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December 16, 2011

Ms. Kirsten Walli
Board Secretary
Ontario Energy Board
2300 Yonge Street
PO Box 2319, 27th Floor
Toronto, ON
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Dear Ms. Walli:

RE: Application by Canadian Distributed Antenna Systems Coalition ("CANDAS");
Reply Evidence of Ms. Patricia D. Kravtin;
Board File No.: EB-2011-0120

We write on behalf of CANDAS and in accordance with in Procedural Order No. 6, to file a report prepared by Ms. Patricia D. Kravtin replying to the evidence of Toronto Hydro-Electric System Limited filed in this proceeding. Ms. Kravtin's report replaces the report of Dr. Roger Ware that CANDAS filed under cover of letter dated October 11, 2011. Dr. Ware's report, as well as his responses of interrogatories on his report, are hereby withdrawn.

CANDAS will file two paper copies of Ms. Kravtin's report as soon as possible.

Yours very truly,

(signed) H.T. Newland

HTN/ko
Encls.
cc: All Intervenors

REPLY REPORT

PATRICIA D. KRAVTIN

BEFORE THE
ONTARIO ENERGY BOARD

SUBMITTED ON BEHALF OF THE CANADIAN DISTRIBUTED ANTENNA SYSTEM COALIATION

December 16, 2011

REPLY REPORT OF

PATRICIA D. KRAVTIN

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I. INTRODUCTION AND QUALIFICATIONS

1. My name is Patricia D. Kravtin. My business address is 57 Phillips Avenue, Swampscott, Massachusetts. I am an economist in private practice specializing in the analysis of telecommunications and energy regulation and markets. I was asked by counsel for the Canadian Distributed Antenna System Coalition ("CANDAS") to review certain materials filed in the Ontario Energy Board's File No. EB-2011-0120 and to prepare a reply report setting forth my opinions on the economic and public policy issues raised in the evidence of Mr. Michael Starkey and Dr. Adonis Yatchew on behalf of Toronto Hydro-Electric Systems Limited ("THESL"), and in particular, the economic and public policy grounds for mandating access to utility poles by telecommunications carriers.

2. Over the course of my career, I have been actively involved in state and federal regulatory commission proceedings involving the economic regulation of incumbent telephone and electric utilities and access, by competitive telecommunications companies, to the facilities of such utilities, including poles, ducts, conduits, and rights-of-way. I have testified extensively on such matters before state and federal regulatory agencies including: the Federal Communications Commission ("FCC") (including in its most recent pole proceeding setting new rules for wireline and wireless attachments and the recently decided Gulf Power case addressing the evidentiary burden of showing that a pole is at full capacity); the Federal Energy Regulatory Commission ("FERC"); the Ontario Energy Board ("OEB")[1]; the Canadian Radio-television and Telecommunications Commission ("CRTC"); the Guam Public Utilities Commission; and numerous state regulatory commissions including those in Arkansas, Georgia, Kentucky, New Jersey, New York, Ohio, South Carolina, Texas, Virginia, and the District of Columbia. I have been qualified as an expert on matters pertaining to access to poles, ducts, conduits and rights-of-way before numerous state and federal district courts including those in Florida, New York, California, Washington, and North Carolina. A detailed resume of my

[1] *In re Canadian Cable Television Association*, OEB File No. RP-2003-0249 (the "CCTA proceeding") and Decision and Order dated March 7, 2005, (the "CCTA Order").

educational background and previous experience, including a full listing of proceedings I have testified in and reports I have authored, is provided in Attachment 1 to this report.

II. EXECUTIVE SUMMARY

3. My conclusions are summarized as follows:

- The intrinsic characteristics of utility poles that make it necessary, efficient, and practical for their shared occupancy by cable and wireline telecommunications hold just as true in the case of wireless telecommunications.

- Space on utility poles is not a scarce resource in any true economic sense; pole space is nonrivalrous in consumption and characterized by readily available capacity under normal utility operating practices.

- The utility pole owner, by virtue of its natural monopoly, is in a position to artificially limit and control access to its network of poles despite the relative ease with which the utility can accommodate additional attachments through the make-ready process – the cost of which is fully reimbursable to the utility by the incremental attacher.

- Arguments by Dr. Yatchew and Mr. Starkey in support of THESL's position to deny wireless the right of access to utility poles are based on flawed competitive analyses, including flawed definitions of the relevant markets, for both the underlying input and the downstream final product for which the input is a key element of production (and, thus, from which the demand for the input is derived).

- The competitive analyses of Dr. Yatchew and Mr. Starkey are at odds with the economic reality of a highly dynamic, convergent telecommunications market – a key market condition recognized and acknowledged as such by both Dr. Yatchew and the OEB in the 2005 CCTA proceeding and by Dr. Yatchew in evidence he presents in this proceeding.

- The shared occupancy of utility poles produces an economic "win-win" for the utility, its ratepayers, and third-party attachers alike, with significant spillover benefits to consumers and society at large.

- The public interest standard applicable to the regulation of a public utility appropriately takes into consideration the significant benefits to society associated with granting all carriers, regardless of their choice of wireline, wireless or hybrid facilities or technologies, the same right of access to utility poles.

- The public interest is not served by giving a monopoly pole-owning utility unfettered discretion to unfairly discriminate against a given carrier based on that carrier's choice of facilities or technologies or any other aspect of the carrier's business model.

- Valid safety or operational concerns regarding wireless attachments – as with attachments of any kind – can be (and generally are) addressed in existing objective standards and procedures and non-discriminatory terms and conditions of attachment. Such concerns are not proper grounds for denying the same fundamental right of access to utility poles by telecommunications carriers. Nor are they proper grounds for imposing arbitrary, unreasonable, or discriminatory conditions or requirements on any given telecommunications attacher or any particular type of attachment.

III. CHARACTERISTICS OF POLE NETWORKS SUPPORT SHARED USE OF UTILITY POLES

Pole Networks Are a Natural Monopoly

4. Unlike incumbent telephone and electric utilities but similar to cable companies and competitive telecommunications carriers, wireless telecommunications carriers (including facilities-based providers who use a combination of wireline and wireless technologies such as outdoor DAS) face many regulatory and economic barriers to the construction of dedicated pole networks. Wireless carriers, who are increasingly seeking to compete in

the market for high-quality, ubiquitous telecommunications services, have little, if any, realistic choice but to rent space on existing utility poles.

5. Utility pole networks are a classic case of what economists refer to as "natural monopolies." In any given area, typically, there is one dominant regulated utility provider of poles with surplus space. In other words, typically, there is no other regulated or unregulated pole owner that leases pole space in sufficient quantity and/or ubiquity so as to provide cable and telecommunications carriers with a viable alternative to pole space leased from the dominant utility. Moreover, local governmental authorities generally resist authorizing unnecessary duplication of outside plant and/or disruptive street cuts. Even if local permits were to be granted, the prohibitively expensive cost of constructing multiple stand-alone, duplicative pole networks throughout the entire service area and the social, aesthetic, and other costs of constructing duplicative outside plant, have long served to effectively require cable and telecommunications carriers to follow the existing paths of dominant utilities' networks. The same holds true for wireless carriers seeking to effectively compete with these firms.

Capacity on Utility Poles Is Not a Scarce Resource – Only the Monopoly Power of the Utility Over Its Pole Network Enables the Utility to Limit Access

6. Both Dr. Yatchew and Mr. Starkey assert limited available capacity on utility poles as grounds for denying wireless carriers access to utility poles for wireless equipment attachments – the former focuses on the space requirements for wireless equipment attachments relative to "traditional" attachments,[2] and the latter directly asserts that pole space is a limited resource based on assumptions regarding multiple future uses.[3] Neither argument is grounded in economic reality.

7. The economic reality is that poles, unlike other readily depletable resources, have a unique characteristic that makes them "for practical purposes, *nonrivalrous*."[4] Where a resource is "nonrivalrous," one entity's use of a resource does not diminish or preclude the use or benefits derived by another. Nonrivalrous use is the polar opposite of the

[2] See Starkey Affidavit at 12 -20.
[3] See Yatchew Affidavit at 16-17.
[4] See *Alabama Power v. FCC*, 311 F.3d 1357(11th Cir. 2002) ("*Alabama Power*" or "*APCo*") at 1369-70.

economic concept of zero sum, a term that describes a situation where if one party gains, the other party to the transaction must necessarily lose by the amount of the former's gain.

8. It is inefficient to prevent nonrivalrous use since the marginal (or incremental) cost of such use is at (or near) zero. This nonrivalrous condition is a defining feature of a public good and a basis for governmental intervention to ensure a more efficient outcome *i.e.*, one that promotes more sharing of the resource than would be produced by private market forces.

9. A nonrivalrous condition generally exists on poles due to an intrinsic economic characteristic of poles, where under normal operating conditions of production, capacity is *not* fixed in the short-run. Rather the capacity of a given pole and, necessarily, of any group of poles, is dynamic in nature. Based on utility data with which I am familiar, in the overwhelming majority of cases, additional attachments can be (and are) accommodated on utility poles with otherwise vacant space. Moreover, even on poles that appear "crowded," additional attachments can be (and are) accommodated in the normal course of utility operations, through pole modifications (*e.g.* reinforcement or change-outs) and rearrangements of existing attachments. Thus, in a true economic sense, pole capacity is neither static nor finite, such that the sharing of poles does not result in either physical or economic exhaustion of the shared resource.[5]

10. In other words, if adding another attachment does not preclude the pole owner's ability to accommodate another attachment or alternative use or require the utility to displace another user or use then, by economic definition, there is no lost opportunity to the utility. Under these conditions, a given pole or group of poles is not at full capacity – there is available or effective capacity, even if the poles appear "crowded."

