

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

In the Matter of:

Technology Transitions

Connect America Fund and Next
Generation Network Experiments in Rural
America

GN Docket No. 13-5

WC Docket No. 10-90

Reply Comments of PC Telecom

Erik J. Cecil, Esq.
9769 W. 119th Dr.
Suite 32
Broomfield CO 80021
(720) 319-7328

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PC Telecom, the CLEC arm of Phillips County Telephone Company (PCTC), a rate-regulated rural cooperative, respectfully submit these reply comments in response to the Further Notice of Proposed Rulemaking included with the IP Experiments Order and FNPRM released by the Federal Communications Commission (the "Commission") on January 31, 2014.¹

I. INTRODUCTION

The Commission's task in these technology transition proceedings is daunting if not overwhelming. Technological developments of the past thirty years have resulted in ubiquity of distributed, mobile, and virtual application and service infrastructures that permeates nearly every aspect of our physical environment. Copper, coax, fiber optic, mobile, fixed and satellite wireless technologies are employed together, alone or in combination to connect this exploding array of devices from computer to cars to drones, clothing, wearable computers and near infinite array of software defined services within, between and among increasingly smaller and ubiquitous units of computational power while network capacity must upgrade to meet still geometric increases in network capacity and performance requirements. Regulatory application, however, remains uneven.

Against this backdrop, the Commission laudably and courageously seeks to begin to resolve these mismatches by requesting Rural Broadband Experiments.

¹ *In the Matter of Technology Transitions, GN Docket No. 13-5, AT&T Petition to Launch a Proceeding Concerning the TDM-to-IP Transition, GN Docket No. 12-353, Connect America Fund, WC Docket No. 10-90, Structure and Practices of the Video Relay Service Program, CG Docket No. 10-51, Telecommunications Relay Services And Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities, CG Docket No. 03-123, Numbering Policies for Modern Communications, WC Docket No. 13-97, Order, Report and Order and Further Notice of Proposed Rulemaking, Report and Order, Order and Further Notice of Proposed Rulemaking, Proposal for Ongoing Data Initiative, FCC 14-5 (rel. Jan. 31, 2014) ("IP Experiments Order and FNPRM" or "FNPRM").*

II. RURAL BROADBAND BUDGET

In the Further NPRM, the Commission invites comment on its proposal to fund rural broadband experiments out of unallocated funds from the Connect America Fund.² The FCC proposes that a limited amount of these unallocated funds be made available for experiments in any part of the country, whether served by an incumbent price cap carrier or rate-of-return carrier. The Commission believes that unallocated funds for rural experiments will inform existing and future CAF competitive bidding processes as well as identify ways to better allocate federal funds.³

- a. *There is no dispute that the Rural Broadband Experiments must be funded; the only dispute appears to be how much.*

Overall, there appears complete agreement that funds should be allocated for the Rural Broadband Experiments. While some commenters may have concerns about actual implementation of the program, few, if any reject the funding. The main area of concern appears to be around the total amount allocated to the Rural Broadband Experiments. Generally the larger incumbent interests support a \$50-\$100 million range, while the rural communities, smaller rural carriers and WISPS⁴ support a stronger long term commitment to funding networks in rural areas.⁵ When we look to the experience of actually funding any investment in any size communications networks, including those of the incumbent wireline carriers, for example, their request are always for longer term consistent support reflecting the actual realities of deploying networks. To fund on a one time up front basis without reference to the nature, parties-to, and circumstances of any particular Rural Broadband Experiment, may preclude certain experiments or favor others. Since the Commission has asked for experiments to be conducted across localities and in areas nationwide that may have vastly different geographic, weather, economic conditions, network attributes, parties to the enterprise and funding differences, allowing an experimental model to adapt to its unique circumstances is consistent with creating new real-world data on how a rapidly changing industry can productively evolve.⁶

² See *FNRPM* at ¶ 203 (explaining that CAF funds have accumulated in the reserve account and that a limited amount of funding could be awarded for experiments in 2014 from the reserve account without exceeding the overall \$4.5 billion annual budget for the Connect America Fund.)

³ *Id.*

⁴ *Comments of WISPA* at p.7.

⁵ See, e.g. *Comments of WTA*, WC 10-90, at p.2 (The Commission must ensure “substantially greater universal service support for the deployment and operation of higher capacity, urban-comparable broadband infrastructure in rural high cost areas.”); *Comments of Utilities Telecom Council*, WC 10-90, at p. 4 (\$50-\$100 million is insufficient for meaningful broadband experiments).

⁶ See *FNRPM* at ¶ 98.

