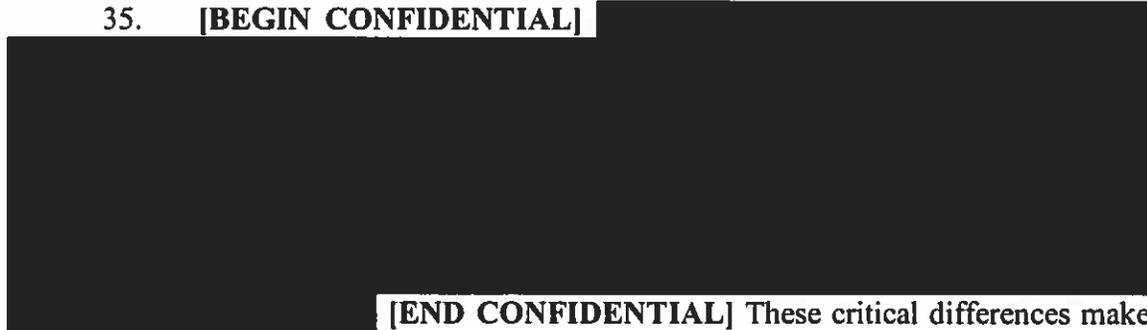
36. To arrive at its own retail surrogate, NTCH makes equally restrictive and unsupported assumptions on usage. *See* Initial Brief of NTCH, Inc. at 15-16, EB Dkt. No. 14-212 (filed Sept. 18, 2015) (stating “we have assumed usage of the maximum number of voice minutes possible in a quarter” and showing a total of 129,600 minutes of voice use (24 hours per day for 90 days) plus 12 GBs of data traffic on top of the non-stop voice use). NTCH offers no basis for its usage assumption (other than such an upgrade is available), and grounds its average price per GB to a single Verizon offering. *Id.* The arbitrary assumptions needed to employ the retail surrogate expose its limitations as a useful valuation metric.

37. Farrell Declaration ¶ 57.

1. Pitfalls when improperly administered

34. Wholesale rates provided to an MVNO are not appropriate surrogates for roaming rates offered to a roaming carrier that competes directly against the host carrier for at least two reasons. *First*, as explained above, MVNOs generally allow a wireless operator to reach a customer base that is not otherwise accessible under the wireless operator's current pricing regime. The host carrier does not need to be compensated for its typical forgone retail revenue streams when the reseller brings new customers to the equation. Accordingly, an access rate offered to an MVNO may be significantly less than that offered to a roaming carrier that competes directly with the host carrier.

35. **[BEGIN CONFIDENTIAL]**



[END CONFIDENTIAL] These critical differences make comparisons between MVNO and roaming rates particularly vexing, as the requisite *ceteris paribus* condition—all other things held equal—of market comparables is not satisfied.

36. Extending a more generous MVNO access rate to a roaming carrier could perversely encourage the roaming carrier to abandon its own network and become a pure reseller, which would be directly inconsistent with the objectives of the *Data Roaming Order* and section 706 of the Telecommunications Act.

2. Utility when properly administered

37. It goes without saying that an MVNO rate for an existing reseller that targets a new audience represents a potential market comparable for a similarly situated new reseller. Similarly, an MVNO rate for an existing reseller that targets the same customers as the host carrier (but does so more efficiently) represents a potential market comparable for a similarly situated new reseller. The problem occurs in the mapping from an MVNO rate to a roaming carrier rate.

38. In two cases, this mapping might be feasible when a direct market comparable (with a similarly situated roaming carrier) does not exist. These cases are represented as vertical movements along the same column in Table 1. For a roaming carrier that markets its service to non-overlapping customers, the access rate extended to an MVNO that markets service to new customers might serve as a reasonable reference point; both rely on a split of surplus. In addition, for a roaming carrier that markets its service to overlapping customers, the access rate extended to an MVNO that markets service to existing customers might serve as a reasonable reference point; both rely on the

host's opportunity costs. Of course, additional adjustments to the relevant MVNO rate might be needed to account for other differences in the rates, including volume discounts.

III. ASSESSMENT OF COMPETING OFFERS PURSUANT TO THE COMMERCIALY REASONABLE STANDARD

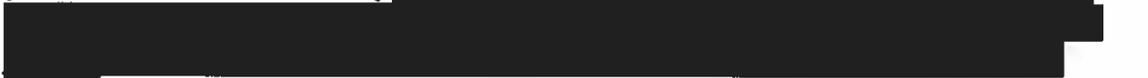
In this section, I review the offers from Verizon and NTCH to determine which is more closely grounded in market comparables. Table 3 summarizes the results.

[BEGIN CONFIDENTIAL]



[END CONFIDENTIAL]

[BEGIN CONFIDENTIAL]



[END CONFIDENTIAL] In contrast, NTCH's offer does not appear to be grounded in market comparables. **[BEGIN HIGHLY CONFIDENTIAL]**



[END HIGHLY CONFIDENTIAL]

CONCLUSION

39. In most circumstances relating to roaming arrangements between facilities-based wireless carriers, including the present one, market comparables can reliably inform fair market value and thus the commercially reasonable roaming rate. Because a large sample of market comparables is available, and because there is no basis to mistrust those market comparables, the potential utility of reference points is largely academic. Verizon's offer, which is more closely grounded in market comparables, is more consistent with an economic understanding of what constitutes a commercially reasonable roaming rate.

38 See Statement of Facts of Verizon Wireless, NTCH Answer as filed 8-14-2014 – HC, at 12.

REDACTED FOR PUBLIC INSPECTION

Verification Page

I hereby swear under penalty of perjury that the foregoing is true and correct.



Hal J. Singer

Dated: October 9, 2015

REDACTED FOR PUBLIC INSPECTION

APPENDIX 1: MATERIALS RELIED UPON

Regulatory Filings

In the Matter of Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers and Other Providers of Mobile Data Services, Second Report and Order, 26 FCC Rcd. 5411 ¶¶ 1, 13, 42, 68, 85-86 (2011); 47 CFR § 20.12(e)(1).