[5] See *Florida Cable Telecommunications Association et al v. Gulf Power Company*, EB Docket No. 04-381, FCC 07D-01 (Rel. Jan. 31, 2007) ("*FCTA*"), at ¶ 25 ("When capacity is available through rearrangement or expansion of a pole's height, its capacity cannot be full since there is no exclusion of another and no missed, foreclosed, or lost opportunity.")

11. Generally speaking, it is the fixed nature of most inputs that limit capacity or scale of operations. While all inputs are ultimately variable in the long run, what makes poles unique is their inherent ability to provide for greater effective capacity in the "shortest" of short-runs through the process of make-ready work (which is undertaken by the utility only at the full and sole expense of the incremental attacher, *i.e.*, as a fully reimbursable expense to the utility).[6] The only situations where a state of full capacity can be demonstrated in a true economic sense are those very limited situations in which all poles are actually fully occupied after all practical modifications or rearrangements have been made and pole change-outs for higher capacity poles cannot practically occur due to terrain, obstructions, zoning, or other such externally-imposed restrictions.

12. The only structural economic condition that affects access to pole space is the condition of monopoly power. By virtue of its monopoly control over the pole network, the utility is in a position to restrict access to its existing network of poles. Such restriction is an artificial barrier to an available resource and does not reflect any structural economic condition of resource exhaustion or state of full capacity.

Concerns About Utility's Ability to Accommodate Wireless Are Unfounded

13. With the introduction of facilities-based competition into telecommunications markets over twenty years ago, the U.S. 1996 Telecommunications Act mandated a right to access utility poles to include telecommunications carriers in addition to cable operators. Utilities in the U.S. expressed similar concerns to those being expressed by THESL about insufficient capacity on poles to accommodate new third-party attachers in connection with the Act's expanded mandate. These concerns about a deluge of new third-party attachments have not been borne out. As a general proposition, over the past couple of decades, utilities have been able, through normal and customary make-ready practices, to accommodate all entities and all manner of attachments to their poles. Moreover, naturally occurring competitive market and technological forces that serve to

[6] Productive capacity on the utility's network of poles can be harnessed generally as fast as paperwork can be processed, and technicians called to rearrange attachments or install a taller pole from inventory. See FCC EB Docket 04-381, FCC 07D-01, at 1 ("make-ready is the means of providing space for attachments on poles already having the capacity to expand,…the case for practically all of Gulf Power's poles.")

limit the number of viable competitors in any given market and that promote more efficient means of production, and the normal rate of demand growth for the final product, tend to work in concert to place natural limits on both the number and space requirements of attaching entities.

IV. COMPETITIVE ANALYSES PRESENTED BY DR. YATCHEW AND MR. STARKEY ARE FLAWED

14. A competitive market analysis generally must begin with the proper definition of the relevant market. Conclusions reached as to the existence of market power (or lack thereof) are highly sensitive to the manner in which the relevant market is defined. From an economics perspective, the concept of substitutability lies at the heart of a competitive market analysis. Two products (or services) are considered to be in the same relevant market if they are close substitutes. On the demand side, this is measured by the extent to which buyers shift their consumption in response to a change in relative price, quality, or other competitive variable;[7] similarly, on the supply side, this is measured by the extent to which suppliers shift their production in response to relative changes in price, quality, or other competitive variables.[8] In the context of this widely-accepted analytical framework, Dr. Yatchew and Mr. Starkey incorrectly define the relevant market for both the underlying input and the downstream final product market for which the input is a key element of production and, thus, from which the demand for the input is derived. Their analyses do so by ignoring key structural conditions of supply and demand pertinent to the markets at issue in this proceeding and by failing to apply established economic principles and competition guidelines.

Input Market Definition Fails to Apply Established Competition Guidelines

15. Under well-established economic principles and competition guidelines such as those incorporated into U.S. and Canadian merger guidelines,[9] it is not sufficient to point to the

[7] See M. Scherer and David Ross, *Industrial Market Structure and Economic Performance*, Third Edition, Boston: Houghton Mifflin Company, 1990 (Scherer and Ross), at 75.
[8] *Id.*
[9] See U.S. Department of Justice and the Federal Trade Commission, Horizontal Merger Guidelines (Washington, April 2, 1992), http://www.usdoj.gov/atr/public/guidelines/horiz_book/hmg1.html; see also Canadian Competition Bureau Merger Enforcement Guidelines, http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/03384.html. Pursuant to these guidelines, a

mere existence of or numerousness of alternative siting options as Dr. Yatchew and Mr. Starkey suggest. To be economically meaningful, it must be demonstrated that these siting options are close substitutes in a real economic sense, *i.e.*, sufficiently close to limit the exercise of market power by the owner of the input as measured by the ability of the monopolist to profitably sustain a price increase. Dr. Yatchew does not appear to have applied these well established guidelines in his determination of the relevant input market. For the reasons discussed below, the various wireless siting alternatives identified by Dr. Yatchew and Mr. Starkey as constituting the relevant input market (*e.g.*, rooftops, towers, building walls, street furniture, assorted decorative fixtures, billboards, signage, and the like) [10] would not pass a valid price elevation test, *i.e.*, would not place any material constraint on the monopolist's (THESL's) ability to raise pole attachment prices for wireless *carrier*s seeking to effectively compete in the provision of telecommunications services.

16. On the demand side, as discussed in the CANDAS Application and in the evidence of Johanne Lemay and of Tormod Larsen,[11] the alternative wireless siting options identified by Dr. Yatchew and Mr. Starkey, do not offer anywhere near comparable coverage, regularity, height requirements, predictability, connectivity, bandwidth capacity, signal strength, network reliability, efficiency, and quality of service, among others, that access to THESL's pole network provides.[12] It is well established that such unique physical and

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properly framed analysis determines whether inclusion of potential substitutes would place any material constraint on the ability of a "hypothetical monopolist" to raise prices by a small but significant non-transitory amount and sustain profits. Only if the potential substitute would place such a constraint is the market definition properly expanded to include that alternative. Consideration is given to factors including the nature of the downstream competition faced by buyers in relevant output markets, and the timing and costs of switching to substitute inputs of production (*e.g.*, costs of delays, transaction costs, and inferior quality attributes).

[10] See Starkey Affidavit at 23, Yatchew Affidavit at 12,16.

[11] See Reports of Johanne Lemay and Tormod Larsen submitted on behalf of CANDAS, July 26, 2011 and Reply Evidence of Johanne Lemay submitted October 11, 2011. See, *e.g.*, Lemay Reply Evidence at 15-16 ("Outdoor DAS nodes have limited power and reach, typically less than 600 metres thus cannot be installed at the top of large towers to provide coverage for kilometers as macro cell sites do." Thus, macro cell sites are not interchangeable with utility poles…. and an outdoor DAS network cannot be deployed on, for example only rooftops or towers.")

[12] In adopting new rules applicable to both wireless and wireline carriers, the FCC acknowledged the importance of characteristics including "regularity," predictability," and "efficiency of deployment" especially as it pertains to wireless pole attachments" See FCC 11-50 at ¶¶41-42, see also n. 120 citing CTIA ("wireless providers operate in a fast-moving, intensely competitive industry, so speedy access to poles is just as important to wireless attachers as it is to wireline if not more so").

technical attributes ("actual or perceived") provide a valid basis upon which to "define distinct relevant markets."[13] Mr. Starkey and Dr. Yatchew place considerable emphasis on the existence of companies such as American Tower Corporation and Crown Castle International Corporation, "whose primary business is the siting of wireless and other communications facilities."[14] In addition to the fact that the cited companies do not appear to even have a presence in Canada, companies of this nature do not own networks that are comparable to the electricity utility pole network in any respect. Even in the jurisdictions in which these companies are operating, they are, for the most part, merely packaging together and reselling sites (largely owned by others) of the same types and having the same inferior qualities vis-à-vis utility poles, as the siting options individually identified by Mr. Starkey and Dr. Yatchew. Accordingly, they would fail a valid price elevation test.

17. Moreover, from a supply perspective, it is well established that utility pole networks are a natural monopoly. Accordingly, there are no practical and/or economically viable opportunities for other suppliers to enter the market and provide substitutes sufficiently close to utility poles so as to constrain a utility's ability, as monopoly owner (in the absence of regulation), to significantly raise prices for access to its pole network.

18. By framing their analyses of the input market in terms of the "siting market for *wireless* attachments," Mr. Starkey and Dr. Yatchew rely improperly on a definition based solely on the nature of a technology (*i.e.*, wireless[15]) used in the production of the output, without meaningful consideration of more relevant structural conditions affecting actual or perceived substitutability of demand or supply for the actual input in question, *i.e.*, pole attachments.[16] The result is the wrongful inclusion, in the relevant input market

[13] See Canadian Competition Bureau Merger Enforcement Guidelines at ¶4.14, http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/03384.html
[14] See THESL Notice of Motion at 10-13, Starkey Affidavit at 31-32,Yatchew Affidavit at 18-21.
[15] DAS providers actually use a combination of wireless and wireline components that "are equally essential to the operation of the network." See CANDAS Application at 12.
[16] Ironically, this is precisely what Mr. Starkey describes at page 24 of his Affidavit as inappropriate, but in the context of his discussion of essential facilities ("the extent to which a facility is 'essential' should not be considered based upon the business plan and/or experience of a single market participant using a particular type of technology.")

for pole attachments, of alternative siting options that may be used in the provision of an artificially limited subset of downstream *wireless* services, but that are decidedly inferior substitutes for access to the utility's existing pole network in the context of the relevant downstream market of convergent telecommunications services.