III. EVALUATION CRITERIA

a. Cost Effectiveness

- i. *With meaningful guidelines, standards and obligations, the Commission can readily assess cost-effectiveness.*

USTA, in particular, opposes any increase above \$50-\$100 and appears to favor the lower amount because “rural broadband experiments would be an inappropriate use of USF support given the lack of strict guidelines or obligations and the loosely defined “experimental” quality of effort.”⁷ Experiments conducted without meaningful compliance with statutory mandates, actual adherence to the letter and spirit of policy directives, without understanding of the technologies deployed and their economics, unjustifiably slanted in favor of or disfavor of one or another network design, technology type or operator classification, put into service without actual technical, managerial, and financial qualification, selectively deployed to serve so-called “community anchor institutions”, which are actually the vast majority of steady higher-revenue locations in rural areas without obligation to serve all comers, not remotely experiments at all.

- ii. *With meaningful commitment to meaningful results, cost-effectiveness is achieved.*

With the transition to cloud computing and very high capacity mobile networks, the underlying broadband infrastructures must be capable of supporting increasingly greater capacities at very low latencies, low jitter, typically “five nines” of reliability and run over protected routes (i.e. “ringed” architectures). As the Commission notes, however, “the number of cell sites has grown from 51,600 cell sites in 1997 to 301,779 cell sites in 2012.”⁸ There is no question that the explosion of data traffic has changed the industry.⁹ Not only are more cellular towers required, as the Commission notes, but they also require direct fiber optic connections to handle loads point-to-point microwave backhaul is no longer handling as effectively.

⁷ *Comments of NCTA at p.4.*

⁸ *See FNRPM at ¶ 13 (citing Cellular Telecommunications Industry Association data from December of 2013).*

⁹ According to the *Cisco Visual Network Index* and its companion document “*The Zettabyte Era*” (May 29, 2013) for example, Global IP traffic has increased eightfold over the past 5 years, and will increase threefold over the next 5 years. Overall, IP traffic is estimated to grow at a compound annual growth rate (CAGR) of 29 percent from 2011 to 2016. The number of devices connected to IP networks will be nearly three times as high as the global population in 2016. PC-originated traffic will grow at a CAGR of 28 percent, while TVs, tablets, smartphones, and business Internet machine-to-machine (M2M) modules will have growth rates of 42 percent, 116 percent, 119 percent, and 86 percent, respectively. (*available at* http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-481360_ns827_Networking_Solutions_White_Paper.html).

If, assuming there are meaningful measurements and actual compliance with statutory intent of universal service, favoring “low cost” above all other considerations still predetermines experiment outcomes. Deploying lowest possible cost into high cost areas means nothing more than a race to the cheapest possible deployment that marginally improves the case for areas that are receiving less than 3mbps/768kbps. As applied, therefore, to meaningfully exploring new solutions to the nation’s most intractable of broadband problems in high cost rural areas, over-focus on “cost” alone repeats historical patterns that have denied many rural areas meaningful network capabilities. Accordingly, NCTA’s suggestion for projects is “subsidized cost per unserved location”¹⁰ artificially restricts the benefits side of the analysis to the narrowest possible number of users in the most desperately high cost and difficult areas to serve. Such a pursuit would create and reinforce self-fulfilling prophecies that rural broadband is simply “too hard” or “too expensive” or “too difficult” to fix, while at the same time, the Commission urges the nation to move ahead toward a 100mbps/50mbps national standard by 2020.¹¹

- iii. *Cost effectiveness does not mean cheapest; cost effectiveness means investment relative to business return, and in the universal service context, it is also relative to resulting benefit to individuals, businesses, communities and area economies.*

In a digital economy, one might characterize download as consumption while upload is production. While consumer-facing business models are predominantly designed around consumption, forward-looking views of technology trends indicate that higher capacity symmetrical or less asymmetrical capacity ratios invite and/or encourage greater economic activity. Location independent professionals, software developers, startup technology shops, the coming maker revolution empowered by three dimensional printers and the entire ecosystem of commoditized advanced high capacity computational power, require effective means of production and consumption. Like PC Tel, Vermont Telecommunications Authority¹² recommends that the Commission fund at levels sufficient to create experiments that actually mean something in a world where

¹⁰ *Comments NCTA at p.8.*

¹¹ *See Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps To Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act, GN Docket No. 12-228, Rel. No. FCC 12-91, Ninth Broadband Progress Notice Of Inquiry, 2012 LEXIS 3571, ¶ 16 (Rel. Aug. 21, 2012)*

¹² *See, Technologies Transitions Connect America Fund, GN Docket No. 13-5, WC Docket No. 10-90, Comments of Vermont Telecommunications Authority, at p. 2 (March 31, 2014) (Limiting funds only to current reserves inhibits construction of networks capable of meeting present needs while signaling lack of long-term commitment to non-federal entities who will therefore be less inclined to leverage their resources where their potential long-term risk and exposure is undermined by ephemeral and perhaps only passing federal curiosity).*

30mpbs/6mpbs is standard, 100mbps/50mpbs is the national goal¹³ and gigabit is no longer simply theory.¹⁴

At the same time, as NCTA notes, fiber optic networks are the “most expensive to deploy.”¹⁵ Interestingly, however, NCTA references a finding that examined the cost of fiber optic to the premises, not fiber transport, backhaul, or hybrid solutions. That same OBI technical paper also found that a greenfield hybrid-fiber coax deployment could be more expensive as RF over glass had potentially lower deployment costs (fewer electronics) and therefore lower operational costs.