Wireless Bureau, Declaratory Ruling, *In the Matter of Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers and Other Providers of Mobile Data Services*, 29 FCC Rcd. 15483 ¶ 9 (2014).

In the Matter of Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers and Other Providers of Mobile Data Services, 25 FCC Rcd. 4181 ¶ 37 (2010) (“2010 Voice Roaming Order”); 47 CFR § 20.12(d).

In the Matter of Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers, 22 FCC Rcd. 15817 ¶ 39 (2007).

Articles and Books

Kevin Caves & Hal Singer, *On the Utility of Surrogates for Rule of Reason Cases*, CPI ANTITRUST CHRONICLE (May 2015).

William J. Baumol & Gregory Sidak, *The Pricing of Inputs Sold to Competitors*, 11 YALE J. REG. 171 (1994).

DENNIS W. CARLTON & JEFFREY M. PERLOFF, MODERN INDUSTRIAL ORGANIZATION (Addison Wesley 2004).

Kenneth Binmore, Ariel Rubinstein & Asher Wolinsky, *The Nash Bargaining Solution in Economic Modeling*, 17 (2) RAND J. ECON. 176-88 (1986).

AVINASH DIXIT & SUSAN SKEATH, GAMES OF STRATEGY 524-47 (W.W. Norton, 1999).

RAMU RAMANATHAN, INTRODUCTORY ECONOMETRICS WITH APPLICATIONS 164 (Dryden Press 1992).

Nicholas Economides & Lawrence Wright, *Access and interconnection pricing: How efficiency is the “efficient component pricing rule?”*, THE ANTITRUST BULLETIN 557-79 (Fall 1995).

Kevin Caves, Chris Holt, & Hal Singer, *Vertical Integration in Multichannel Television Markets: A Study of Regional Sports Networks*, 12(1) REVIEW OF NETWORK ECONOMICS (2013), available at <http://www.degruyter.com/view/j/rne.2013.12.issue-1/rne-2012-0022/rne-2012-0022.xml>.

Reports, Government Studies, and News Stories

Faten Sabry & William Hrycay, *An Economist’s View of Market Evidence in Valuation and Bankruptcy Litigation*, May 22, 2014, available at http://www.nera.com/content/dam/nera/publications/archive2/PUB_AnalysisMarketEvidence_0614.pdf.

BLS, Consumer Price Index—All Urban Consumers, Series id: CUUR0000SEED03 (Dec. 2005 = 64.6% of Dec. 1997 prices; Dec. 2014 = 55.9% of Dec. 1997 prices), available at <http://data.bls.gov/cgi-bin/dsrv>.

REDACTED FOR PUBLIC INSPECTION

J.D. Power, *Wireless Network Problem Incidence Increases as Texting and Web Use Grows*, Mar. 5, 2015, available at <http://www.jdpower.com/press-releases/2015-us-wireless-network-quality-performance-study—volume-1>.

Fastest Mobile Networks 2015, PC MAGAZINE, June 22, 2015, available at <http://www.pcmag.com/article2/0,2817,2485838,00.asp>.

Phil Goldstein, *U.S. Cellular to Launch LTE Roaming in Next 60-90 Days*, FIERCE WIRELESS, July 31, 2015, available at <http://www.fiercewireless.com/story/us-cellular-keeps-postpaid-subscriber-growth-chugging-along-q2/2015-07-31>.

Roger Entner, *Incentive Auctions: What Matters Here and Now*, May 14, 2015.

Sascha Segan, *CDMA v. GSM: What's the Difference?*, PC MAGAZINE, Feb. 6, 2015, available at <http://www.pcmag.com/article2/0,2817,2407896,00.asp>.

CTIA, *Wireless Quick Facts*, available at <http://www.ctia.org/your-wireless-life/how-wireless-works/wireless-quick-facts>.

Roger Cheng, *Verizon to be the first to field-test crazy-fast 5G wireless*, CNET, Sept. 8, 2015.

Verizon Communications, S.E.C. FORM 10-K, 2014 Annual Report, available at http://www.verizon.com/about/sites/default/files/2014_vz_annual_report.pdf.

Bloomberg Government, *Would Regulators Approve a Sprint-T-Mobile Merger*, Aug. 4, 2014, at 2, available at <http://about.bgov.com/bgov200/content/uploads/sites/2/2014/08/7TO6GA-HEak2zFTpAWXUIQ.pdf>.

Declaration of Joseph Farrell, D.Phil. In Support of Petition for Expedited Declaratory Ruling of T-Mobile USA, Inc., May 19, 2014

Case Materials

Verizon's Statement of Facts, Verizon NTCH Response 8-4-2014 (1 of 3).

NTCH Amended Complaint, July 2014.

REDACTED FOR PUBLIC INSPECTION

APPENDIX 2: CURRICULUM VITAE

Office Address

Economists Incorporated
2121 K Street, NW
Suite 1100
Washington, DC 20037
Phone: (202) 747-3520
singer.h@ei.com

Education

Ph.D., The John Hopkins University, 1999; M.A. 1996, Economics
B.S., Tulane University, *magna cum laude*, 1994, Economics. Dean's
Honor Scholar (full academic scholarship). Senior Scholar Prize in
Economics, 1994.

Current Position

ECONOMISTS INCORPORATED, Washington, D.C.: Principal 2014-
present.

Employment History

NAVIGANT ECONOMICS, Washington, D.C.: Managing
Director, 2010-2013.

GEORGETOWN UNIVERSITY, MCDONOUGH
SCHOOL OF BUSINESS, Washington, D.C.: Adjunct
Professor, 2010, 2014.

EMPIRIS, L.L.C., Washington, D.C.: Managing Partner
and President, 2008-2010.