Final Product Market Definition Ignores Convergent Nature of Telecommunications

19. The relevant output or downstream final product market in which facilities-based service providers (including outdoor DAS to support the deployment of wireless services) are increasingly seeking to compete is not the amorphous *wireless* services market as Dr. Yatchew and Mr. Starkey suggest (which, according to Mr. Starkey, include such services as very short-range, fixed-location WiFi and limited user, private building femtocell applications[17]). Rather, it is the market for today's highly dynamic and convergent telecommunications services, including high quality, ubiquitous services, in which providers (including affiliates of pole-owning utilities) using wireline, wireless and hybrid technologies (such as outdoor DAS) increasingly compete in the provision of advanced broadband services. The convergent nature of the telecommunications market renders distinctions among and between industries and technological platforms, and in particular, distinctions between wireline and wireless technology, artificial and fleeting, and strongly supports adoption of policies of competitive and technological neutrality.[18]

20. These concepts were recognized by Dr. Yatchew in the report he submitted in the CCTA proceeding[19] and by the OEB in its decision in that case.[20] Dr. Yatchew identifies convergence as a "key trend" in his Affidavit in this case as well,[21] but then proceeds, largely, to ignore its logical consideration in the competitive market analysis he performs. Dr. Yatchew's CCTA report, as cited above, along with the OEB's recognition of industry convergence and the likely increasing number of attaching entities in the future,

[17] See Starkey Affidavit at 33-40.
[18] See FCC 11-50 at ¶42, n. 120 citing MetroPCS at 11 ("[applying the timeline to both wired and wireless attachments] is appropriate to ensure a level playing field between wired and wireless providers.")
[19] See Bridger Mitchell and Adonis Yatchew, *Joint Use Agreements for Power Poles: An Efficient and Equitable Standard, Report Prepared for the Electricity Distributors Association and the Canadian Electricity Association* (August 13, 2004) at 3.
[20] See CCTA Order at 4, 7.
[21] See Yatchew Affidavit at 8.

not only refute the market definitions relied on by Dr. Yatchew and Mr. Starkey in this case, they also refute the claim "that neither the Board, nor the intervenors, contemplated that the 'attachments' at issue would include the type of wireless attachments proposed by CANDAS."[22]

V. GRANTING ALL CARRIERS THE SAME NON-DISCRIMINATORY RIGHT TO ACCESS UTILITY POLES SERVES THE PUBLIC INTEREST

Shared Occupancy of Utility Poles Produces an Economic "Win-Win"

21. Policymakers in both Canada and the U.S. (in the earlier legislative history in connection with the 1978 Pole Attachments Act and reiterated in connection with the 1996 Telecommunications Act), have found sharing arrangements for pole users to be efficient, practical, and necessary for the public good.[23] Third-party attachments are occupying otherwise available but unused capacity on existing poles[24] and, as explained above, to the extent a utility pole becomes crowded, the capacity to accommodate an additional attachment can be readily accessed using normal, customary make-ready practices (at the third-party attacher's expense). For use of this otherwise available space and load-bearing capacity on utility poles, third party attachers are paying well in excess of the incremental costs associated with their occupancy, including a fair return on the utility's investment. Moreover, *in addition to* charging the regulated attachment rate, the utility is able to pass on, to attachers, make-ready charges that recover one-time incremental costs of accommodating pole attachments, including the full costs (as actually incurred and paid by the utility) associated with rearrangements and pole modifications or replacements. In addition to these charges, the utility may also charge an attacher other direct reimbursement fees, including fees for such administrative items as application processing, inspections and audits, unauthorized attachments, and additional trips to jobs. Finally, the utility may pass through the costs of removing attachments that are unauthorized or abandoned by the attachers and restoring the pole.

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[22] See Starkey at 20.

[23] See CCTA Order at 3; see also 47 U.S.C. § 224(f) (Supp. II 1996) and S. REP. NO. 95-580, at 16 (1977) ("Sharing arrangements minimize unnecessary and costly duplication of plant for all pole users, utilities as well as cable companies.").

[24] "CATV offers an income-producing use of an otherwise unproductive and often surplus portion of plant." Id. at 13.

22. Because of this additional compensation (which can be quite substantial) over and above the regulated rate and because pole upgrades that are paid for by the attacher through the make-ready process become the property of the utility, the pole owner (and its ratepayers) stand to be made *much better off* financially after the accommodation of an additional attachment. This can occur in any of the following ways:

- The utility receives revenue from the combination of make-ready and other direct fees plus the rental rate, which is in excess of the associated incremental costs it incurs, thus providing it (and ratepayers) with a contribution to the cost of providing core electric distribution service that it otherwise would not have, but for use of available pole capacity;

- When poles are modified or replaced (at the attaching entity's expense), the utility typically ends up with greater available pole capacity as compared with pre-attachment, because the modified or replacement poles are stronger or in better condition;

- The utility has the benefit of a stronger and often a newer pole for its own operations at the expense of the attacher and can realize savings (or deferred capital expenditures) to its own build-out program;

- With more potential space available on the pole to accommodate additional uses and/or users, the utility can realize additional sources of revenue; and

- Existing pole networks, including poles that may not ultimately be used for attachments, are subjected to additional inspections and engineering analyses at the expense of the attachers; this may serve to alert the pole-owner to safety or operational issues, including non-compliance with applicable standards.

23. Utility ratepayers also stand to benefit directly from the shared use of utility poles. The contribution received by the utility for use of otherwise available capacity, or to its

capital program through the process of make-ready at the attacher's expense, should translate into a reduced revenue requirement that has to be recovered through regulated rates. The sharing of the utility's pole network – an asset that has historically been paid for and maintained primarily using ratepayer dollars – allows for more effective utilization of the asset, and hence a means of effectively enhancing the return on ratepayer dollars.

24. Beyond the financial benefits to the parties directly involved with shared pole arrangement (*i.e.*, the private good aspect of the transaction), are the significant benefits that accrue to society at large. From a "social welfare" perspective, there is economic value to society associated with the efficient use of resources, *i.e.*, the use of resources resulting in the lowest overall cost to society and the best possible utilization of those resources vis-à-vis alternative uses. As mentioned earlier, utility distribution networks (including the pole component) are "natural monopolies," meaning "economies of scale are so persistent that a single firm can serve the market at a lower unit cost than two or more firms."[25] As a consequence, the shared use of a utility's existing distribution network results in a lower overall cost to the economy as a whole in terms of the consumption of societal resources. Resources that would otherwise be used (unnecessarily and more expensively) to duplicate existing pole networks are, instead, freed up and can be put to more productive uses – in particular, ones that can provide concrete benefits to consumers – *including the utility's own electric ratepayers* – such as the provision of new and improved services, at lower prices, to consumers in the downstream product markets in which access to utility poles are a key input of production. In the case of utility pole attachments, these benefits are particularly significant given the growing importance of the widespread availability of advanced broadband services (including mobile services) to the economic, health, education, safety and wellbeing of the public. Again, the public welfare includes the utility's own electricity ratepayers as well as the business, educational, medical, cultural, and governmental entities upon which they depend.

[25] F.M.Scherer, *Industrial Market Structure and Economic Performance*, Rand McNally, Chicago, 1980, at 482.

25. The more the monopoly owner of poles is allowed to exercise monopoly power over the pole network asset – either by outright denial of access to its network of poles or by charging a price for attachment that is too high, relative to economic costs – the greater the "deadweight" efficiency loss to society. The possibility of deadweight losses to consumers and society is all the more troubling given the relative ease with which cable and other third-party attachers have historically been accommodated through a utility's normal and customary make-ready arrangements. The physical configuration of a typical shared utility pole is one in which power, incumbent telephone and cable companies, competitive telecommunications carriers, and governmental attachers have installed facilities of all manner of shape, size and weight. Attachments present on utility poles, in addition to power, telephone and cable wires, include the following: power supplies; signal amplifiers; equipment enclosures; streetlights; private floodlights; traffic signals; fire and police call boxes and alarm signal wires; municipal communications systems; and antennas.

Public Interest Standard Considers Both Public and Private Benefits of Right to Access

26. Where government regulation of industry occurs, as in the case of public utilities, the overarching decision-making criteria to be applied by the regulator is a public interest standard. Applied to the instant proceeding, the public interest standard dictates that the appropriate economic and public policy calculus consider the costs and benefits associated with granting the same right to access to utility poles for wireless attachments as is provided for cable and wireline attachments, not only in terms of the interests of the pole owning utility or the third-party seeking access, but also from the perspective of the greater public good, including the interests of the ratepayers. Economists refer to this in the context of maximizing social welfare, and such analysis would include, but not be limited to, consideration of the respective private benefits to the parties directly involved.

