COMMENTS OF RICH GREENFIELD
ON COST ESTIMATES FOR CONNECTING ANCHOR INSTITUTIONS TO FIBER

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The Gates Foundation is to be congratulated in bringing about this Public Notice on connecting anchor institutions to fiber, an admirable public policy goal but one that must not be evaluated in isolation without consideration of competing priorities. Unlike the Stimulus Act itself, with its technology neutral approach and its emphasis on meeting the needs of the unserved and underserved, the Foundation's cost estimates and the related SHLB Coalition initiative promote the idea that selected core anchor institutions – schools, libraries and health care centers – should receive additional broadband deployment dollars for fiber and fiber alone, in addition to the almost $30 billion which has been spent bringing greater Internet connectivity to the very same institutions for more than a decade.

Unfortunately, there is little in the Foundation's cost estimates document with which someone from a rural state could agree, or even which any state with significant rural areas might support. The Foundation's definition of "all" excludes in a footnote those rural institutions for which trenching and aerial deployment of fiber is cost-prohibitive. One must ask: what ever happened to the ARRA's emphasis on the unserved and underserved?

The Gates Foundations cost estimates necessarily lack clarity because a great deal of required data is missing, unanalyzed, and, perhaps, ultimately unavailable. Most notably absent are any FCC definitions of "community" and "anchor institutions," not to mention any distinctions to be made between anchor institutions, community anchor institutions, and public anchor institutions. Without a commonly agreed upon definition of anchor institutions, there can be no accurate count of the number of such institutions, nor of the number of communities which have anchor institutions in the various categories contained in the definition. And without a definition of "community" it is not possible to determine the number of communities in the United States, nor the number of communities which lack different categories of anchor institutions, not to mention those which may lack any anchor institutions.

There seems to be no awareness in most of the FCC's broadband proceedings of Census Designated Places (CDPs), unincorporated places without municipal governments, of which there are probably around 5,000, in addition to the 25,000 or so incorporated places in the U.S. In 1990, some 29 million people – more than 10% of the national population – lived in CDPs. This is the heartland of the unserved and underserved, unincorporated communities without municipal services *and often without any anchor institutions*. Without a tax structure, it is hard if not impossible to maintain anchor institutions. Both the Gates Foundation's cost estimates and the SHLB Coalition proposal promoted by Senator Kerry, among others, seem to conflate communities with anchor institutions, as if there are no communities without anchor institutions, which is not true unless communities without anchor institutions are to be relegated to the status of mere "places."

The distribution of anchor institutions varies widely across the United States. Only half of US "places" have public libraries. Do not confuse a public library with its service area, where patrons must drive from another community for service or else be served by bookmobile. ALA may argue that every US community *is served* by a library, but with only some 16,000 or so libraries

(including branches and outlets) and 30,000 or so communities (incorporated and CDPs), it is clear that only every other community actually has a *local library*. While there are almost 400 communities in Alaska and only 100 Alaska libraries (115 when library branches are counted.) In contrast, almost every Alaska community has a RHC center, but that bandwidth is not multi-purpose and is not accessible to the community at large. In other states, however, there may hundreds communities without rural health care centers. It varies widely from state-to-state and according to the health of local economies..

While no doubt unintentional, the omission of the CDPs results in a sleight of mind which first leads the reader to think that all anchor institutions will be connected to fiber for the estimated XX billions of dollars, when in reality only the selected anchor institutions (schools, libraries and health care centers) will be connected; then, the reader is led to think that all communities have anchor institutions, when the figure is probably much closer to 50% for libraries, 90% for schools and health centers; and, finally, the reader is led to believe that all anchor institutions can actually be connected by fiber, when the figure is probably closer to 90% due to geographical, environmental, and legal obstacles. This is all before tackling the issue of what is actually "cost prohibitive." Giving priority to connecting anchor institutions with fiber is as much a policy of exclusion as inclusion which will have a disparate perhaps devastating impact on the unserved and underserved if their needs are not given similar priority.

While many of the Commission's questions concerning the Gates Foundation's cost estimates cannot be answered without access to proprietary and confidential information held by the telecommunications industry, here are some limited comments based on experience and publicly available information.

1. Are there other categories of buildings that should be considered anchor institutions?

This is simply a restatement of the question asked in the NTIA, USDA RUS Joint Request for Information back in April 2009: *"Are there other terms in this section of the Recovery Act, such as "community anchor institutions," that NTIA should define to ensure the success of the grant program?"*

Apparently, NTIA has yet to define the term, which is a prerequisite to establishing what categories of buildings should be considered as anchor institutions. And before defining "anchor institution," the word community must be defined. So repeated below is my response to the earlier questions:

> ***"If so, what are those terms and how should those terms be defined, given the stated purposes of the Recovery Act?***
> At the broadest level, a "community anchor institution" in the context of ARRA could be any organization that offers free or low-priced broadband access and ICT training and assistance on a continuing basis. The problem with such a definition is that very few institutions, even among those currently listed in the statute, actually do serve the entire public at large rather than a defined subset, often created by means of a business relationship requiring membership and /or a payment of some kind. (The major institutional exception to this is public libraries, where membership is generally defined geographically, and most

payment is indirect via local taxes, but tourists from anywhere are generally served, the exception being the borrowing of materials, though this too is occasionally allowed with a covering deposit.)