CRITERION ECONOMICS, L.L.C., Washington, D.C.:
President, 2004-2008. Senior Vice President, 1999-2004.

LECG, INC., Washington, D.C.: Senior Economist, 1998-
99.

U.S. SECURITIES AND EXCHANGE COMMISSION,
OFFICE OF ECONOMIC ANALYSIS, Washington, D.C.:
Staff Economist, 1997-98.

REDACTED FOR PUBLIC INSPECTION

THE JOHNS HOPKINS UNIVERSITY, ECONOMICS
DEPARTMENT, Baltimore: Teaching Assistant, 1996-98.

Authored Books and Book Chapters

THE NEED FOR SPEED: A NEW FRAMEWORK FOR
TELECOMMUNICATIONS POLICY FOR THE 21ST
CENTURY, co-authored with Robert Litan (Brookings
Press 2013).

Net Neutrality Is Bad Broadband Regulation, co-authored
with Robert Litan, in THE ECONOMISTS' VOICE 2.0:
THE FINANCIAL CRISIS, HEALTH CARE REFORM
AND MORE (Aaron Edlin and Joseph Stiglitz, eds.,
Columbia University Press 2012).

Valuing Life Settlements as a Real Option, co-authored
with Joseph R. Mason, in LONGEVITY TRADING AND
LIFE
SETTLEMENTS (Vishaal Bhuyan ed., John Wiley & Sons
2009).

*An Antitrust Analysis of the World Trade Organization's
Decision in the U.S.-Mexico Arbitration on
Telecommunications Services*, co-authored with J. Gregory
Sidak, in HANDBOOK OF TRANS-ATLANTIC
ANTITRUST (Philip Marsden, ed. Edward Elgar
2006).

BROADBAND IN EUROPE: HOW BRUSSELS CAN
WIRE THE INFORMATION SOCIETY, co-authored with
Dan Maldoom, Richard Marsden and J. Gregory Sidak
(Kluwer/Springer Press 2005).

*Are Vertically Integrated DSL Providers Squeezing
Unaffiliated ISPs (and Should We Care)?*, co-authored with
Robert W. Crandall, in ACCESS PRICING: THEORY,
PRACTICE AND EMPIRICAL EVIDENCE (Justus
Haucap and Ralf Dewenter eds., Elsevier Press 2005).

Journal Articles

REDACTED FOR PUBLIC INSPECTION

On the Utility of Surrogates for Rule of Reason Cases,
COMPETITION POLICY INTERNATIONAL (2015), co-
authored with Kevin Caves.

*Analyzing High-Tech Employee: The Dos and Don'ts of
Proving (and Disproving) Classwide Antitrust Impact in
Wage Suppression Cases*," ANTITRUST SOURCE
(2015), co-authored with Kevin Caves.

Econometric Tests for Analyzing Common Impact, 26
RESEARCH IN LAW AND ECONOMICS (2014), co-
authored with Kevin Caves.

*Life After Comcast: The Economist's Obligation to
Decompose Damages Across Theories of Harm*,
ANTITRUST (Spring 2014), co-authored with Kevin
Caves.

Is the U.S. Government's Internet Policy Broken?, 5
POLICY AND INTERNET (2013), co-authored with
Robert Hahn.

*Avoiding Rent-Seeking in Secondary Market Spectrum
Transactions*, 65 FEDERAL COMMUNICATIONS LAW
JOURNAL (2013), co-authored with Jeffrey Eisenach.

*Vertical Integration in Multichannel Television Markets: A
Study of Regional Sports Networks*, 12(1) REVIEW OF
NETWORK
ECONOMICS (2013), co-authored with Kevin Caves and
Chris Holt.

*Assessing Bundled and Share-Based Loyalty Rebates:
Application to the Pharmaceutical Industry*, 8(4)
JOURNAL OF COMPETITION LAW AND
ECONOMICS (2012), co-authored with Kevin Caves.

*Lessons from Kahneman's Thinking Fast and Slow: Does
Behavioral Economics Have a Role in Antitrust Analysis?*,
The
ANTITRUST SOURCE (2012), co-authored with Andrew
Card.

*Assessing Competition in U.S. Wireless Markets: Review of
the FCC's Competition Reports*, 64 FEDERAL

REDACTED FOR PUBLIC INSPECTION

COMMUNICATIONS LAW JOURNAL (2012), co-authored with Gerald Faulhaber and Robert Hahn.

An Empirical Analysis of Aftermarket Transactions by Hospitals, 28 JOURNAL OF CONTEMPORARY HEALTH LAW AND POLICY (2011), co-authored with Robert Litan and Anna Birkenbach.

Economic Evidence of Common Impact for Class Certification in Antitrust Cases: A Two-Step Analysis, ANTITRUST (Summer 2011).

Addressing the Next Wave of Internet Regulation: Toward a Workable Principle for Nondiscrimination, 4 REGULATION & GOVERNANCE (2010), co-authored with Robert Hahn and Robert Litan.

Class Certification in Antitrust Cases: An Economic Framework, 17 GEORGE MASON LAW REVIEW (2010), co-authored with Robert Kulick.

The Economic Impact of Eliminating Preemption of State Consumer Protection Laws, 12 UNIVERSITY OF PENNSYLVANIA JOURNAL OF BUSINESS LAW 781 (2010), co-authored with Joseph R. Mason and Robert B. Kulick.

Net Neutrality Is Bad Broadband Regulation, THE ECONOMISTS' VOICE, Sept. 2010, co-authored with Robert Litan.

Why the iPhone Won't Last Forever and What the Government Should Do to Promote its Successor, 8 JOURNAL ON TELECOMMUNICATIONS AND HIGH TECHNOLOGY LAW 313 (2010), co-authored with Robert W. Hahn.

What Does an Economist Have to Say About the Calculation of Reasonable Royalties?, 14 INTELLECTUAL PROPERTY LAW BULLETIN 7 (2010), co-authored with Kyle Smith.