27. The benefits of granting the same right of access to utility poles for wireless attachments at regulated rates, terms and conditions as is enjoyed by competing cable and wireline telecommunications attachments (and similarly the competitive disadvantages of

a denial of such access) are clear. However, as described above, there are also significant benefits to the utility, its ratepayers and society overall of having third-party entities share space on utility poles. This economic reality strongly supports a regulatory policy that mandates the same, non-discriminatory right to access utility poles to telecommunications attachments and/or attachers, without regard to the technology or mix of technologies employed or any other particular aspect of the carrier's business model. Given the characteristics of poles, there are essentially no costs to society of such a policy and any costs incurred by the utility are more than fully recoverable from the third-party attacher.

Utility's Unfettered Discretion Opens Door for Monopoly Abuse and Anti-Competitive Behavior

28. The need for effective pole regulation arose in the first instance because pole-owning utilities – who by sole virtue of their historical incumbency, including historical preferential access to the public rights of ways in which the poles are installed, own and control the ubiquitous network of poles to which cable and telecommunications carriers have no practical alternative but to attach – have historically used their leverage over the existing pole network as the basis for monopoly abuse. In the new, highly dynamic and convergent telecommunications industry, traditional cable and incumbent telephone companies are vertically integrated providers of an expanding range of telecommunications services including voice telephony, broadband, Internet access and mobile wireless services. New entrant telecommunications carriers are directly competing against incumbent telephone companies and cable operators but, increasingly, also with electric distribution utilities, their affiliates and/or companies in which the utility has an interest, whether by ownership or through contractual arrangements.

29. As is the case with wireline attachments, the mere existence of alternatives to attaching to utility poles (*e.g.*, the possibility of going underground) does not alter the fundamental structural conditions of supply and demand. As discussed above, the various siting options for wireless cited by Mr. Starkey and Dr. Yatchew are inherently limited in terms of availability, coverage, connectivity, capacity, and/or other needed

functionality and, as such, are demonstratively inferior substitutes for access to the utility's existing ubiquitous network of poles. Moreover, to the extent it is even possible to use those identified options at a scale and scope remotely close to that afforded by access to the utility's pole network, it would likely be prohibitively expensive and impractical, creating a substantial barrier to entry for a firm. [26]

30. In its historical context, and in light of the very significant benefits accruing to the public from third-party telecommunications attachment to utility poles, it does not serve the public interest to have THESL or any other electricity distributor, as monopoly owners of existing distribution pole networks, directly or indirectly impose restrictions, in their sole discretion, on the supply of telecommunications services that is available to the public. Nor does it serve the public interest to have utilities exert influence on the technology or mix of technologies and on the identities and business models of carriers seeking to enter and to compete effectively and sustainably in the telecommunications market. Yet, this will be precisely the outcome if electricity distributors are allowed to exercise unfettered discretion in deciding which telecommunications attachments or carriers get access to their poles and which do not.

31. Any decision by THESL or others to deny access to the wireless attachments of outdoor DAS providers would be particularly inefficient and arbitrary given the expressed acknowledgement, by THESL in this proceeding, that the CCTA Order mandates access for the attachment of the *wired* components of DAS. Given the

[26] Neither economic nor regulatory policy defines barriers to entry as an absolute condition, *i.e.*, one in which the constructed barrier prevents the firm (or firms) in question from providing any service in the given market. The economic literature defines barriers to entry in terms of the "condition of entry" or "state of potential competition' from possible new sellers, and as emanating from sources including absolute cost advantages, product differentiation advantages, and advantages of scale enjoyed by the established firm vis-à-vis the new seller. See Joe S. Bain, *Barriers to New Competition,* Cambridge, Ma.: Harvard University Press,1965 (Bain), p.3. The regulatory literature, most recently in response to the 1996 U.S. Telecom Act's mandate for competitive (and technological) neutrality, defines an entry barrier as any regulation or policy that "materially inhibits or limits the ability of any competitor or potential competitor to compete in a fair and balanced legal and regulatory environment. See FCC First Report and Order, *In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, CC Docket 96-98, FCC 96-325 ("FCC Local Competition Order,"), released August 8, 1996, at ¶308-310, also FCC Memorandum Opinion and Order, FCC 97-25, re: California Payphone Association Petition for Preemption of Ordinance No. 576 NS of the City of Huntington Park, California Pursuant to Section 253(d) of the Communications Act of 1934, CCB Pol 96-26, released July 17, 1997, at ¶¶31, 42.

underlying natural monopoly cost characteristics of utility poles, the ease with which space can be made available, and the public interest benefits (including to ratepayers) associated with shared access, giving carriers no alternative but to use markedly inferior and more costly alternatives to utility poles for wireless equipment attachments makes no sense from an economic or public policy perspective and serves only the very narrowly defined, anti-competitive, or pecuniary interest of THESL and the other distributors to the detriment of the greater public good.

Valid Safety or Operational Concerns Addressed in Existing Standards For Access

32. Ms. Byrne, in her evidence in this proceeding, cites alleged safety, operational and engineering concerns as grounds for THESL's denial of pole access for wireless attachments.[27] Such concerns are not unique to wireless equipment or to third party attachments generally. For example, data on alleged "safety violations" associated with pole attachments with which I am familiar, have shown violations associated with attachments of the utility's own distribution equipment at the same rate, if not higher, than those associated with third-party attachments. Unlike the utility, third party attachers typically face the threat of removal from utility poles if they do not correct an identified violation within the timeframe specified in the applicable terms and conditions of access. To the extent they exist, valid concerns related to safety, operational or engineering issues associated with wireless equipment are appropriately addressed in the same manner as they have been addressed in the case of wireline and other attachments, *i.e.*, through adherence to existing electrical safety codes and other objective standards of access established over the many years of experience with attachments to utility poles in general, and with shared occupancy, in particular. Indeed, such adherence is typically required under standard pole attachment terms and conditions. Accordingly, such concerns are not proper grounds for denying the same non-discriminatory right of access to utility poles for all telecommunications carriers, without regard to whether the attachments involve wireline or wireless facilities.

[27] See Byrne Affidavit at ¶¶40 – 46.

Attachment 1

Patricia D. Kravtin

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Summary

Consulting economist with specialization in telecommunications, cable, and energy markets. Extensive knowledge of complex economic, policy and technical issues facing incumbents, new entrants, regulators, investors, and consumers in rapidly changing telecommunications, cable, and energy markets.

Experience

CONSULTING ECONOMIST

2000–Present Independent Consulting Swampscott, MA

Providing expert witness services and full range of economic, policy, and technical advisory services in the telecommunications, cable, and energy fields.

SENIOR VICE PRESIDENT/SENIOR ECONOMIST

1982–2000 Economics and Technology, Inc. Boston, MA

Active participant in regulatory proceedings in over thirty state jurisdictions, before the Federal Communications Commission, Federal Energy Regulatory Commission, and other international regulatory authorities on telecommunications, cable, and energy matters.

Provided expert witness and technical advisory services in connection with litigation and arbitration proceedings before state and federal regulatory agencies, and before U.S. district court, on behalf of diverse set of pubic and private sector clients (see Record of Prior Testimony).

Extensive cable television regulation expertise in connection with implementation of the Cable Act of 1992 and the Telecommunications Act of 1996 by the Federal Communications Commission and local franchising authorities.

Led analysis of wide range of issues related to: rates and rate policies; cost methodologies and allocations; productivity; cost benchmarking; business case studies for entry into cable, telephony, and broadband markets; development of competition; electric industry restructuring; incentive or performance based regulation; universal service; access charges; deployment of advanced services and broadband technologies; and access to pole attachments and other rights-of-way.

Served as advisor to state regulatory agencies, assisting in negotiations with utilities, non-partial review of record evidence, deliberations and drafting of final decisions.

Author of industry reports and papers on topics including market structure and competition, alternative forms of regulation, patterns of investment, telecommunications modernization, and broadband deployment.

Invited speaker before various national organizations, state legislative committees and participant in industry symposiums.

Grant Reviewer for Broadband Technology Opportunities Program (BTOP) administered by National Telecommunications and Information Administration (NTIA), Fall 2009.

RESEARCH/POLICY ANALYST

1978–1980 Various Federal Agencies Washington, DC

Prepared economic impact analyses related to allocation of frequen spectrum (Federal Communications Commission).

Performed financial and statistical analysis of the effect of securit regulations on the acquisition of high-technology firms (Securities a Exchange Commission).

Prepared analyses and recommendations on national economic policy issu including capital recovery. (U.S. Dept. of Commerce).

Education

1980–1982 Massachusetts Institute of Technology Boston, MA

Graduate Study in the Ph.D. program in Economics (Abd). Gene Examinations passed in fields of Government Regulation of Indust Industrial Organization, and Urban and Regional Economics.

National Science Foundation Fellow.

1976–1980 George Washington University Washington, DC

B.A. with Distinction in Economics.

Phi Beta Kappa, Omicron Delta Epsilon in recognition of high scholas achievement in field of Economics. Recipient of four-year hon scholarship.

Prof. Affiliation

American Economic Association

Reports and Studies (authored and co-authored)

Report on the Financial Viability of the Proposed Greenfield Overbuild in the City of Lincoln, California, prepared for Starstream Communications, August 12, 2003.

"Assessing SBC/Pacific's Progress in Eliminating Barriers to Entry, The Local Market in California is Not Yet 'Fully and Irreversibly Open," prepared for the California Association of Competitive Telecommunications Companies (CALTEL), August 2000.