Even if it is possible to draw a hard line between "public" and "private" organizations, as long as private organizations are willing to provide broadband and ICT services to the general public they should not be excluded. In fact, most community colleges, like K-12 and higher education institutions, serve relatively defined clienteles which pay directly or through taxes for their services. Besides libraries, communities colleges, and other institutions mentioned in the act, senior centers; youth centers, e.g., YMCAs; tribal centers and other organizations with public service programs (e.g., unions, farmer associations, broadband providers, etc.) should be added to the list, which should remain flexible and open to even further additions. The important distinction is between profit-making and non-profit operations. As long as the organization is operating the broadband program as a non-profit endeavor, as determined through the individual grant proposals, then it should be an eligible community anchor institution for broadband education, access or deployment.

In unserved and underserved areas, where there is never a public library in every community, the anchor institution might turn out to be the local computer store, or even the local cable company or telco, whether ILEC or CLEC."

Additional candidates for anchor institution status might include the following:

Community stores (single, all-purpose stores that serve as gathering points)
Fire Stations
Police Stations
Post Offices
Tribal Offices

The other important distinction between anchor institutions is whether they are "public" or not. Libraries are public in the absolute sense of serving the general public in a given community; schools, however, are public in a more limited sense, i.e., they serve children and their parents, but not adults in general. Health care facilities are public as well, but are defined narrowly in terms of their functions. Thus, schools and health care facilities do not provide public broadband access, nor do they teach ICT skills, but rather use broadband access on behalf of their specific clienteles, namely children and the sick. The majority of public anchor institutions does not directly facilitate broadband deployment in terms of increasing awareness and demand, but rather facilitates residential deployment indirectly by strengthening the business case for bringing broadband to the community in the first place.

2. How well do the four categories of population density (dense urban, urban, suburban and rural) segment anchor institutions?

Not well at all. They ignore and obscure the digital divide that exists between the unserved and underserved population segments that exist in all four proposed categories, though probably most seriously in the urban and rural categories.

Is there need to further divide, for example, the rural grouping (<1,000 persons per square mile) to treat more remote areas differently?

While population dispersal is an important metric in broadband deployment planning, more important is recognition of the special needs and requirements of small communities, defined as those less than 2,000 in population which have underperforming economies incapable of supporting broadband deployment or services without some form of subsidy or concomitant efforts to jump-start their economies. Though largely rural and remote, these communities may also be found in urban areas as ethnically or racially segregated populations having serious levels of poverty and un- or under- employment. The national broadband plan should address these communities as a separate category with special problems and needs and may find the Census Bureau's Census Designated Place designation useful in this regard.

3. How accurate is the assumption that 80% of anchor institutions lack fiber?

Apart from the Gates Foundation's Broadband Assessment of Public Libraries, completed in early 2009, which is probably highly accurate, these figures are largely "guesstimates." The necessary data exists but it hasn't been analyzed even though most of it is probably available through public documents associated with the Rural Health Care and Schools and Libraries USF programs.

Does it vary across the different population-density groups? Yes.

Does it vary by type of anchor institution? Yes.

4. To what extent are the cost estimates for bringing fiber to individual buildings accurate?

> **a. Are the average loop lengths a reasonable representation of the distance to currently available fiber access points for each density group?** No. They are just another guess. Only telecom service providers can give accurate average loop length averages and only for their own territories.
>
> **b. Are the costs for aerial and trenched deployment representative**? Probably not since it is doubtful they contain high cost area costs or deployment costs where there is no pre-existing history of wireline deployment of any type..
>
> **c. Is the ratio of trenched to aerial deployment in the high-end cost estimate reasonable for urban and suburban areas?** These figures may be more accurate than many of the others.
>
> **d. To what extent will aerial plant be available in urban and suburban areas? To what extent will it be possible to add fiber to existing utility conduits or make use of dark fiber, thereby reducing trenching costs, in urban and suburban areas?** While this data may be available at a very granular level, no one has taken the time to dig it out and aggregate it. The largest telcos may have a good estimate based on past

experience and knowledge of their own network deployments but they consider this proprietary information.

e. Is it reasonable to assume all-aerial installation in rural areas? No. Overall terrain and weather features, including mountains, rivers, glaciers, tundra, etc. may prohibit all-aerial installation.