Where NCTA apparently disfavors fiber optic, WISPA asks the Commission to “reward those fixed wireless applicants that seek the least amount of funding per unserved rural location.”¹⁶ Both technology-specific recommendations, however, elide real world capacity requirements driving fiber deeper into networks regardless of technology platform.¹⁷ Technology alone or cost-per user alone or cost per remotest location served alone therefore has nothing to do with whatever new, creative, interesting, relevant, useful, and legally compliant solutions the local broadband providers, carriers, communities and others can harmoniously and productively create.

b. *Technologically neutral determinations of cost-effectiveness must be technologically neutral.*

Technological neutrality, in the NCTA view appears to be “under no circumstance should subsidies be provided to any area where broadband service is already being provided” while competitive neutrality means “rejecting proposals from rural LECs for preferential treatment as to funding for experiments.” Setting aside the policy issues that determine broadband definitions on different factors in different contexts, many of the rural rate regulated LECs are already subject to overbuild because the prohibitions contained in the 1934 Communications Act, as amended, such as 47 U.S.C. § 251(f) are ineffective in the broadband context. So while we may pretend that the Commission can somehow prevent federal funding of overbuilding in the universal service context, outside of that context, it is basically a free-for-all. Even Comcast and Time-Warner cite completely deregulated Google as competitive pressure driving their merger. Accordingly, reliance upon the presence or absence of a regulatory distinction without reference to actual facts and circumstances does not create useful evaluative criteria for Rural Broadband Experiments.

¹³ *Id.*

¹⁴ See, e.g. Google in early discussions with 34 to deploy gigabit fiber optic. <https://fiber.google.com/newcities/>

¹⁵ *Comments of NCTA* at p.9.

¹⁶ *Comments of WISPA*, p.7

¹⁷ *Comments of RICA* at p. 5; see also n. 9.

In that respect, it is worth noting however, that market data, indicate that subscribers are not only cutting the wire, they are cutting the cable, as cable subscribership has dropped since 1999 and the same waves of consolidation that have resulted in the three RBOCs, or now, two RBOCs and a former RLEC, controlling 83% of the nation's telephone lines¹⁸ are also occurring in cable, where the two largest providers are merging.¹⁹

Consistent with USTA's concerns for evaluative rigor, NCTA's admonitions may have meaning relative to agreed upon and relevant measures of cost-effectiveness. Because for present purposes of CAF, 3mpbs/768mbps is "broadband" in rural America, it is very likely that the vast majority if not all cable MSOs, even analog systems, most price cap ILECs and nearly without question every rate regulated RLEC (who are smaller coops and intensively community-focused, not corporate profit driven, entities many of whom have built out fiber optic) might rest assured that no experimentation will occur in their territories. At a national level, however, cable MSOs and mobile wireless providers are fighting to and have successfully reduced state USF funds while also relieving RLECs from carrier of last resort obligations.²⁰ In this proceeding NCTA complains of the subsidies going to the large landline incumbents and recommends subsidization of deregulated fixed wireless providers to create "competition" in ILEC areas. Any approaches that reward a regulatory race to the bottom are incompatible with statutory duties not only to provide universal service, but to ensure the communications networks of this country actually operate in the public interest.

Accordingly, if we are to measure "technological neutrality" then it must have to mean that all technologies regardless of the presence or absence of regulatory classification must be examined in terms of the actual functionality provided to end users. So long as the Commission examines the actual connectivity provided, its actual capabilities within and relative to the full context and obligations of all providing it, and has in mind the long term health of the communities to be served, then there is the greater

¹⁸ *The Broadband Availability Gap*, OBI Technical Paper No. 1 at p.84 (April 2010). (Observing despite the fact that there are more than 1,311 Telco operators, the three RBOCs – AT&T, Verizon, and CenturyLink – own 83% of voice lines.) available at <http://download.broadband.gov/plan/the-broadband-availability-gap-obi-technical-paper-no-1.pdf>.

¹⁹ *See One sentence and six charts to explain why Comcast is buying Time Warner Cable*, Quartz, (Feb. 13, 2014) available at <http://qz.com/176837/one-sentence-and-six-charts-explain-why-comcast-is-buying-time-warner-cable/>; *See Comcast And Time Warner's Appalling Subscriber Numbers*, Business Insider (Feb. 13, 2014) available at: <http://www.businessinsider.com/comcast-and-time-warner-subscriber-losses-2014-2>.