REDACTED FOR PUBLIC INSPECTION

Is Greater Price Transparency Needed in the Medical Device Industry?, HEALTH AFFAIRS (2008), co-authored with Robert W. Hahn and Keith Klovers.

Evaluating Market Power with Two-Sided Demand and Preemptive Offers to Dissipate Monopoly Rent, 4 JOURNAL OF COMPETITION LAW & ECONOMICS (2008), co-authored with J. Gregory Sidak.

Assessing Bias in Patent Infringement Cases: A Review of International Trade Commission Decisions, 21 HARVARD JOURNAL OF LAW AND TECHNOLOGY (2008), co-authored with Robert W. Hahn.

The Effect of Incumbent Bidding in Set-Aside Auctions: An Analysis of Prices in the Closed and Open Segments of FCC Auction 35, 32 TELECOMMUNICATIONS POLICY JOURNAL (2008), co-authored with Peter Cramton and Allan Ingraham.

A Real-Option Approach to Valuing Life Settlement Transactions, 23 JOURNAL OF FINANCIAL TRANSFORMATION (2008), co-authored with Joseph R. Mason.

The Economics of Wireless Net Neutrality, 3 JOURNAL OF COMPETITION LAW AND ECONOMICS 399 (2007), co-authored with Robert W. Hahn and Robert E. Litan.

Vertical Foreclosure in Video Programming Markets: Implication for Cable Operators, 3 REVIEW OF NETWORK ECONOMICS 348 (2007), co-authored with J. Gregory Sidak.

The Unintended Consequences of Net Neutrality, 5 JOURNAL ON TELECOMMUNICATIONS AND HIGH TECH LAW 533 (2007), co-authored with Robert E. Litan.

Does Video Delivered Over a Telephone Network Require a Cable Franchise?, 59 FEDERAL COMMUNICATIONS LAW JOURNAL 251 (2007), co-authored with Robert W. Crandall and J. Gregory Sidak.

REDACTED FOR PUBLIC INSPECTION

The Competitive Effects of a Cable Television Operator's Refusal to Carry DSL Advertising, 2 JOURNAL OF COMPETITION LAW AND ECONOMICS 301 (2006).

Überregulation without Economics: The World Trade Organization's Decision in the U.S.-Mexico Arbitration on Telecommunications Services, 57 FEDERAL COMMUNICATIONS LAW JOURNAL 1 (2004), co-authored with J. Gregory Sidak.

The Secondary Market for Life Insurance Policies: Uncovering Life Insurance's "Hidden" Value, 6 MARQUETTE ELDER'S ADVISOR 95 (2004), co-authored with Neil A. Doherty and Brian A. O'Dea.

Do Unbundling Policies Discourage CLEC Facilities-Based Investment?, 4 TOPICS IN ECONOMIC ANALYSIS AND POLICY (2004), co-authored with Robert W. Crandall and Allan T. Ingraham.

Foreign Investment Restrictions as Industrial Policy, 3 CANADIAN JOURNAL OF LAW AND TECHNOLOGY 19 (2004), co-authored with Robert W. Crandall.

Regulating the Secondary Market for Life Insurance Policies, 21 JOURNAL OF INSURANCE REGULATION 63 (2003), co-authored with Neil A. Doherty.

Interim Pricing of Local Loop Unbundling in Ireland: Epilogue, 4 JOURNAL OF NETWORK INDUSTRIES 119 (2003), co-authored with J. Gregory Sidak.

The Benefits of a Secondary Market for Life Insurance, 38 REAL PROPERTY, PROBATE AND TRUST JOURNAL 449 (2003), co-authored with Neil A. Doherty.

The Empirical Case Against Asymmetric Regulation of Broadband Internet Access, 17 BERKELEY TECHNOLOGY LAW JOURNAL 954 (2002), co-authored with Robert W. Crandall and J. Gregory Sidak.

How Can Regulators Set Nonarbitrary Interim Rates? The Case of Local Loop Unbundling in Ireland, 3 JOURNAL OF NETWORK

REDACTED FOR PUBLIC INSPECTION

INDUSTRIES 273 (2002), co-authored with J. Gregory Sidak.

Vertical Foreclosure in Broadband Access, 49 JOURNAL OF INDUSTRIAL ECONOMICS (2001) 299, co-authored with Daniel L. Rubinfeld.

Open Access to Broadband Networks: A Case Study of the AOL/Time Warner Merger, 16 BERKELEY TECHNOLOGY LAW JOURNAL 640 (2001), co-authored with Daniel L. Rubinfeld.

Cable Modems and DSL: Broadband Internet Access for Residential Customers, 91 AMERICAN ECONOMICS ASSOCIATION PAPERS AND PROCEEDINGS 302 (2001), co-authored with Jerry A. Hausman and J. Gregory Sidak.

Residential Demand for Broadband Telecommunications and Consumer Access to Unaffiliated Internet Content Providers, 18 YALE JOURNAL ON REGULATION 1 (2001), co-authored with Jerry A. Hausman and J. Gregory Sidak.

Determining the Source of Inter-License Synergies in Two-Way Paging Networks, 18 JOURNAL OF REGULATORY ECONOMICS 59 (2000).

A General Framework for Competitive Analysis in the Wireless Industry, 50 HASTINGS LAW REVIEW 1639 (2000), co-authored with J. Gregory Sidak and David Teece.

Capital Raising in Offshore Markets, 23 JOURNAL OF BUSINESS AND FINANCE 1181 (1999), co-authored with Ian Gray and Reena Aggarwal.

Expert Testimony Since 2010

Schuylkill Health System et al. v. Cardinal Health 200, LLC & Owens & Minor Distribution, Inc., Case No. 12-cv-07065-JS (E.D. Pa.).

Meda Pharmaceuticals Inc. v. Apotex, Inc and Apotex Corp., Case No. 01-14-0001-6315 (Am. Arbitration Ass'n).