"Final Report on the Qualifications of Wide Open West-Texas, LLC For a Cable Television Franchise in the City of Dallas," prepared for the City of Dallas, July 31, 2000.

"Final Report on the Qualifications of Western Integrated Networks of Texas Operating L.P. For a Cable Television Franchise in the City of Dallas," prepared for the City of Dallas, July 31, 2000.

"Price Cap Plan for USWC: Establishing Appropriate Price and Service Quality Incentives in Utah" prepared for The Division of Public Utilities, March, 2000.

"Building a Broadband America: The Competitive Keys to the Future of the Internet," prepared for The Competitive Broadband Coalition, May 1999.

"Broken Promises: A Review of Bell Atlantic-Pennsylvania's Performance Under Chapter 30," prepared for AT&T and MCI Telecommunications, June 1998.

"Analysis of Opportunities for Cross Subsidies Between GTA and GTA Cellular," prepared for Guam Cellular and Paging, submitted to the Guam Public Utilities Commission, July 11, 1997.

"Reply to Incumbent LEC Claims to Special Revenue Recovery Mechanisms," submitted in the Matter of Access Charge Reform in CC Docket 96-262, February 14, 1997.

"Assessing Incumbent LEC Claims to Special Revenue Recovery Mechanisms: Revenue opportunities, market assessments, and further empirical analysis of the 'Gap' between embedded and forward-looking costs," FCC CC Docket 96-262, January 29, 1997.

"Analysis of Incumbent LEC Embedded Investment: An Empirical Perspective on the 'Gap' between Historical Costs and Forward-looking TSLRIC," Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, FCC CC 96-98, May 30, 1996.

"Reply to X-Factor Proposals for the FCC Long-Term LEC Price Cap Plan," prepared for the Ad Hoc Telecommunications User Committee, submitted in FCC CC Docket 94-1, March 1, 1996.

"Establishing the X-Factor for the FCC Long-Terms LEC Price Cap Plan," prepared for the Ad Hoc Telecommunications User Committee, submitted in FCC CC Docket 94-1, December 1995.

"The Economic Viability of Stentor's 'Beacon Initiative,' exploring the extent of its financial dependency upon revenues from services in the Utility Segment," prepared for Unitel, evidence before the Canadian Radio-television and Telecommunications Commission, March 1995.

"Fostering a Competitive Local Exchange Market in New Jersey: Blueprint for Development of a Fair Playing Field," prepared for the New Jersey Cable Television Association, January 1995.

"The Enduring Local Bottleneck: Monopoly Power and the Local Exchange Carriers," Feb. 1994.

"A Note on Facilitating Local Exchange Competition," prepared for E.P.G., Nov. 1991.

"Testing for Effective Competition in the Local Exchange," prepared for the E.P.G., October 1991.

"A Public Good/Private Good Framework for Identifying Pots Objectives for the Public Switched Network" prepared for the National Regulatory Research Institute, October 1991.

"Report on the Status of Telecommunications Regulation, Legislation, and modernization in the states of Arkansas, Kansas, Missouri, Nebraska, Oklahoma and Texas," prepared for the Mid-America Cable-TV Association, December 13, 1990.

"The U S Telecommunications Infrastructure and Economic Development," presented at the 18th Annual Telecommunications Policy Research Conference, Airlie, Virginia, October 1990.

"An Analysis of Outside Plant Provisioning and Utilization Practices of US West Communications in the State of Washington," prepared for the Washington Utilities and Transportation Commission, March 1990.

"Sustainability of Competition in Light of New Technologies," presented at the Twentieth Annual Williamsburg Conference of the Institute of Public Utilities, Williamsburg, VA, December 1988.

"Telecommunications Modernization: Who Pays?," prepared for the National Regulatory Research Institute, September 1988.

"Industry Structure and Competition in Telecommunications Markets: An Empirical Analysis," presented at the Seventh International Conference of the International Telecommunications Society at MIT, July 1988.

"Market Structure and Competition in the Michigan Telecommunications Industry," prepared for the Michigan Divestiture Research Fund Board, April 1988.

"Impact of Interstate Switched Access Charges on Information Service Providers - Analysis of Initial Comments," submitted in FCC CC Docket No. 87-215, October 26, 1987.

"An Economic Analysis of the Impact of Interstate Switched Access Charge Treatment on Information Service Providers," submitted in FCC CC Docket No. 87-215, September 24, 1987.

"Regulation and Technological Change: Assessment of the Nature and Extent of Competition from a Natural Industry Structure Perspective and Implications for Regulatory Policy Options," prepared for the State of New York in collaboration with the City of New York, February 1987.

"BOC Market Power and MFJ Restrictions: A Critical Analysis of the 'Competitive Market' Assumption," submitted to the Department of Justice, July 1986.

"Long-Run Regulation of AT&T: A Key Element of a Competitive Telecommunications Policy," *Telematics*, August 1984.

"Economic and Policy Considerations Supporting Continued Regulation of AT&T," submitted in FCC CC Docket No. 83-1147, June 1984.

"Multi-product Transportation Cost Functions," MIT Working Paper, September 1982.

Record of Prior Testimony

2011

Before the **Public Utilities Commission of Ohio,** *In the Matter of the Application of Columbus Southern Power Company and Ohio Power Company, Individually and, if Their Proposed Merger is Approved, as a Merged Company (collectively, AEP Ohio) for an Increase in Electric Distribution Rates, Case No. 11-351-EL-AIR, Case No. 11-352-EL-AIR; In the Matter of the Application of Columbus Southern Power Company and Ohio Power Company, Individually and, if Their Proposed Merger is Approved, as a Merged Company (collectively, AEP Ohio) for Tariff Approval, Case No. 11-353-EL-ATA Case No. 11-354-EL-ATA; In the Matter of the Application of Columbus Southern Power Company and Ohio Power Company, Individually and, if Their Proposed Merger is Approved, as a Merged Company (collectively, AEP Ohio) for Approval to Change Accounting Methods, Case No. 11-356-EL-AAM, Case No. 11-258-EL-AAM.*filed October 24, 2011.

Before the **Virginia State Corporation Commission**, *In the Matter of Determining Appropriate Regulation of Pole Attachments and Cost Sharing in Virginia,* Case No. PUE-2011-00033, Affidavit submitted June 22, 2011, Oral Testimony given July 13, 2011.

Before the **Public Utility Commission of Texas**, State Office of Administrative Hearings, *Petition of CPS Energy for Enforcement Against AT&T Texas and Time Warner Cable Regarding Pole Attachments,* SOAH Docket No. 473-09-5470, PUC Docket No. 36633, Supplemental Testimony submitted March 17, 2011; Further Supplemental Testimony submitted April 22, 2011, Cross-examination, September 13, 2011.

2010

Before the General **Court of Justice Superior Court Division, State of North Carolina, County of Rowan,** *Time Warner Entertainment– Advance/Newhouse Partnership, Plaintiff, V. Town Of Landis, North Carolina, Defendant*, 10 CVS 1172, submitted October 20, 2010, Deposition December 1, 2010, Cross-examination July 20, 2011.

Before the **Federal Communications Commission**, *In the Matter of Implementation of Section 224 of the Act; Amendment of the Commission's Rules and Policies Governing Pole Attachments,* WC Docket No. 07-245, GN Docket No. 09-51. Report submitted August 16, 2010, Attachment A to Comments filed by the National Cable and Telecommunications Association.

Before the **Public Utility Commission of Texas**, State Office of Administrative Hearings, *Petition of CPS Energy for Enforcement Against AT&T Texas and Time Warner Cable Regarding Pole Attachments,* SOAH Docket No. 473-09-5470, PUC Docket No. 36633, Direct Testimony submitted July 23, 2010.

Before the **Kentucky Public Service Commission**, *In the Matter of: Application of Kentucky Utilities Company for An Adjustment of its Base Rates*, Case No. 2009-00548, submitted April 22, 2010.

Before the **Kentucky Public Service Commission** *In the Matter of: Application of Louisville Gas and Electric Company for An Adjustment of its Electric and Gas Base Rates*, Case No. 2009-00549, submitted April 22, 2010.

Before the **Arkansas Public Service Commission**, *Coxcom, Inc., D/B/A Cox Communications, Complainant V. Arkansas Valley Electric Cooperative Corporation*, R*espondent.* Docket No. 09-133-C, submitted March 17, 2010.

2009

Before the **Circuit Court of the Thirteenth Judicial Circuit in and for Hillsborough County**, *State of Florida, Tampa Electric Company, Plaintiff, vs. Bright House Networks, LLC, Defendant,* Case No. 06-00819, Division L. Expert Report submitted December 30, 2009, Deposition February 2, 2010, Cross-examination, March 24, 2010.

Before the **Superior Court of the State Of Washington for the County of Pacific,**, *Pacific Utility District No. 2 Of Pacific County, Plaintiff, V. Comcast of Washington Iv, Inc., Centurytel of Washington,*

Inc., and Falcon Community Ventures I, L.P. D/B/A Charter Communications, Defendants, Case No. 07-2-00484-1, Expert Report submitted September 18, 2009, Reply Report submitted October 16, 2009, Deposition December 21, 2009, Deposition December 21, 2009, Cross-examination October 12-13, 2010.

