

uniquely qualified to “inform the development of a national broadband plan for our country.”² LARIAT recommends that the Commission facilitate the universal and ubiquitous deployment of high speed broadband by ensuring the availability of fairly priced connections and backhaul to the Internet backbone; by dedicating the AWS-3 spectrum to the specific purpose of providing wireless broadband service and allowing it to be licensed on a nonexclusive basis by wireless broadband providers; by increasing the allowable power limits on existing unlicensed spectrum for wireless broadband services, so as to increase the reach of these systems and overcome interference from consumer devices; and by forbearing from unnecessary regulation which would hobble innovation, competition, and entry into the Internet marketplace. LARIAT further recommends that the FCC, as an expert agency, inform the public of the correct usage of the terms “broadband” and “high speed Internet service” and base performance standards for the latter on multiple factors, including not only data throughput but also latency to the backbone.

2. PERFORMANCE CRITERIA FOR INTERNET SERVICE

At paragraph 15 *passim* of the *Notice*, the Commission requests comment on how to define “broadband capability.” This inquiry represents an opportunity for the Commission to return to the correct definition of the word “broadband,” to wit, “The delivery of multiple, distinct signals and/or services over a single transmission medium such as coaxial or fiber optic cable, usually via frequency division multiplexing.” A local cable TV plant, which delivers video, telephony, and Internet services over the same cable but separated by frequency is an example of a “broadband” system. Note that the term “broadband,” properly used, does not imply that Internet is even among the services carried by the system, nor does it imply any specific performance level.

Furthermore, while it is certainly desirable for the Commission to define general performance categories for Internet service, confusion is assured if the Commission labels any particular performance level as “high speed.” Yesterday’s blazingly fast speeds are tomorrow’s unacceptably slow ones. The

² *Ibid*, p.2.

Commission should therefore describe connections not as “high speed” or “low speed” but in a way that reflects the actual number of bits transferred per second. (A useful convention might be to express the throughput as the base 10 logarithm of the number of bits transferred per second. A connection that delivered 1 megabit per second could thus be described as having “class 6” throughput.)

The Commission should also note that data throughput is not the only criterion that should be used to evaluate the quality of broadband service. Many users who switch to LARIAT’s terrestrial wireless broadband service do so not because throughput was slow but because the applications they wished to run (e.g. VoIP) could not tolerate the satellite system’s high latency. For a VoIP user, an online auction bidder, or a participant in an online game, a data throughput of 200 Kbps, with reliable latency to the backbone of 75 milliseconds or less, is actually far more desirable than a 5 Mbps satellite connection with an average latency of a third of a second and a jitter (variation in latency) of almost as much.

The Commission should recognize that many service providers make exaggerated speed claims, quoting the maximum raw bit rate of their equipment as the speed of the service. (This is tantamount to a used car salesman claiming that an automobile is a “120 MPH car” because this is the largest number on the speedometer.) Such claims, if they are not prohibited entirely as a deceptive marketing practice, should certainly not be honored when the actual performance of a connection is evaluated.

Finally, the Commission should allow the market, given full disclosure of the parameters of different services, to define acceptable service levels rather than attempting to dictate them. In rural areas where Internet backbone bandwidth is especially dear (our provider currently pays \$100 per Mbps per month at wholesale, and some of our colleagues pay as much as \$325 per Mbps), consumers will gladly opt for services which are not as fast as those available in the city but come with a price tag they can stomach (e.g. \$30 to \$50 per month). Such services should not be deprecated, or fail to receive support from government agencies, because they lack raw speed; they are delivering the maximum amount of throughput which is economically sustainable at the price the user is willing to pay.

3. BROADBAND DELIVERY VIA UNLICENSED AND “LIGHTLY LICENSED” SPECTRUM

Internet service providers which provide service via fixed, terrestrial wireless links – commonly called WISPs – have demonstrated that the services which they provide are perhaps the most cost-effective way of delivering high speed Internet service to unserved and underserved areas.³ At paragraph 21 *passim* of the *Notice*, the Commission notes that all WISPs, including LARIAT, make use of unlicensed spectrum to deliver broadband to consumers. While WISPs would prefer to use licensed spectrum, most cannot due to the current spectrum auction regime, which is slanted in virtually every respect against small operators. The current regime allows large carriers with vast capital reserves to bid up spectrum, foreclosing competition by preventing new entrants or worthy competitors from acquiring it.

Because the value to an incumbent of foreclosing competition is always greater than the potential return for a new competitive entrant, and because payments for spectrum are due upfront and in full very soon after the close of the auction (before a potential winner could possibly begin to make profitable use of the spectrum), few if any WISPs have been able to acquire exclusively licensed spectrum, even though they would likely be the most productive users of it. They are thus forced to make do with unlicensed spectrum, where – due to a lack of spectrum etiquettes – a single security camera or baby monitor too close to the access point can easily wipe out service to as much as 20 square miles.⁴

Absent a dramatic change in the way auctions are performed, the best results vis-a-vis wireless broadband deployment could be obtained via two enlightened actions on the part of the Commission. Firstly, the Commission should consider modifying Part 15 rules could be modified so that, in counties with populations of 200,000 or less, wireless broadband providers (but not other users of unlicensed spectrum) are allowed extra power to punch through the buzz of interference from consumer devices. An across-the-

³ For an article and map documenting WISPs' nationwide coverage, see <http://bennett.com/blog/2009/02/thought-you-had-no-alternatives-for-broadband/>