REDACTED FOR PUBLIC INSPECTION

Mark S. Wallach, et al v. Eaton Corporation, et al, Case No. 10-260-SLR (D. Del.).

STB Ex Parte No. 722 Railroad Revenue Adequacy (Surface Transportation Board).

In the Matter of 2014 Quadrennial Regulatory Review – Review of the Commission’s Broadcast Ownership Rules and Other Rules Adopted Pursuant to Section 202 of the Telecommunications Act of 1996, MB Docket No. 14-50 (Federal Communications Commission).

Lindsay Kamakahi and Justine Levy, et al v. American Society for Reproductive Medicine and Society for Assisted Reproductive Technology, Case No.: 3:11-CV-1781 JCS (N.D. Ca.).

Salud Services, Inc. et al v. Caterpillar, Inc., Case No.: 1:12-cv-23927 (S.D. Fl.).

Gnanh Nora Krouch v. Wal-Mart Stores, Inc., Case No. CV-12-2217 (N.D. Ca.).

In the Matter of Petition for Rulemaking to Eliminate the Sports Blackout Rule, MB Docket No. 12-3 (Federal Communications Commission).

In the Matter of Review of Wholesale Services and Associated Policies, File No. 8663-C12-201313601 (Canadian Radio-Television and Telecommunications Commission).

Crafting a Successful Incentive Auction: Stakeholders’ Perspectives (U.S. Senate, Committee on Commerce, Science, and Transportation).

Altery Systems v. Enersys Delaware, Inc., Case No. 74-198-Y-001772-12 JMLE (American Arbitration Association).

In re New York City Bus Tour Antitrust Litigation, Master Case File No. 13-CV-0711 (S.D. NY).

SOCAN Tariff 22.A (Online Music Services, 2011-2013), CSI Online Music Services (2011-2013), SODRAC Tariff

REDACTED FOR PUBLIC INSPECTION

6 - Online Music Services, Music Videos (2010-2013)
(Copyright Board Canada).

Imperial Premium Finance, LLC, v. Sun Life Assurance
Company of Canada (S.D. Fl.).

Michelle Downs and Laurie Jarrett v. Insight
Communications Company, L.P., Civil Action No. 3:09-
Cv-93-S (W.D. Ky.).

The Satellite Television Law: Repeal, Reauthorize, or
Revise? (U.S. House of Representatives, Committee on
Energy and
Commerce).

Marchbanks Truck Service, et al. v. Comdata Network Inc.,
et al., Civil Action No. 07-1078-JKG (E.D. Pa.).

Patricia Reiter v. Mutual Credit Corporation, et al., Case
No. 8:09-cv-0081 AG (RNBx) (C.D. Ca.).

In re Photochromic Lens Antitrust Litigation, MDL Docket
No. 2173 (M.D. Fl.).

In the Matter of the Arbitration Between Washington
Nationals Baseball Club v. TCR Sports Broadcasting
Holdings, L.L.P. (Major League Baseball Revenue Sharing
Definitions Committee).

Miguel V. Pro and Davis Landscape et al. v. Hertz
Equipment Rental Corporation, No. 2:06-CV-3830 (DMC)
(D.N.J.).

Game Show Network, LLC v. Cablevision Systems
Corp., File No. CSR-8529-P (Federal Communications
Commission).

In Re Florida Cement and Concrete Antitrust Litigation,
Master Docket No. 09-23493-Civ-Altonaga/Brown
(S.D.Fl.).

Karen Ann Ishee Parsons et al. v. Bright House Networks,
Case No. CV-09-B-0267-S (N.D. Al.).

REDACTED FOR PUBLIC INSPECTION

In Re Cox Enterprises, Inc. Set-Top: Cable Television Box Antitrust Litigation, Case No. 5:09-ML-02048-C (W.D.Ok.).

Review of the Regulatory Framework Relating to Vertical Integration, Broadcasting Notice of Consultation CRTC 2010-783 (Canadian Radio-television Telecommunications Commission).

Apotex, Inc., v. Cephalon, Inc., Barr Laboratories, Inc., Mylan Laboratories, Inc., Teva Pharmaceutical Industries, Ltd., Teva Pharmaceuticals USA, Inc., Ranbaxy Laboratories, Ltd., and Ranbaxy Pharmaceuticals, Inc., Case No. 2:06-cv-02768-MSG (E.D. Pa.).

United States, et al. v Amgen, Inc., International Nephrology Network, et al., Civ. Action No. 06-10972-WGY (D. Mass.).

Carl Blessing et al. v. SIRIUS-XM Radio, Inc., Case No. 09-cv-10035 (HB) (S.D. N.Y.).

DISH Network L.L.C., v. Comcast Corporation, Comcast SportsNet California, Inc., Case No. 16 472 E 00211 10 (American Arbitration Association).

In Re Airline Baggage Fee Antitrust Litigation, Civil Action No. 1:09-Md-2089-Tcb (N.D. Ga.).

Applications of Comcast Corporation, General Electric Company and NBC Universal, Inc. for Consent to Assign Licenses or Transfer Control of Licensees, MB Docket No. 10-56 (Federal Communications Commission).

T-Mobile West Corporation v. Michael M. Crow, et al., Case No: 2:08-cv-1337 PHX-NVW (D. Az.).

Metlife Insurance Company of Connecticut and General American Life Insurance Company v. Thomas Petracek, Minnesota Estate Service, Inc., Michael J. Antonello, and Michael J. Antonenllo & Associates, Ltd., No. 08-CV-06095 DSD-FLN (D. Minn).

Tennis Channel, Inc. v. Comcast Cable Communications, LLC, File No. CSR-8258 (Federal Communications Commission).

REDACTED FOR PUBLIC INSPECTION

MEMdata, LLC, v. Intermountain Healthcare, Inc., and IHC Health Services, Inc., Civil No. 2:08-cv-190 (C.D. Utah).