Is the assumption about requiring 30% new poles accurate? Is the $2-4 per foot cost reflective of the cost of these new poles? Pole prices depend on the type of pole and the quantity purchased. . These prices seem somewhat low but might be achieved for wooden poles in bulk. In addition, the cost of a pole needs to take the pole's entire life cycle into account..

http://www.wwpinstitute.org/pdffiles/CAissues/MATERIALCOSTfinal.pdf
http://www.enviroliteracy.org/article.php/1311.html

f. Is the termination cost per building accurate? Is it reflective of both equipment of sufficient capacity and of the labor required to install it?

5. What incremental inside-wiring, or campus-wiring, costs should be added to these estimates? This would depend on the nature of the anchor institution.
For what type of institutions in what geographies? This is too complex to answer in a short space and goes to t he issue of operating costs below, i.e., its not just about upgrading wiring, but paying for electricity on a continuing basis.

6. To what extent will right-of-way issues lead to incremental costs not reflected in these estimates? How will right-of-way issues impact the timeline of build-out to these institutions? They will slow deployment by several years.

7. Should operating expenses be a consideration when calculating cost for connecting anchor institutions to fiber? Yes. In the present recession, anchor institutions are under great fiscal stress and are often the first institutions to be affected in community budget cuts. For example, libraries are being closed or having their hours cut back; police sub-stations and fire stations are closing or having personnel cut. Without operational support, deployment of fiber to anchor institutions will just be another unfunded mandate and could result in massive amounts of "stranded" last mile fiber..

What operating expenses would be associated with running these networks, and how would those vary by type of institution and geography? This all depends on who owns and operates the resulting networks. Few if any anchor institutions have the deployment and operation of broadband networks as part of their mission statement. Rather, broadband networks are used indirectly to better meet mission-critical goals. For example, schools for the most part have skeletal IT staffs for on-site network maintenance and liaison with one or more telecommunication companies to which required telecommunication services have been outsourced by the school on a district-wide basis. E-Rate has indirectly weakened school district IT staff and expertise because it has encouraged more turn-key outsourcing operations. Public libraries may piggy-back off of a municipal broadband network in larger urban areas or even a school district network in rural areas, particularly when the school library has a combined public library function.

If anchor institutions move directly to fiber broadband and advanced networking, their existing IT infrastructure and support services may be unable to make immediate use of the greater connectivity absent additional training, hardware and software upgrades, etc. The traditional E-Rate program has taken a more measured course in requiring multi-year technology plans from program participants that include adequate funding for equipment and training so that increased connectivity is fully utilized. There seems to be no similar requirement attached to this fiber proposal yet even though the leap to fiber will be much more difficult and expensive to absorb than the more gradual approach advanced in the E-Rate program.

8. To what extent will providing fiber to these institutions improve the build-out economics in currently un- or under-served areas?

This is an important question which does not have an easy or clear answer, one which could only be given with any assurance after an analysis of E-Rate and RHC program-generated data. In smaller communities and CDPs, there is less of a direct correlation because the existence of heavily subsidized broadband in schools and health care centers frequently has little effect on the deployment of affordable broadband throughout the community at large simply because residents cannot afford broadband that is not subsidized. This is particularly true in communities served by satellite and is probably less true in the case of fiber deployments. What results in these communities is islands of connectivity, i.e., stove-piped, special use networks.

One can argue that the primary goal of E-Rate has been to increase connectivity and not necessarily promote fiber deployment, but at least some analysis of a decade of Priority 1 and 2 expenditures could be made to determine with some degree of accuracy the impact this large, long-term investment has had on fiber deployment to anchor institutions. If there has been a problem, perhaps it has been the bottom-up approach that E-Rate has taken where each school district and library must first recognize the need for fiber in order to scale its broadband into the future. And perhaps those who have recognized the need don't have the necessary local match and cannot rely on Priority 2 to get the additional internal connections equipment that may be needed for fiber connections. But there is no assurance that a top-down approach as embraced by the Gates Foundation and the SHLB will have better results just because, at this point, there is no match requirement attached to the proposed program. The real problems in the anchor institution approach lie elsewhere

9. To what extent will providing fiber to these institutions directly assist last-mile build-outs in currently un- or under-served areas?

This is the $64 million question. Based on Alaska's experiences with E-Rate and RHC subsidies for bandwidth, there is very little evidence to show that residential broadband will rapidly follow upon anchor institution Internet or broadband deployment. On the contrary there is considerable evidence that deployment to schools and rural health care centers has created digital divides within dozens of communities because residential broadband, if made available at all, is still largely unaffordable.