Before the **Public Utilities Commission of Ohio,** *In the Matter of the Application of Duke Energy Ohio, Inc., for an Increase in Electric Distribution Rates, Case No. 08-709-EL-AIR,In the Matter of the Application of Duke Energy Ohio, Inc., for a Tariff Approval, Case No. 08-710-EL-ATA, In the Matter of the Application of Duke Energy Ohio, Inc., for Approval to Change Accounting Methods, Case No. 08-11-EL-AAM, In the Matter of the Application of Cincinnati Gas & Electric Company for Approval of its Rider BDP, Backup Delivery Point, Case No. 06-718-EL-ATA,* filed February 26, 2009.

2008

Before the **Arkansas Public Service Commission**, *In the Matter of a Rulemaking Proceeding to Establish Pole Attachment Rules In Accordance With Act 740 of 2007*, Docket No. 08-073-R, filed May 13, 2008, reply filed June 3, 2008, Cross-examination June 10, 2008.

Before the **Federal Communications Commission**, *In the Matter of Implementation of Section 224 of the Act; Amendment of the Commission's Rules and Policies Governing Pole Attachments,* WC Docket No. 07-245, RM 11293, RM 11303, filed March 7, 2008, reply filed April 22, 2008.

2006

Before the **State of New Jersey Board of Public Utilities**, Office of Administrative Law, *in the Matter of the Verified Petition of TCG Delaware Valley, Inc. and Teleport Communications New York for an Order Requiring PSE&G Co. to Comply with the Board's Conduit Rental Regulations*, OAL Docket PUC 1191-06, BPU Docket No. EO0511005, filed September 29, 2006; rebuttal filed November 17, 2006.

Before the **Federal Communications Commission**, *In the Matter of Florida Cable Telecommunications Association, Inc., Comcast Cablevision of Panama City, Inc.; Mediacom Southeast, L.L.C.; and Cox Communications Gulf, L.L.C.; Complainants v. Gulf Power Company, Respondent.* EB Docket No. 04-381. Testimony on behalf of Complainants filed March 31, 2006, Deposition March 15, 2006, Cross-Examination April 26-27, 2006.

2005

Before the **United States District Court for the Eastern District of New York**, *Coastal Communication Service, Inc. and Telebeam Telecommunications Corporation, Plaintiffs - against –The City of New York and New York City Department of Information Technology and Telecommunications*, 02 Civ. 2300 (RJD) (SMG), Expert Report filed February 4, 2005; Rebuttal Expert Report, filed August 29, 2005, Deposition December 1, 2005.

2004

Before the **Ontario Energy Board**, *In the Matter of the Ontario Energy Board Act* 1998, S.O.1998, c.15, (Schedule B); and *In the Matter of an Application pursuant to section 74 of the Ontario Energy Board Act*, 1998 by the Canadian Cable Television Association for an Order or Orders to amend the licenses of electricity distributors, RP-2003-024, Reply Evidence, filed September 27, 2004 (jointly with Paul Glist), Cross-examination October 26-27, 2004.

2003

Before the **United States District Court for the Southern District of California,** *Level 3 Communications, LLC v. City of Santee,* Civil Action No. 02-CV-1193, Rebuttal Expert Report, filed July 18, 2003.

2002

Before the **New York State Public Service Commission**, *In the Matter of the Cable Television & Telecommunications Association of New York, Inc., Petitioner, v. Verizon New York, Inc., Respondent*, Case 02-M-1636, Affidavit filed December 19, 2002.

Before the **West Virginia Public Service Commission**, Community Antenna Service, Inc. v. Charter Communications, Case No. 01-0646-CTV-C, Live Direct Testimony and Cross-examination, June 12, 2002.

Before the **Public Service Commission of the District of Columbia,** Comcast Cablevision of the District, L.L.C., Complainant, v. Verizon Communications Inc. – Washington, D.C., Respondent, Formal Case No. 1006, Direct Testimony filed June 11, 2002; Rebuttal Testimony filed June 24, 2002.

Before the **Federal Communications Commission,** in *Cavalier Telephone, LLC, Complainant, v. Virginia Electric & Power Co., D/b/a Dominion Virginia Power, Respondent*, Case No. EB-02-MD-005, Declaration filed May 21, 2002.

Before the **Puerto Rico Telecommunications Regulatory Board**, in *Re: Petition of Centennial Puerto Rico License Corp. for arbitration pursuant to Sections 252(b) of the Telecommunications Act of 1996 to Establish an Interconnection Agreement with Puerto Rico Telephone Company*, on behalf of Centennial Puerto Rico License Corp., Direct Testimony filed April 16, 2002; Deposition May 7, 2002, May 14, 2002; Reply Testimony filed May 20, 2002, Cross-examination May 22, 2002.

Before the **Federal Energy Regulatory Commission***, in Re: In the Matter of* ***Transcontinental Gas Pipe Line Corporation,*** Docket No. RP01-245, on behalf of the University of Maryland-College Park, Johns Hopkins University and Johns Hopkins University Health System, and the North Carolina Utilities Commission, Cross-answering Testimony filed January 23, 2002; Rebuttal Testimony filed May 31, 2002, Cross-examination July 31, 2002.

2001

Before the **United States District Court for the Northern District of New York**, *TC Systems, Inc. and Teleport Communications-New York vs. Town of Colonie, New York,* Civil Action No. 00-CV-1972, Expert Report filed November 16, 2001; Deposition December 7, 2001, Rebuttal Expert Report filed December 20, 2001, Deposition January 9, 2002.

Before the **Federal Energy Regulatory Commission***, in Re: In the Matter of* ***Transcontinental Gas Pipe Line Corporation,*** Docket No. RP01-245, on behalf of the University of Maryland-College Park, Johns Hopkins University and Johns Hopkins University Health System, and the North Carolina Utilities Commission, filed November 15, 2001.

Before the **Public Service Commission of the District of Columbia,** Comcast Cable Communications, Inc. d/b/a/Comcast Cable of Washington, D.C., Complainant, v. Verizon Communications Inc. – Washington, D.C., Respondent, filed September 21, 2001.

Before the **Public Utility Commission of Texas**, State Office of Administrative Hearings, SOAH Docket No. 473-00-1014, PUC Docket No. 22349, *Application of Texas-New Mexico Power Company for Approval of Unbundled Cost of Service Rate Pursuant to PURA § 39.201and Public Utility Commission Substantive Rule §25.344*, on behalf of Cities Served by Texas-New Mexico Power, filed January 25, 2001.

2000

Before the **Puerto Rico Telecommunications Regulatory Board**, in *AT&T of Puerto Rico, Inc. et al v. Puerto Rico Telephone Company, Inc.,Re: Dialing Parity,* Docket Nos. 97-Q-0008, 98-Q-0002*,* on behalf of Lambda Communications Inc., Cross-examination October 19-20, 2000.

Before the **Department of Telecommunications and Energy of the Commonwealth of Massachusetts**, Docket No. DTE 98-57 – Phase III, *Re: Bell Atlantic- Massachusetts Tariff No. 17 Digital Subscriber Line Compliance Filing and Line Sharing Filing*, (Panel Testimony with Joseph Riolo, Robert Williams, and Michael Clancy) on behalf of Rhythms Links Inc. and Covad Communications Company, filed July 10, 2000.

Before the **New York State Public Service Commission** in *Re: Proceeding on Motion of the Commission to Examine New York Telephone Company's Rates for Unbundled Network Elements* on behalf of the Cable Television & Telecommunications Association of New York, Inc., Direct Testimony filed June 26, 2000, Supplemental Testimony filed November 29, 2000.

Before the **Maryland Public Service Commission**, on behalf of Rhythms Links Inc. and Covad Communications Company, filed jointly with Terry L. Murray and Richard Cabe, May 5, 2000.

Before the **Public Utility Commission of Texas**, in *Re: Proceeding to Examine Reciprocal Compensation Pursuant to Section 252 of the Federal Telecommunications Act of 1996,* CC Docket No. 21982, on behalf of AT&T Communications of Texas, L.P., TCG Dallas, and Teleport Communications Houston, Inc., filed March 31, 2000.

Before the **Federal Communications Commission**, in *Re: In the Matter of Price Caps Performance Review for Local Exchange Carriers, Access Charge Reform*, CC Dockets 94-1, 96-262, on behalf of Ad Hoc Telecommunications Users Committee, filed January 24, 2000.

Before the **Federal Energy Regulatory Commission**, in *Re: In the Matter of Northern Border Pipeline Company*, on behalf of the Canadian Association of Petroleum Producers and the Alberta Department of Resource Development, filed January 20, 2000.

1999

Before the **Connecticut Department of Public Utilities**, in *Re: Evaluation and Application to Modify Franchise Agreement by SBC Communications Inc., Southern New England telecommunications Corporation and SNET Personal Vision, Inc.*, Docket No. 99-04-02, on behalf of the Office of Consumer Counsel, filed June 22, 1999; cross- examination July 8, 1999

Before the **Illinois Commerce Commission**, in *Re: Illinois Commerce Commission on its own Motion v. Illinois Bell Telephone Company; et al: Investigation into Non-Cost Based Access Charge Rate Elements in the Intrastate Access Charges of the Incumbent Local Exchange Carriers in Illinois, Illinois Commerce Commission on its own Motion Investigation into Implicit Universal Service Subsidies in Intrastate Access Charges and to Investigate how these Subsidies should be Treated in the Future, Illinois Commerce Commission on its own motion Investigation into the Reasonableness of the LS2 Rate of Illinois Bell Telephone Company*, Docket No. 97-00601, 97-0602, 97-0516, Consolidated, on behalf of City of Chicago, filed January 4, 1999; rebuttal February 17, 1999.