Caroline Behrend, et al. v. Comcast Corporation, Civil Action No. 03-6604 (E.D. Pa.).

In the Matter of Distribution of the 2000-03 Copyright Royalty Funds, Dkt. No. 2008-2 CRB CD 2000-03 (Copyright Royalty Judges).

Cindy Johnson et al. v. Arizona Hospital and Health Care Association et al., Case No. 07-01292 (SRB) (D. Az.).

White Papers

Good Intentions Gone Wrong: The Yet-To-Be-Recognized Costs of the Department Of Labor's Proposed Fiduciary Rule (prepared for Capital Group), co-authored with Robert Litan (July 2015).

Bringing Sanity Back to the Spectrum Debate: A Response to CCA's White Paper (prepared for Mobile Future), co-authored with Allan Ingraham (June 26, 2015).

Unlocking Patents: Costs of Failure, Benefits of Success (prepared for Patent Utility) (Feb. 4, 2015).

The Consumer Benefits of Efficient Mobile Number Portability Administration (prepared for Neustar) (Mar. 8, 2013).

Economic Analysis of the Implications of Implementing EPA's Tier 3 Rules (prepared for Emissions Control Technology Association), co-authored with George Schink (June 14, 2012).

Are Google's Search Results Unfair or Deceptive Under Section 5 of the FTC Act? (prepared for Google), co-authored with Robert Litan (May 1, 2012).

Bundles in the Pharmaceutical Industry: A Case Study of Pediatric Vaccines (prepared for Novartis), co-authored with Kevin Caves (July 13, 2011).

REDACTED FOR PUBLIC INSPECTION

Are U.S. Wireless Markets Effectively Competitive? A Critique of the FCC's 14th and 15th Annual Wireless Competition Reports (prepared for AT&T), co-authored with Gerald R. Faulhaber, Robert W. Hahn (July 11, 2011).

Do Group Purchasing Organizations Achieve the Best Prices for Member Hospitals? An Empirical Analysis of Aftermarket Transactions (prepared for Medical Device Manufacturers Association), co-authored with Robert Litan (Oct. 6, 2010).

The Economic Impact of Broadband Investment (prepared for Broadband for America), co-authored with Robert Crandall (Feb. 23, 2010).

Why the iPhone Won't Last Forever and What the Government Should Do to Promote Its Successor (prepared for Mobile Future), co-authored with Robert Hahn (Sept. 21, 2009).

The Economic Impact of Eliminating Preemption of State Consumer Protection Laws (prepared for the American Bankers' Association), co-authored with Joseph R. Mason (Aug. 21, 2009).

Economic Effects of Tax Incentives for Broadband Infrastructure Deployment (prepared for the Fiber to the Home Council), co-authored with Jeffrey Eisenach and Jeffrey West (Dec. 23, 2008).

The Effect of Brokered Deposits and Asset Growth on the Likelihood of Failure (prepared for Morgan Stanley, Citigroup, and UBS), co-authored with Joseph Mason and Jeffrey West (Dec. 17, 2008).

Estimating the Benefits and Costs of M2Z's Proposal: Reply to Wilkie's *Spectrum Auctions Are Not a Panacea* (prepared for CTIA), co-authored with Robert W. Hahn, Allan T. Ingraham and J. Gregory Sidak (July 23, 2008).

Irrational Expectations: Can a Regulator Credibly Commit to Removing an Unbundling Obligation? AEI-Brookings Related Publication No. 07-28, co-authored with Jeffrey Eisenach (Dec. 30, 2007)

REDACTED FOR PUBLIC INSPECTION

Is Greater Price Transparency Needed in The Medical Device Industry? (prepared for Advanced Medical Technology Association), co-authored with Robert W. Hahn (Nov. 30, 2007).

Should the FCC Depart from More than a Decade of Market-Oriented Spectrum Policy? Reply to Skrzypacz and Wilson (prepared for CTIA), co-authored with Gerald Faulhaber and Robert W. Hahn (Jun. 18, 2007).

Improving Public Safety Communications: An Analysis of Alternative Approaches (prepared for the Consumer Electronics Association and the High Tech DTV Coalition), co-authored with Peter Cramton, Thomas S. Dombrowsky, Jr., Jeffrey A. Eisenach, and Allan Ingraham (Feb. 6, 2007).

The Budgetary Impact of Eliminating the GPOs' Safe Harbor Exemption from the Anti-Kickback Statute of the Social Security Act (prepared for the Medical Device Manufacturers Association) (Dec. 20, 2005).

Reply to "The Life Settlements Market: An Actuarial Perspective on Consumer Economic Value" (prepared for Coventry First), co-authored with Eric Stallard (Nov. 15, 2005).

The Competitive Effects of Telephone Entry into Video Markets (prepared for the Internet Innovation Alliance), co-authored with Robert W. Crandall and J. Gregory Sidak (Nov. 9, 2005).

How Do Consumers and the Auto Industry Respond to Changes in Exhaust Emission and Fuel Economy Standards? A Critique of Burke, Abeles, and Chen (prepared for General Motors Corp.), co-authored with Robert W. Crandall and Allan T. Ingraham (Sept. 21, 2004).

Inter-City Competition for Retail Trade in North Texas: Can a TIF Generate Incremental Tax Receipts for the City of Dallas? (prepared for Harvest Partners), co-authored with Thomas G. Thibodeau and Allan T. Ingraham (July 16, 2004).

An Accurate Scorecard of the Telecommunications Act of 1996: Rejoinder to the Phoenix Center Study No. 7

REDACTED FOR PUBLIC INSPECTION

(prepared for BellSouth), co-authored with Robert Crandall (Jan. 6, 2004).

Competition in Broadband Provision and Implications for Regulatory Policy (prepared for the Alcatel, British Telecom, Deutsche Telekom, Ericsson, France Telecom, Siemens, Telefónica de España, and Telecom Italia), co-authored with Dan Maldoom, Richard Marsden, and Gregory Sidak (Oct. 15, 2003).