Is the push by the Gates Foundation and the SHLB Coalition to connect anchor institutions first so they can promote broadband adoption in their communities a good shortcut to national broadband deployment, or will it actually serve to slow-down national broadband deployment?

There must first be a general recognition that not all anchor institutions are equal: some (e.g., libraries) have a general public service obligation *but most do not*. Subsidized bandwidth to schools and rural health care centers is currently restricted ("stove-piped") by program rules and regulations. These institutions would have to change their missions if they are to serve their local communities as training centers for sustainable broadband adoption. In Alaska at least, schools and rural health care centers have more often than not created digital divides *between* the rural anchor institutions and their communities. At great expense we have overbuilt many rural areas with limited-use bandwidth networks, satellite and microwave networks of various kinds, but also fiber networks, without making higher broadband speeds affordable to these communities at "comparable and reasonable" rates as required in the 1996 Telcom Act. Other rural communities, the smallest ones – especially those without public libraries - are not being connected at all.

Without a change in program rules allowing for aggregating community bandwidth demand, pumping more funding to schools, rural health care centers and other specialty anchor institutions will only deepen the existing digital divides, particularly in those unserved and underserved areas which are lucky enough to have eligible anchor institutions. As it is, the subsidized broadband made available to schools and rural health centers sits largely unused after office hours due to FCC regulations, leaving their communities without any public broadband access.

For example, will bringing fiber to local schools generally provide shorter loop lengths to surrounding homes, or is the location of the communications plant relative to the school and community the primary driver?

How will that vary by population density? Without a continuing operational subsidy, fiber deployment to anchor institutions in regions with widely dispersed populations in small pockets and clusters will not be sustainable and will not lead to residential deployment.

CONCLUSIONS AND RECOMMENDATIONS

When one adds RHC funding, including the Pilot Project, to E-Rate, it would seem to make more sense to consider reforming these two existing USF programs so as to accelerate fiber deployment rather than create an additional, 1-time program, especially since the only anchor institutions mentioned in the Gates proposal are the three specifically covered already by these two programs, i.e., schools, libraries and rural health care centers.

There is something fundamentally incomplete in a proposal which suggests that installing fiber to "all" anchor community institutions may cost $5-$10 billion without any reference to the almost $30 billion that has already been committed in the last 12 years to increasing and maintaining connectivity to schools, libraries and health care centers. And yet the Foundation "assumes" that 80% of these anchor institutions are still without

fiber. At this point, shouldn't we know exactly how many anchor institutions are connected to fiber before proceeding?

Instead of simply arguing that deployment to anchor institutions is a shortcut to national broadband deployment, there should be an effort to identify - out of the 30,000 or so places in the United States – those which have no anchor institutions, most probably the smallest and poorest of communities., i.e., the unserved and underserved. How are these communities to be accommodated? Are they simply redlined out when deployment priority is given to anchor institutions? Should the commentators in this limited docket be deciding what is "cost prohibitive" and what is not, particularly if that judgment consigns rural anchor institutions to second-class broadband speeds as the Gates Foundation seems to be recommending? Isn't this rather a national decision, to be made only after an open debate on the meaning of universal service?

It may well be that fiber is not an appropriate technology for many rural areas and is truly cost-prohibitive in some cases, but that is not an administrative decision or even an assumption to be made unilaterally by any one organization, group, or docket at this stage in a national planning process, before completion of a national broadband map and an analysis of the associated data. If rural residents are to be permanently consigned to second-class broadband status that decision should be taken only after common deployment problems associated with each technology have been identified and experts have reached a broad consensus on how long it may take to solve these problems - if they can be solved at all - as well as on the establishment of the research agendas and funding for the necessary breakthroughs to be made .

A <u>balanced approach</u> to a national broadband plan would ensure that in addition to special funding for fiber connectivity and advanced networks to existing anchor institutions, that an equivalent emphasis and expenditure be made to bring a basic broadband threshold to the unserved and underserved by means of national broadband satellite coverage at affordable prices. When it comes to expertise, one must also ask oneself where are the FCCs network engineers and satellite specialists? Where are its experts in rural broadband deployment? They seemed to be absent in the mid-term review.

The impression given by this docket is that the National Broadband Plan may looking for an easy out when it comes to the really difficult and expensive-to-solve problems of the unserved and underserved by instead concentrating on the obvious and popular choice of a "fiber fix" first. There may be little wrong with this approach as the first act in a national broadband deployment play, but what comes next? What will the FCC's Act 2 be? Or will the unserved and underserved still be left standing in line when the play lets (and the money runs) out?

Even though there has been little if any discussion of maintaining or revising the National Broadband Plan in the future, it must not be a one-off event but rather it must be continuously revised and improved. Otherwise, trickle-down broadband would seem to be the permanent fate of the unserved and underserved.

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