²⁰ *See, e.g. The Year in Review: The Status of Telecommunications Deregulation in 2012*, NRRI, Sherry Litchburg, Ph.D. (June 2012) (Between 2010 and April 30, 2012, 21 state legislatures enacted laws that limit what PUCs can regulate. Nine of these states severely limited or completely eliminated COLR obligations and the requirement that carriers provide a tariffed basic local service product. All of these states eliminated PUC oversight of Voice over Internet Protocol (VoIP) or other IP-enabled services. As of the end of April 2012, deregulation legislation was pending in an additional 14 states.)

possibility that cost-effective Rural Broadband Experiments will yield meaningful and helpful data and real world experience upon which the foundation of additional policy analysis and forward-looking formulation may occur.

- c. Extent to which applicants propose innovative strategies to leverage non-Federal governmental sources of funding, such as State, local, or Tribal government funding.*

Obviously, it is not fiber optic in and of itself that is expensive. Rather it is the cost of either underground or aerial deployment (i.e. pole attachment) of any physical landline transport media that is the source of the expense. Of all of the landline transport media available no other comes remotely close to the scalability and operational expense of fiber optic. Fixed wireless is less expensive as a deployment option due to lower costs of physical deployment; however, there are limits to how much capacity is required and how long systems can operate on microwave backhaul alone before demand outstrips supply and landline backhaul –preferably fiber optic, is required.

Where broadband providers, community representatives, local, state, county and community representative and others can cooperate not only on forward-looking plans to ensure that any time streets are opened or upgrades or made for public water, sanitary sewer, storm drainage, street lights, underground power lines or other broadband, telecommunications or providers / utilities, but also to create, for purposes of Rural Broadband Experiments, public/private partnerships that could include conduit, regeneration and collocation infrastructures to support all providers, then the additional component of a lowered cost equation is added into the Rural Broadband Experiment and the possibility of new forms of analysis and economic equations become possible in ways that were not previously possible. Such a model also creates natural public/private partnerships between local, county and state governments because government becomes a partner rather than a competitor. This allows governments to place extremely stable and long term technological bets without interfering with the private market space or getting directly into the business of the additional costs and complexities associated with lighting, running, maintaining, securing and otherwise entering into a vastly accelerating and changing services, software, content, and application driven market.

Over time, where state transportation agencies could be encouraged to unlock their vice-like grip on and control over highway rights of way and the often abundant conduit already deployed to permit additional fiber optic and/or inner duct to be deployed (often at costs of under \$1 per foot, but may vary depending upon local factors), then the costs of backhaul drop and the ability to create even more diversity and a more robust network for all concerned increase. Wireless can, however, also have a role in certain areas as it has been used in mountainous areas with great success to provide alternative routes to Tier 1 peering locations where larger state or interstate highways do not run and/or where other secure underground or aerial routes – say high power transmission, railroad or oil pipeline – are simply too expensive or not available.

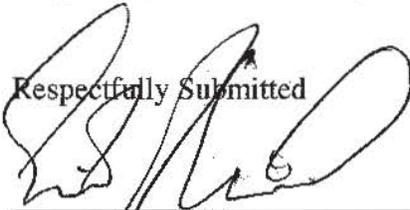
If the Commission begins to consider these and other seemingly creative, yet already used methods of reducing the costs of upgrading critical communications infrastructures, then perhaps the evaluation of Rural Broadband Experiments can also become less of a zero-sum game driving a cost- and/or public-service-obligation – race to the bottom.

IV. *The truth of any communications network is that ultimately the externalities of that network are, and forever have been, a public/private partnership.*

While the Commission and commenters both largely focus on a narrower as-applied to their business or community interest model, there is not a communications network in this nation that would disappear overnight but for federal, state and local governmental allocation of common public rights into the fundamental inputs to any communications system: use of public and private rights of way and/or use of spectrum, which is a public asset.

A Rural Broadband Experiment, therefore that serves the fundamental principles of Universal Service, frees communities to contribute to nondiscriminatory improvement of vital network resources, and also returns to the public more of the network externalities of connectivity through decreased cost and increased competition, then perhaps the incrementally fine and nearly impossible to assess cascading regulatory, business model and definitional complexities become less important and actual improvement to this nation's infrastructure in service of the public over any form of business model begins to return to the central focus of a federal agency whose unique statutory duty has always recognized the fundamental importance and power of the freedom to communicate in the form of the amorphous yet foundational principle of the "public interest" standard.

Respectfully Submitted



Erik J. Cecil, Esq.
9769 W. 119th Dr.
Suite 32
Broomfield CO 80021
(720) 319-7328

Attorney for: PC Telecom
520 S. Interocean Ave.
Holyoke, CO 80734