The Effect of Ubiquitous Broadband Adoption on Investment, Jobs, and the U.S. Economy (prepared for Verizon), co-authored with Robert W. Crandall (Sept. 17, 2003).

The Deleterious Effect of Extending the Unbundling Regime on Telecommunications Investment (prepared for BellSouth), co-authored with Robert W. Crandall (July 10, 2003).

Letter Concerning Spectrum Auction 35 to the Honorable Michael K. Powell, Chairman, Federal Communications Commission, from Peter C. Cramton, Robert W. Crandall, Robert W. Hahn, Robert G. Harris, Jerry A. Hausman, Thomas W. Hazlett, Douglas G. Lichtman, Paul W. MacAvoy, Paul R. Milgrom, Richard Schmalensee, J. Gregory Sidak, Hal J. Singer, Vernon L. Smith, William Taylor, and David J. Teece (Aug. 16, 2002).

Speaking Engagements

DOL Rule Analysis and FSR's SIMPLE PTE Explained, FINANCIAL SERVICES ROUNDTABLE, Washington, D.C., Aug. 6, 2015.

New Principles for a Progressive Broadband Policy, PROGRESSIVE POLICY INSTITUTE, Washington, D.C., Mar. 13, 2014.

The Open Internet: Where Do We Go From Here? PROGRESSIVE POLICY INSTITUTE, Washington, D.C., Jan. 29, 2014.

Does Platform Competition Render Common Carriage Irrelevant in an IP world? PROGRESSIVE POLICY INSTITUTE, Washington, D.C. Nov. 20, 2013.

REDACTED FOR PUBLIC INSPECTION

The 41st Research Conference on Communication, Information and Internet Policy, TELECOMMUNICATIONS POLICY RESEARCH CONFERENCE, George Mason University School of Law, Arlington, VA, September 27, 2013.

The Broadband Technology Explosion: Rethinking Communications Policy for a Mobile Broadband World, Pepperdine School of Public Policy, Menlo Park, CA. June 20, 2013.

Net Neutrality: Government Overreach or the Key to Innovation?, NORTHWESTERN JOURNAL OF TECHNOLOGY AND INTELLECTUAL PROPERTY EIGHTH ANNUAL SYMPOSIUM, Chicago, IL., Mar. 8, 2013.

Internet Everywhere: Broadband as a Catalyst for the Digital Economy, The Brookings Institution, Washington, D.C., Nov. 27, 2012.

Can Broadband Power an Economic Recovery?, Advanced Communications Law & Policy Institute at New York Law School, Washington, D.C., July 10, 2012.

Using Regression in Antitrust Cases, UNIVERSITY OF PENNSYLVANIA LAW SCHOOL, Philadelphia, PA., April 12, 2012.

Mergers: The Road to Duopoly or Path to Competitive Panacea? NATIONAL ASSOCIATION OF REGULATORY UTILITY COMMISSIONERS, Los Angeles, CA., July 20, 2011.

State of the Mobile Net, CONGRESSIONAL INTERNET CAUCUS, Washington, D.C., May 27, 2011.

Waves of Innovation: Spectrum Allocation in the Age of the Mobile Internet, INFORMATION TECHNOLOGY & INNOVATION FOUNDATION, Washington D.C., May 17, 2011.

REDACTED FOR PUBLIC INSPECTION

With or Without Merit, Class Certification Requires Commonality, ABA SECTION OF ANTITRUST LAW 59TH ANNUAL SPRING MEETING, Washington, D.C., Mar. 30, 2011.

4th Annual Future of Private Antitrust Enforcement Conference, AMERICAN ANTITRUST INSTITUTE, Washington, D.C., Dec. 7, 2010.

Jobs and Technology, NEW DEMOCRATIC LEADERSHIP COUNCIL, Washington, D.C., Sept. 22, 2010.

Regulation and Broadband, ADVANCED COMMUNICATIONS LAW & POLICY INSTITUTE, NEW YORK LAW SCHOOL, New York, N.Y., July 14, 2010.

13th Annual Symposium on Antitrust, GEORGE MASON LAW REVIEW, Washington, D.C., Feb. 4, 2010.

Broadband Infrastructure and Net Neutrality, ADVISORY COMMITTEE TO THE CONGRESSIONAL INTERNET CAUCUS' STATE OF THE NET, Washington, D.C., Jan. 22, 2010.

The Consequences of Net Neutrality Regulations, AMERICAN CONSUMER INSTITUTE CENTER FOR CITIZEN RESEARCH, Washington, D.C., Nov. 19, 2009.

Wireless Innovation Luncheon, MOBILE FUTURE, Washington, D.C., Nov. 3, 2009.

Second Life Settlements & Longevity Summit, INSURANCE-LINKED SECURITIES & LIFE SETTLEMENTS, New York, N.Y., Sept. 30, 2009.

Perspectives on Investment and a National Broadband Plan, AMERICAN CONSUMER INSTITUTE, Washington, D.C., Sept. 4, 2009.

Markets and Regulation: How Do We Best Serve Customers?, Wireless U. Communications Policy Seminar, UNIVERSITY OF FLORIDA PUBLIC UTILITY RESEARCH CENTER, Tampa, FL., Nov. 13, 2008.

REDACTED FOR PUBLIC INSPECTION

The Price Of Medical Technology: Are We Getting What We Pay For? HEALTH AFFAIRS BRIEFING, Washington, D.C., Nov. 10, 2008.

Standard Setting and Patent Pools, LAW SEMINARS INTERNATIONAL, Arlington, VA., Oct. 3, 2008.

The Changing Structure of the Telecommunications Industry and the New Role of Regulation, INTERNATIONAL TELECOMMUNICATIONS SOCIETY BIENNIAL CONFERENCE, Montreal, Canada, June 26, 2008.