Before the **Puerto Rico Telecommunications Regulatory Board**, in *Re: In the Matter of Arbitration of Interconnection Rates, Terms and Conditions between Centennial Wireless PCS Operations Corp., Lambda Communications Inc., and the Puerto Rico Telephone Company*, behalf of Centennial Wireless PCS Operations Corp. and Lambda Communications Inc., cross-examination February 16, 1999.

1998

Before the **California Public Utilities Commission**, in *Re: In the Matter of the Application of Pacific Bell (U 1001 C), a Corporation, for Authority for Pricing Flexibility and to Increase Prices of Certain Operator Services, to Reduce the Number of Monthly Assistance Call Allowances, and Adjust Prices for Four Centrex Optional Features*, Application No. 98-05-038, on behalf of County of Los Angeles, filed November 17, 1998, cross-examination, December 9, 1998.

Before the **Puerto Rico Telecommunications Regulatory Board**, in *Re: In the Matter of PRTC's Tariff K-2 (Intra-island access charges)*, Docket no. 97-Q-0001, 97-Q-0003, on behalf of Lambda Communications, Inc., filed October 9, 1998, cross-examination October 9, 1998.

Before the **Connecticut Department of Public Utility Control**, in *Re: Application of the Southern New England Telephone Company*, Docket no. 98-04-03, on behalf of the Connecticut Office of Consumer Counsel, filed August 17, 1998, cross-examination February 18, 1999.

Before the **California Public Utilities Commission**, in *Re: Pacific Gas & Electric General Rate Case*, A.97-12-020, on behalf of Office of Rate Payers Advocates CA PUC, filed June 8, 1998.

1997

Before the **South Carolina Public Service Commission**, in *Re: Proceeding to Review BellSouth Telecommunications, Inc.'s Cost for Unbundled Network Elements*, Docket no. 97-374-C, on behalf of the South Carolina Cable Television Association, filed November 17, 1997.

Before the **State Corporation Commission of Kansas**, in *Re: In the Matter of and Investigation to Determine whether the Exemption from Interconnection Granted by 47 U.S.C. 251(f) should be Terminated in the Dighton, Ellis, Wakeeney, and Hill City Exchanges*, Docket No. 98-GIMT-162-MIS, on behalf of Classic Telephone, Inc., filed October 23, 1997.

Before the **Georgia Public Services Commission,** in *Re: Review of Cost Studies, Methodologies, and Cost-Based Rates for Interconnection and Unbundling of BellSouth Telecommunications Services*, Docket No. 7061-U, on behalf of the Cable Television Association of Georgia, filed August 29, 1997, cross-examination September 19, 1997.

Before the **Federal Communications Commission**, in *Re: In the Matter of Price Caps Performance Review for Local Exchange Carriers, Access Charge Reform*, CC Dockets 94-1, 96-262, on behalf of Ad Hoc Telecommunications Users Committee, filed July 11, 1997.

Before the **Federal Communications Commission**, in *Re: In the Matter of Amendment of Rules and Policies Governing Pole Attachments*, CS Docket 97-98, on behalf of NCTA, filed June 27, 1997.

Before the **Public Utilities Commission of the State of California**, in *Re: Rulemaking on the Commission's Own Motion to Govern Open Access to Bottleneck Services and Establish a Framework for Network Architecture Development of Dominant Carrier Networks*, R.93-04-003, I.93-04-002AT&T, filed March 19, 1997, reply April 7, 1997.

Before the **Puerto Rico Telecommunications Regulatory Board**, in *Re: In the Matter of Centennial Petition for Arbitration with PRTC,* on behalf of Centennial Cellular Corporation, filed February 14, 1997, supplemental March 10, 1997.

Before the **Federal Communications Commission**, in *Re: In the Matter of Access Charge Reform*, CC Docket 96-262, on behalf of AT&T, filed January 29, 1997, reply February 14, 1997.

1996

Before the **New Jersey Board of Public Utilities**, in *Re: In the Matter of the Investigation Regarding Local Exchange Competition for Telecommunications Services*, TX95120631, on behalf of New Jersey Cable Television Association, filed on August 30, 1996, reply September 9, 1997, October 20, 1997, cross-examination September 12, 1996, December 20, 1996.

Before the **State Corporation Commission of the State of Kansas**, in *Re: In the Matter of a General Investigation Into Competition Within the Telecommunications Industry in the State of Kansas*, 190, 492-U 94-GIMT-478-GIT, on behalf of Kansas Cable Telecommunications Association, Inc., filed July 15, 1996, cross-examination August 14, 1996.

Before the **Federal Communications Commission**, in *Re: Price Caps Performance Review for Local Exchange Carriers*, CC Docket 94-1, on behalf of Ad Hoc Telecommunications Users Committee, filed July 12, 1996.

Before the **State Corporation Commission of the State of Kansas**, in *Re: In the Matter of a General Investigation Into Competition Within the Telecommunications Industry in the State of Kansas*, 190, 492-U 94-GIMT-478-GIT, on behalf of Kansas Cable Telecommunications Association, Inc., filed June 14, 1996, cross-examination August 14, 1996.

Before the **Federal Communications Commission**, in *Re: In the Matter of Implementation of the Local Competition Provisions of Telecommunications Act of 1996*, CC Docket 96-98, filed May 1996.

Before the **Federal Communications Commission**, in *Re: Puerto Rico Telephone Company (Tariff FCC No, 1)*,Transmittal No. 1, on behalf of Centennial Cellular Corp., filed April 29, 1996.

Before the **United States District Court for the Eastern District of Tennessee at Greeneville**, in *Re: Richard R. Land, Individually and d/b/a The Outer Shell, and on behalf of all others similarly situated, Plaintiffs, vs. United Telephone-Southeast, Inc., Defendant*, CIV 2-93-55, filed December 7, 1996.

1995

Before the **Federal Communications Commission**, in *Re: Bentleyville Telephone Company Petition and Waiver of Sections 63.54 and 63.55 of the Commission's Rules and Application for Authority to Construct and Operate, Cable Television Facilities in its Telephone Service Area*, W-P-C-6817, on behalf of the Helicon Group, L.P. d/b/a Helicon Cablevision, filed November 2, 1995.

Before the **US District Court for the Eastern District of Tennessee**, in *Re: Richard R. Land, Individually and d/b/a The Outer Shell, and on behalf of all others similarly situated, Plaintiffs, vs. United Telephone-Southeast, Inc., Defendant*, 2-93-55, Class Action, filed June 12, 1995.

Before the **Connecticut Department of Public Utility Control**, in *Re: Application of SNET Company for approval to trial video dial tone transport and switching*, 95-03-10, on behalf of New England Cable TV Association, filed May 8, 1995, cross-examination May 12, 1995.

Before **Canadian Radio-Television and Telecommunications Commission**, in *Re: CRTC Order in Council 1994-1689*, Public Notice CRTC 1994-130 (Information Highway), filed March 10, 1995.

Before the **Federal Communications Commission**, in *Re: GTE Hawaii's Section 214 Application to provide Video Dialtone in Honolulu, Hawaii*, W-P-C- 6958, on behalf of Hawaii Cable TV Association, filed January 17, 1995 (Reply to Amended Applications).

Before the **Federal Communications Commission**, in *Re: GTE Hawaii's Section 214 Application to provide Video Dialtone in Ventura County*, W-P-C 6957, on behalf of the California Cable TV Association, filed January 17, 1995 (Reply to Amended Applications).

Before the **Federal Communications Commission**, in *Re: GTE Florida's Section 214 Application to Provide Video Dialtone in the Pinellas County and Pasco County, Florida areas*, W-P-C 6956, on behalf of Florida Cable TV Association, filed January 17, 1995 (Reply to Amended Applications).

Before the **Federal Communications Commission**, in *Re: GTE Virginia's Section 214 Application to provide Video Dialtone in the Manassas, Virginia area*, W-P-C 6956, on behalf of Virginia Cable TV Association, filed January 17, 1995 (Reply to Amended Applications).

1994

Before the **Federal Communications Commission**, in *Re: NET's Section 214 Application to provide Video Dialtone in Rhode Island and Massachusetts*, W-P-C 6982, W-P-C 6983, on behalf of New England Cable TV Association, filed December 22, 1994 (Reply to Supp. Responses).

Before the **State Corporation Commission of the State of Kansas**, in *Re: General Investigation into Competition*, 190, 492-U 94-GIMT-478-GIT, on behalf of Kansas CATV Association, filed November 14, 1994, cross-examination December 1, 1994.

Before the **Federal Communication Commission**, in *Re: Carolina Telephone's Section 214 Application to provide Video Dialtone in areas of North Carolina*, W-P-C 6999, on behalf of North Carolina Cable TV Association, filed October 20, 1994, reply November 8, 1994.

Before the **Federal Communication Commission**, in *Re: NET's Section 214 Application to provide Video Dialtone in Rhode Island and Massachusetts*, W-P-C 6982, W-P-C 6983, on behalf of New England Cable TV Association, filed September 8, 1994, reply October 3, 1994.

