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To: FCC
Subject: Reply Comments —NBP Public Notice #30
Reference: GN Docket Nos. 09-47, 09-51, 09-137

The topics covered in this response include:
1. Rural America vs. Urban America
2. Wireless vs. Wireline services
3. Cost for deploying Universal Advanced Broadband

The most recent views I have seen from the FCC were presented on January 6th, when Chairman Genachowski spoke at GigaOM. During this interview, Chairman Genachowski responded to several questions of concern:

In discussing the challenges with deploying broadband across America, the Chairman stated that a) we need our major urban areas to have speeds that are the fastest in the universe, and b) we need our most remote remote rural areas to have the best possible speeds we can get to them under the most creative policies we can muster.

This seems to imply that either rural America has less critical or less important needs for broadband, or that it is acceptable to provide degraded service to rural America because it costs too much.

I hope that I misunderstood the Chairman's statements. This is essentially the situation we have today and it is not working. Companies are rolling out fiber in major cities where it is profitable. Most rural areas have to select from a variety of limited, slow, expensive, internet services. The only two universal choices are dial-up and satellite. Neither of these solutions can provide even a minimally acceptable broadband experience. In today's world of rich media content, dial-up and satellite services take 20-30 seconds to load a single web page. Neither can support applications like telepresence or telemedicine, which ironically are even more valuable and important for rural areas than they are for urban areas. Next generation satellite systems will increase available bandwidths, but they cannot solve the latency issue which is a show stopper for many applications.

During the same interview, the Chairman also stated that there are very important unanswered questions about whether a rolled out 4G network can be a meaningful competitor to wired broadband providers. Without hearing which questions the Chairman was referring to it may be unfair to criticize this statement. Nonetheless, this statement appears inconsistent with statements by all of the industry experts I have heard and spoken with. Even developers and promoters of WiMAX and LTE acknowledge that these wireless networks can really only deliver less than 10Mbps sustained levels of broadband download service to an active base of subscribers under load (more typically 4-5Mbps). This data point was included in the September Commission Meeting and the US Broadband Coalition report, dated September 24, 2009.

Although wireless speeds may range "up to" 100Mbps, the high infrastructure cost leads to high subscriber counts on each beam, which significantly reduces the bandwidth available to individual subscribers under loaded conditions. There are also many rural areas with significant hills and valleys that preclude coverage by even aggressive tower placement. Additionally, the bandwidth reduces significantly with distance – another serious issue for rural areas. Wireless solutions are critical, and they play an important role in the communication ecosystem. However, they cannot deliver meaningful broadband to rural homes. This view was also confirmed in a conversation with Carlos Kirjner, who spoke at the Churchill Club in December 2009.

Given such constraints, how do we deliver meaningful universal broadband across America? Setting aside cost, every expert seems to agree that fiber is the only solution that can deliver true advanced broadband today and for decades to come. At GigaOM, Chairman Genachowski stated that our electric grid and telephone systems have endured decades of growth. We need to think in similar terms when we roll out universal broadband. Otherwise we will continue to roll out

new technologies several times each decade. This will increase costs and slow down availability of advanced universal broadband deployment.

The Chairman also referred to the challenge that broadband isn't as cleanly a binary decision as was electricity and telephone – either you have it or you don't. In reality, fiber is the "electricity of the 21st century". Experts agree that fiber can deliver an ever increasing level of bandwidth through upgrades to the electronics without rolling out new fiber. No other technology holds such promise. The only issue seems to be that of cost. It's a difficult issue, but one that we need to address. Our world competitors are already doing this and have set the bar. In this context, fiber really is a binary solution to advanced broadband – either you have it or you don't. With fiber you can run the next generation of high demand applications such as telepresence, telemedicine, HD IPTV, Educational Services, etc. Without it, you cannot. The FCC September Commission Meeting and the US Broadband Coalition report, dated September 24, 2009, included data that validates this perspective.

So how do we get there? The FCC September Commission Meeting pegged the incremental cost of providing universal availability of fiber at 350B$. This seems to have become a fundamental assumption and a reason why we can't afford to strive for this goal. I'd like to challenge this assumption from several perspectives, and suggest several options.

1. The Bill & Melinda Gates Foundation submitted a proposal to the FCC in September 2009, estimating the cost of deploying fiber to all anchor community institutions at 5-10B$. This estimate was confirmed by NATOA in October, 2009. This proposal would not cover all homes, but it would bring fiber to each community and provide an excellent starting point. This seems to be a no-brainer, and should be done quickly for many reasons:

a. The cost is quite reasonable and can probably be covered through a combination of public and private investment.
b. Deploying fiber to anchor institutions can replace the antiquated e-rate program, which is both expensive and limited in its ability to serve the broadband needs to schools and institutions. As an example, a school near where I live currently has 8 T-1 circuits to support their broadband needs!
c. Doing this quickly will provide new jobs and opportunities for businesses installing fiber to these institutions.
d. Advanced broadband in schools will enhance our ability to promote science and engineering in education.
e. If it is done properly, it will expand our fiber network into many unserved/underserved communities as well as meeting the needs of wireless growth. Carriers agree that fiber is critical for wireless and wireline backhaul services. As cell sizes shrink this will become even more of a problem. We need fiber across America regardless.
f. This expanded fiber network can serve as a basis for broader deployment of fiber to homes.
g. This investment will last for decades, given the "future proof" nature of fiber.
h. Providing advanced broadband to these institutions will accelerate the opportunity and demand for high performance computing systems, thus providing additional opportunities for business growth.