⁴ For a detailed study of interference on the 2.4 Ghz unlicensed band, see Wagstaff, A.J., Estimating the Utilization of Key Licence-Exempt Spectrum Bands,” Mass Consultants, Ltd. 2009, available for download at <http://www.ofcom.org.uk/research/technology/research/exempt/wifi/wfiutilisation.pdf>

board increase of 9 dB in the allowed power for both consumer premise equipment and the ISP access points to which they connect on the 900 MHz, 2.4 GHz, 5.7-5.8 GHz, and 60 GHz would approximately double the range of such systems in rural areas and (in the case of all but the last) make these overcrowded bands usable for broadband delivery once again in more densely populated ones. (Note that the 9 dB figure is not arbitrary, but reflects the capabilities of readily available equipment which could be pressed into service quickly.) A provision allowing the installation (by qualified installers only) of amplifiers with automatic gain control and bandpass filtering on existing equipment could accelerate the use of this additional power to reach currently unserved areas.

Another action which the FCC should take to facilitate the deployment of wireless broadband is to dedicate the AWS-3 microwave band – currently in limbo – as a “broadband stimulus band,” licensing it under a non-exclusive licensing regime similar to that used for 3650-3700 MHz.⁵ By requiring all equipment that uses the new band to conform to the recently developed 802.11y protocol, the Commission could ensure fair sharing of the spectrum and avoid the problems which have ensued in the lower half of the 3.65 GHz band due to the abandonment of a requirement for contention-based protocols.

The Commission should likewise make the upper half of the 3.65 GHz band available for use by equipment which conforms to the 802.11y protocol. While the large number of exclusion zones would limit this spectrum’s utility, even the smallest scrap of spectrum would be well used by WISPs, who are now being crowded out of the unlicensed bands by consumer devices.

4. OPENING INTERNET BACKBONES AND THE “MIDDLE MILE”

Any successful strategy for universal Internet access must provide not only for the “last mile” but for connection of the hub of each “last mile” network to the Internet backbone. Many providers, including

⁵ Use of the 3650-3700 MHz band has been extremely limited due to the large percentage of the US population covered by “exclusion zones.” Also, because no equipment has, to date, been approved for use on the upper half of the band, these 25 MHz of useful spectrum are currently sitting idle even in areas outside the exclusion zones, where they might be used to enhance broadband availability.

LARIAT, have had extreme difficulty obtaining reasonably priced Internet backbone bandwidth for their networks. LARIAT, as mentioned in its previous comments to the NTIA and RUS,⁶ has its network hub in a valley which is traversed by five nationwide “information superhighways” – fiber optic cable routes with tremendous capacity. However, due to refusal to deal by the owners of these backbones, LARIAT is forced to obtain transit to regional Internet hubs via the local ILEC. Alas, the ILEC, in a blatantly anticompetitive manner, charges more to deliver the bandwidth from a backbone provider in another city than the backbone provider charges for an equal amount of connectivity to the rest of the world.

In many cases, the “middle mile” problem has been exacerbated by concentration in the Internet backbone market. For example, three of the five backbones mentioned above are now owned by a single company – Level3 – which has repeatedly refused requests to open a point of presence in Laramie.

To remedy this and similar conditions, the Commission should again take up the long abandoned matter of “special access” (a misnomer, because in fact there is nothing “special” about it; it is simply wholesale “middle mile” access) and ensure that intracity transport is available to high speed Internet providers at reasonable prices. It should also incent – and, if incentives do not work, require – owners of nationwide Internet backbones to provide on-ramps in the areas through which their fiber passes.

5. FORBEARANCE FROM UNNECESSARY REGULATION

In paragraph 47 *passim* of the *Notice*, the Commission asks whether regulation is necessary to ensure sufficient “openness” in the Internet. While (as indicated just above) regulatory intervention is justified in instances of market failure or anticompetitive practices, regulation should be limited to such situations and should not be imposed when the creation of healthy competition would allow market forces to address any issue that might arise. Such is the case with so-called “network neutrality” regulation, which would impact small and competitive ISPs such as LARIAT far more than large incumbents, potentially destroying these alternative providers and eliminating competitive options for consumers. In LARIAT’s

⁶ See <http://www.brettglass.com/btop.pdf>

case, fear of capricious action by the Commission in the wake of the Comcast Order⁷ has driven away potential investors and created great uncertainty as to what network management practices, if any, can be used to control costs – especially given the high prices, mentioned above, which LARIAT must pay for Internet bandwidth. LARIAT therefore respectfully requests that the Commission always seek to solve such controversies by first incenting and stimulating competition, and intervene further only when such efforts are unsuccessful and there is clear evidence of anticompetitive behavior and/or market failure. LARIAT further requests that any regulation of network management practices be accomplished via due process – rulemakings subject to public comment and discussion – rather than “case by case” adjudicatory actions, so that it is clear to all, in advance, what the rules actually are.

Respectfully submitted,

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⁷ See *Formal Complaint of Free Press and Public Knowledge Against Comcast Corporation for Secretly Degrading Peer-to-Peer Applications; Broadband Industry Practices; Petition of Free Press et al. for Declaratory Ruling that Degrading an Internet Application Violates the FCC’s Internet Policy Statement and Does Not Meet an Exception for “Reasonable Network Management,”* File No. EB-08-IH-1518, WC Docket No. 07-52, *Memorandum Opinion and Order*, 23 FCC Rcd 13028 (2008) (Comcast Order) pet. for review pending, *Comcast Corporation v. FCC*, No. 08-1291 (D.C. Cir. Sept. 4, 2008)