Before the **California Public Utilities Commission**, in *Re: Petition of GTE-California to Eliminate the Preapproval Requirement for Fiber Beyond the Feeder*, I.87-11-033, on behalf of California Bankers Clearing House, County of LA, filed August 24, 1994.

Before the **Federal Communications Commission**, in *Re: BellSouth Telecommunications Inc., Section 214 Application to provide Video Dialtone in Chamblee, GA and Dekalb County, GA*, W-P-C 6977, on behalf of Georgia Cable TV Association, filed August 5, 1994.

Before the **Federal Communications Commission**, in *Re: Bell Atlantic Telephone Companies Section 214 Application to provide Video Dialtone within their Telephone Services Areas*, W-P-C 6966, on behalf of Mid Atlantic Cable Coalition, filed July 28, 1994, reply August 22, 1994.
Before the **Federal Communication Commission**, in *Re: GTE Hawaii's 214 Application to provide Video Dialtone in Honolulu, Hawaii*, W-P-C 6958, on behalf of Hawaii Cable TV Association, filed July 1, 1994, and July 29, 1994.

Before the **Federal Communication Commission**, in *Re: GTE California's Section 214 Application to provide Video Dialtone in Ventura County*, W-P-C 6957, on behalf of California Cable TV Association, filed July 1, 1994, and July 29, 1994.

Before the **Federal Communication Commission**, in *Re: GTE Florida's 214 Application to provide Video Dialtone in the Pinellas and Pasco County, Florida areas*, W-P-C 6956, on behalf of Florida Cable TV Association, filed July 1, 1994, and July 29, 1994.

Before the **Federal Communication Commission**, in *Re: GTE Virginia's 214 Application to provide Video Dialtone in the Manassas, Virginia area*, W-P-C 6955, on behalf of the Virginia Cable TV Association, filed July 1, 1994, and July 29, 1994.

Before the **Federal Communications Commission**, in *Re: US WEST's Section 214 Application to provide Video Dialtone in Boise, Idaho and Salt Lake City, Utah*, W-P-C 6944-45, before the Idaho and Utah Cable TV Association, filed May 31, 1994.

Before the **Federal Communication Commission**, in *Re: US WEST's Section 214 Application to provide Video Dialtone in Portland, OR; Minneapolis, St. Paul, MN; and Denver, CO*, W-P-C 6919-22, on behalf of Minnesota & Oregon Cable TV Association, filed March 28, 1994.

Before the **Federal Communications Commission**, in *Re: Ameritech's Section 214 Application to provide Video Dialtone within areas in Illinois, Indiana, Michigan, Ohio, and Wisconsin*, W-P-C-6926-30, on behalf of Great Lakes Cable Coalition, filed March 10, 1994, reply April 4, 1994.

Before the **Federal Communications Commission**, in *Re: Pacific Bell's Section 214 Application to provide Video Dialtone in Los Angeles, Orange County, San Diego, and Southern San Francisco Bay areas*, W-P-C-6913-16, on behalf of Comcast/Cablevision Inc., filed Feb. 11, 1994, reply March 11, 1994.

Before the **Federal Communications Commission**, in *Re: SNET's Section 214 Application to provide Video Dialtone in Connecticut*, W-P-C 6858, on behalf of New England Cable TV Association, filed January 20, 1994, reply February 23, 1994.

1993

Before the **Arkansas Public Service Commission**, in *Re: Earnings Review of Southwestern Bell Telephone Company*, 92-260-U, on behalf of Arkansas Press Association, filed September 2, 1993.

Before the **United States District Court for the Eastern District of Tennessee at Greenville**, in *Re: Cleo Stinnett, et al. Vs. BellSouth Telecommunications, Inc. d/b/a/ South Central Bell Telephone Company, Defendant*, Civil Action No 2-92-207, Class Action, cross-examination May 10, 1993, and Feb. 10, 1994.

Before the **Federal Communications Commission**, in *Re: NJ Bell's Section 214 Application to provide Video Dialtone service within Dover Township, and Ocean County, New Jersey*, W-P-C-6840, on behalf of New Jersey Cable TV Association, filed January 21, 1993.

1992

Before the **New Jersey Board of Regulatory Commissioners**, in *Re: NJ Bell Alternative Regulation*, T092030358, on behalf of NJ Cable TV Association, filed September 21, 1992.

Before the **New Hampshire Public Utilities Commission**, in *Re: Generic competition docket*, DR 90-002, on behalf of Office of the Consumer Advocate, filed May 1, 1992, reply July 10, 1992, Surrebuttal August 21, 1992.

Before the **New Jersey General assembly Transportation, Telecommunications, and Technology Committee**, *Concerning A-5063*, on behalf of NJ Cable TV Association, filed January 6, 1992.

1991

Before the **New Jersey Senate Transportation and Public Utilities Committee**, in *Re: Concerning Senate Bill S-3617*, on behalf of New Jersey Cable Television Association, filed December 10, 1991.

Before the **119th Ohio General Assembly Senate Select Committee on Telecommunications Infrastructure and Technology**, in *Re: Issues Surrounding Telecommunications Network Modernization*, on behalf of the Ohio Cable TV Association, filed March 7, 1991.

Before the **Tennessee Public Service Commission**, in *Re: Master Plan Development and TN Regulatory Reform Plan*, on behalf of TN Cable TV Association, filed February 20, 1991.

1990

Before the **Tennessee Public Service Commission**, in *Re: Earnings Investigation of South Central Bell,* 90-05953, on behalf of the TN Cable Television Association, filed September 28, 1990.

Before the **New York Public Service Commission**, in *Re: NYT Rates, 90-C-0191, on behalf of User Parties NY Clearing House Association*, filed July 13, 1990, Surrrebuttal July 30, 1990.

Before the **Louisiana Public Service Commission,** in *Re: South Central Bell Bidirectional Usage Rate Service*, U-18656, on behalf of Answerphone of New Orleans, Inc., Executive Services, Inc., King Telephone Answering Service, et al, filed January 11, 1990.

1989

Before the **Georgia Public Service Commission**, in *Re: Southern Bell Tariff Revision and Bidirectional Usage Rate Service*, 3896-U, on behalf of Atlanta Journal Const./Voice Information Services Company, Inc., GA Association of Telemessaging Services, Prodigy Services, Company, Telnet Communications, Corp., filed November 28, 1989.

Before the **New York State Public Service Commission**, in *Re: NYT Co. - Rate Moratorium Extension - Fifth Stage Filing*, 28961 Fifth Stage, on behalf of User Parties NY Clearing House Association Committee of Corporate Telecommunication Users, filed October 16, 1989.

Before the **Delaware Public Service Commission**, in *Re: Diamond State Telephone Co. Rate Case*, 86-20, on behalf of DE PSC, filed June 16, 1989.

Before the **Arizona Corporation Committee**, in *Re: General Rate Case*, 86-20, on behalf of Arizona Corporation Committee, filed March 6, 1989.

1988

Before **New York State Public Service Commission**, in *Re: NYT Rate Moratorium Extension*, 28961, on behalf of Capital Cities/ ABC, Inc., AMEX Co., CBS, Inc., NBC, Inc., filed December 23, 1988.

1989

Before **Rhode Island Public Utilities Commission**, in *Re: New England Telephone*, 1475, on behalf of RI Bankers Association, filed August 11, 1987, cross-examination August 21, 1987.

Before the **New York State Public Service Commission**, in *Re: General Rate Case Subject to Competition*, 29469, on behalf of AMEX Co., Capital Cities/ ABNC, Inc., NBC, Inc., filed April 17, 1987, cross-examination May 20, 1987.

Before the **Minnesota Public Utilities Commission**, in *Re: Northwestern Bell*, P-421/ M-86-508, on behalf of MN Bus. Utilities Users Counsel, filed February 10, 1987, cross-examination March 5, 1987.

1986

Before the **Kansas Public Utilities Commission**, in *Re: Southwestern Bell*, 127, 140-U, on behalf of Boeing Military, et al., filed August 15, 1986.

1985

Before the **Washington Utilities and Transportation Commission**, in *Re: Cost of Service Issues bearing on the Regulation of Telecommunications Company*, on behalf of US Department of Energy, filed November 18, 1985 (Reply Comments).

1984

Before the **Maine Public Utilities Commission**, in *Re: New England Telephone*, 83-213, on behalf of Staff, ME PUC, filed February 7, 1984, cross-examination March 16, 1984.

Before the **Kentucky Public Service Commission**, in *Re: South Central Bell*, U-4415, on behalf of MS PSC, filed January 24, 1984, cross-examination February 1984.

1983

Before the **Kentucky Public Service Commission**, in *Re: South Central Bell*, 8847, on behalf of KY PSC, filed November 28, 1983, cross-examination December 1983.

Before the **Florida Public Service Commission**, in *Re: Southern Bell Rate Case*, 820294-TP, on behalf of Florida Department of General Services, FL Ad Hoc Telecommunications Users, filed March 21, 1983, cross-examination May 5, 1983.

1982

Before the **Maine Public Utilities Commission**, in *Re: New England Telephone*, 82-142, on behalf of Staff, ME PUC, filed November 15, 1982, cross-examination December 9, 1982.

Before the **Kentucky Public Service Commission**, in *Re: South Central Bell*, 8467, on behalf of the Commonwealth of Kentucky, cross-examination August 26, 1982.