The Debate Over Network Management: An Economic Perspective, AMERICAN ENTERPRISE INSTITUTE CENTER FOR REGULATORY AND MARKET STUDIES, Washington, D.C., Apr. 2, 2008.

Merger Policy in High-Tech Industries, GEORGE MASON UNIVERSITY SCHOOL OF LAW, Washington, D.C., Feb. 1, 2008.

Telecommunications Symposium, U.S. DEPARTMENT OF JUSTICE ANTITRUST DIVISION, Washington, D.C., Nov. 29, 2007.

Wireless Practice Luncheon, FEDERAL COMMUNICATIONS BAR ASSOCIATION, Washington, D.C., Nov. 29, 2007.

Association for Computing Machinery's Net Neutrality Symposium, GEORGE WASHINGTON UNIVERSITY, Washington, D.C., Nov. 12, 2007.

Regulators' AdvanceComm Summit, NEW YORK LAW SCHOOL, New York, N.Y., Oct. 14, 2007.

Annual Conference, CAPACITY USA 2007, New York, N.Y., Jun. 26, 2007.

William Pitt Debating Union, UNIVERSITY OF PITTSBURGH, SCHOOL OF ARTS & SCIENCES, Pittsburgh, PA., Feb. 23, 2007.

REDACTED FOR PUBLIC INSPECTION

Annual Conference, WIRELESS COMMUNICATIONS ASSOCIATION INTERNATIONAL, Washington, D.C., June 27, 2006.

Annual Conference, MEDICAL DEVICE MANUFACTURERS ASSOCIATION, Washington, D.C., June 14, 2006.

Annual Conference, ASSOCIATION FOR ADVANCED LIFE UNDERWRITING, Washington, D.C., May 1, 2006.

Entrepreneur Lecture Series, LAFAYETTE COLLEGE, Easton, PA., Nov. 14, 2005.

Editorials and Magazine Articles

Obama's Big Ideas for Small Saves: 'Robo' Financial Advice, WALL STREET JOURNAL, July 21, 2015, co-authored with Robert Litan.

How the FCC Will Wreck the Internet, WALL STREET JOURNAL, May 28, 2015

The FCC's Incentive Auction: Getting Spectrum Right, PROGRESSIVE POLICY INSTITUTE PAPER, Nov. 2013.

Clash of the Titans: How the Largest Commercial Websites Got That Way, MILKEN INSTITUTE REVIEW, Second Quarter 2013, co-authored with Robert Hahn.

Wireless Competition: An Update, GEORGETOWN CENTER FOR BUSINESS AND PUBLIC POLICY ECONOMIC POLICY VIGNETTES, May 3, 2012, co-authored with Robert Hahn.

Book Review of Tim Wu's The Master Switch, MILKEN INSTITUTE REVIEW, January 2012.

The AT&T/T-Mobile Deal: Should We Fear Wireless Consolidation? FORBES, June 3, 2011.

REDACTED FOR PUBLIC INSPECTION

In FCC's Report on Wireless Competition, an Agenda?, HARVARD BUSINESS REVIEW, Apr. 15, 2011, co-authored with Gerald Faulhaber.

Will the Proposed Banking Settlement Have Unintended Consequences? HARVARD BUSINESS REVIEW, Mar. 29, 2010, co- authored with Joseph R. Mason.

Should Regulators Block AT&T's Acquisition of T-Mobile?, HARVARD BUSINESS REVIEW, Mar. 22, 2010.

The Black Hole in America's Retirement Savings, FORBES, Dec. 21, 2010, co-authored with Robert Litan.

Broken Compensation Structures and Health Care Costs, HARVARD BUSINESS REVIEW, Oct. 6, 2010, co-authored with Robert Litan.

Why Net Neutrality Is Bad for Business, HARVARD BUSINESS REVIEW, Aug. 13, 2010, co-authored with Robert Litan.

Why the iPhone Won't Last Forever and What the Government Should (or Shouldn't) Do to Promote Its Successor, MILKEN INSTITUTE REVIEW (First Quarter 2010), co-authored with Robert W. Hahn.

Streamlining Consumer Financial Protection, THE HILL, Oct. 13, 2009, co-authored with Joseph R. Mason.

Foxes in the Henhouse: FCC Regulation through Merger Review, MILKEN INSTITUTE REVIEW (First Quarter 2008), co- authored with J. Gregory Sidak.

Don't Drink the CAFE Kool-Aid, WALL STREET JOURNAL, Sept. 6, 2007, at A17, co-authored with Robert W. Crandall.

The Knee-Jerk Reaction: Misunderstanding the XM/Sirius Merger, WASHINGTON TIMES, Aug. 24, 2007, at A19, co- authored with J. Gregory Sidak.

Net Neutrality: A Radical Form of Non-Discrimination, REGULATION, Summer 2007.

REDACTED FOR PUBLIC INSPECTION

Telecom Time Warp, WALL STREET JOURNAL, July 11, 2007, at A15, co-authored with Robert W. Crandall.

Earmarked Airwaves, WASHINGTON POST, June 27, 2007, at A19, co-authored with Robert W. Hahn.

Not Neutrality, NATIONAL POST, Mar. 29, 2007, at FP19.

Should ATM Fees Be Regulated?, NATIONAL POST, Mar. 8, 2007, at FP17, co-authored with Robert W. Crandall.

Life Support for ISPs, REGULATION, Fall 2005, co-authored with Robert W. Crandall.

No Two-Tier Telecommunications, NATIONAL POST, Mar. 7, 2003, at FP15, co-authored with Robert W. Crandall.

Memberships

American Economics Association

American Bar Association Section of Antitrust Law

Reviewer

Journal of Risk and Insurance

Journal of Competition Law and Economics

Journal of Risk Management and Insurance Review

Journal of Regulatory Economics

Managerial and Decision Economics

Telecommunications Policy