2. Our fiber backbone must be open in order to stimulate growth and opportunities. Once anchor institutions have advanced broadband, the next step will be to extend advanced broadband throughout local communities. Municipalities, cooperatives, and small businesses will need open and fair access to this fiber, otherwise deployment will stall. The FCC needs to ensure that our fiber backbone is managed as the critical national resource that it is. Just like the electric grid and highway system, the nation depends on the fiber backbone. It cannot be held hostage to the self-interests of any group or set of companies. It needs to be either regulated and/or managed by organizations with the public interest as a primary priority.

3. The FCC has not stated how it derived the 350B$ price tag. As such it is hard to break this down and analyze underlying assumptions. Let's assume this price tag is valid. At first blush this cost appears quite daunting. However, let's put it into perspective:
a. The cost would not be incurred at one time – it would be spread out over ~10 years.
b. The telecommunications industry is very large – producing over 1T$ in revenue per year according to TIA.
c. Telecom companies are rolling out fiber in urban areas where the ROI is high. Dense areas will thus be covered through the normal market process.

Thus the challenge is to cover rural areas where lower densities do not produce a high ROI. This is very similar to the challenges the country faced with electrification and wired telephone service. We need the right combination of incentives and regulations to promote the rollout of universal fiber. It is the only known technology that is future proof

and that will endure the tremendous and unpredictable growth of the nation's broadband needs. Nonetheless, assuming 50% of American homes fall below the self-funded ROI criteria for telecom companies, cooperative and municipalities, the cost for universal coverage would be on the order of 15B$/year – a much more manageable number. The government is already spending 7B$+ to subsidize broadband programs.

Several potential ways to get there:

1) Telecom companies want spectrum. The FCC can require universal fiber coverage on a territory basis in return for spectrum, fees, and exclusive fiber coverage to homes for a fixed period of time.
2) Some telecom companies have both wireline and wireless services. Allow companies that do not, or who do not want to deploy fiber to buy/sell/exchange "fiber commitments/rights" to other companies that do.
3) This process could be managed in a manner similar to the "cap and trade" approach for emissions.
4) Similarly, Telcos want to drop support for PSTN. The FCC could allow this in exchange for full fiber coverage, with adequate overlap to ensure no gaps in coverage.
5) Make it feasible for cooperatives and/or homeowners to buy and own fiber rights to their homes. The fiber backbone should be open, but connections to the home could be considered an asset that can be bought and sold.
6) Level the playing field for cooperatives and municipalities to offer fiber service to homes. This means ensuring that access rights and rights of way are open and fairly priced.
7) Restrict government funded broadband incentives (grants/loans) to fiber. Wireless, satellite, and other technologies should not receive public funding. If companies want to deploy non-fiber solutions that's fine, but those solutions should not be subsidized. The long term priority should be for universal fiber, and those programs should be encouraged and subsidized.
8) Publicize the FCC's 350B$ price tag analysis so that experts can further analyze the issues and propose solutions.

Summary:

We need to look beyond a "one size fit's all" approach to achieving universal broadband across the USA. Carriers are likely to compete effectively in urban and suburban areas. Higher density rural areas need help, but the cost to deploy fiber is reasonable, is a good investment, and will provide jobs and economic growth. Low density rural areas, which account for about 9% of the households, are the hardest areas to cover. Accelerating deployment of fiber to anchor institutions, as recommended by the Bill & Melinda Gates Foundation is a great first step. By the time that work is complete, refined techniques and innovation from deploying higher density rural areas may well provide additional solutions and cost savings. Coops, government grants, and alternative ownership models should also be explored.

Our fiber backbone must be open in order to stimulate growth and opportunities. There are also a variety of ways to encourage and enforce deployment of universal fiber deployment. A number of ideas are listed above.

Such a tiered approach would help manage cost, encourage market forces and innovation, and move the USA forward in reaching a competitive broadband position among leading nations. We are already spending 1T$ annually for telecommunications. A chunk of the cost of deploying advanced broadband universal service may need to be subsidized, but much of it could be absorbed as a part of consumer demand and economic growth.

FCC commissioners, our future success is at stake. We need bold action similar to the steps taken to develop our National Highway System and our electric grid. We also need to manage our fiber backbone as a national resource. Please ensure that the USA regains its competitive position through targeted incentives, funding, and regulations that focus on and accelerate universal fiber deployment across the USA.

Respectfully,

Craig Chatterton