



PUBLIC NOTICE

Federal Communications Commission
445 12th St., S.W.
Washington, D.C. 20554

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COMMENT SOUGHT ON COST ESTIMATES FOR CONNECTING ANCHOR INSTITUTIONS TO FIBER NBP Public Notice #12

PLEADING CYCLE ESTABLISHED

GN Docket Nos. 09-47, 09-51, 09-137

Comment Date: October 28, 2009

In developing a National Broadband Plan, the Commission is relying on a variety of data to fully evaluate the costs of deploying broadband infrastructure throughout America.¹ On October 5, 2009, the Bill and Melinda Gates Foundation filed a cost model and cost estimates of providing fiber optic connectivity to anchor institutions, such as public schools and libraries, community colleges, and hospitals.² The Gates Foundation cost model is attached to this Public Notice as Appendix A. Below, we seek input on targeted questions related to the cost estimates and models set forth in this filing.

1. Are there other categories of buildings that should be considered anchor institutions?
2. How well do the four categories of population density (dense urban, urban, suburban and rural) segment anchor institutions? Is there need to further divide, for example, the rural grouping (<1,000 persons per square mile) to treat more remote areas differently?
3. How accurate is the assumption that 80% of anchor institutions lack fiber? Does it vary across the different population-density groups? Does it vary by type of anchor institution?
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?
 - b. Are the costs for aerial and trenched deployment representative?
 - c. Is the ratio of trenched to aerial deployment in the high-end cost estimate reasonable for urban and suburban areas?
 - 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

¹ See FCC, Presentation for the September 29, 2009 Commission meeting, 44-45 (Sept. 29, 2009), http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-293742A1.pdf.

² Letter from Jill Nishi, Deputy Director – U.S. Libraries, Bill & Melinda Gates Foundation, to Marlene Dortch, Secretary, FCC, GN Docket No. 09-51 (Oct. 5, 2009), http://fjallfoss.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=7020040706.

trenching costs, in urban and suburban areas?

- e. Is it reasonable to assume all-aerial installation in rural areas? Is the assumption about requiring 30% new poles accurate? Is the \$2-4 per foot cost reflective of the cost of these new poles?
 - 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? For what type of institutions in what geographies?
 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?
 7. Should operating expenses be a consideration when calculating cost for connecting anchor institutions to fiber? What operating expenses would be associated with running these networks, and how would those vary by type of institution and geography?
 8. To what extent will providing fiber to these institutions improve the build-out economics in currently un- or under-served areas?
 9. To what extent will providing fiber to these institutions directly assist last-mile build-outs in currently un- or under-served areas? 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?

All comments should refer to GN Docket Nos. 09-47, 09-51, and 09-137. Please title comments responsive to this Notice as “Comments or Reply Comments—NBP Public Notice # 12.” Further, we strongly encourage parties to develop responses to this Notice that adhere to the organization and structure of the questions in this Notice. Interested parties may file comments on this Notice on or before October 28, 2009.

Comments may be filed using (1) the Commission’s Electronic Comment Filing System (ECFS), (2) the Federal Government’s eRulemaking Portal, or (3) by filing paper copies.³ Comments filed through the ECFS can be sent as an electronic file via the Internet to <http://www.fcc.gov/cgb/ecfs/> or the Federal eRulemaking Portal: <http://www.regulations.gov>.⁴ Generally, only one copy of an electronic submission must be filed. In completing the transmittal screen, commenters should include their full name, U.S. Postal Service mailing address, and the applicable docket or rulemaking number. Parties may also submit an electronic comment by Internet e-mail. To get filing instructions for e-mail comments, commenters should send an e-mail to ecfs@fcc.gov, and should include the following words in the body of the message, “get form.” A sample form and directions will be sent in reply. Parties who choose to file by paper must file an original and four copies of each filing.

Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail (although we continue to experience delays in receiving U.S. Postal Service mail). All filings must be addressed to the Commission’s Secretary, Office of the Secretary, Federal Communications Commission.

³ See Electronic Filing of Documents in Rulemaking Proceedings, 63 Fed. Reg. 24121 (1998).

⁴ Filers should follow the instructions provided on the Federal eRulemaking Portal website for submitting comments.

- The Commission's contractor will receive hand-delivered or messenger-delivered paper filings for the Commission's Secretary at 236 Massachusetts Avenue, N.E., Suite 110, Washington, D.C. 20002. The filing hours at this location are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes must be disposed of before entering the building.
- Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.
- U.S. Postal Service first-class mail, Express Mail, and Priority Mail should be addressed to 445 12th Street, S.W., Washington, D.C. 20554.

People with Disabilities: To request materials in accessible formats for people with disabilities (Braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer and Governmental Affairs Bureau at (202) 418-0530, (202) 418-0432 (TTY).

For further information about this Public Notice, please contact Randy Clarke at (202) 418-1500.

-FCC-

APPENDIX A:

Gates Foundation Cost Model

Filed With The Federal Communications Commission October 5, 2009 in GN Docket 09-51.

BILL & MELINDA
GATES *foundation*

October 5, 2009

Ms. Marlene H. Dortch
Federal Communications Commission
The Portals, TW-A325
445 12th Street SW
Washington, DC 20554

**Re: Notice of *Ex Parte* Presentation – GN Docket 09-51,
*A National Broadband Plan for Our Future***

Dear Ms. Dortch:

In accordance with Section 1.1206(b) of the Commission's rules, we hereby provide notice that on Thursday, October 1, 2009, I met by phone, and John Windhausen, Coordinator of the Schools, Health and Libraries Broadband Coalition met in person, with Blair Levin, Executive Director of the Commission's Omnibus Broadband Initiative ("OBI"), Dr. Carlos Kirjner, Senior Advisor to the Chairman on Broadband, and Steven Rosenberg, Infrastructure Manager in the Office of Strategic Planning and Policy. We distributed and discussed the attached cost model that estimates the costs of providing fiber optic connectivity to anchor institutions. Please feel free to contact me with any further questions.

Respectfully,



Jill Nishi
Deputy Director – U.S. Libraries
Bill & Melinda Gates Foundation

Cc.:
Blair Levin (Blair.Levin@fcc.gov)
Dr. Carlos Kirjner (Carlos.Kirjner@fcc.gov)
Steven Rosenberg (steven.rosenberg@fcc.gov)

Preliminary Cost Estimates on Connecting Anchor Institutions to Fiber
September 25, 2009

BILL & MELINDA
GATES *foundation*

PRELIMINARY COST ESTIMATES

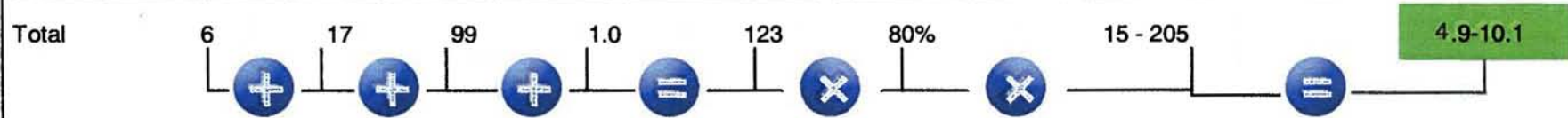
Notes on Analysis

- The attached analysis provides a preliminary cost estimate for providing fiber optic connectivity to anchor community institutions—specifically, public schools, public libraries, hospitals and community colleges. These estimates, based on data currently available to the public, are not definitive. In submitting this analysis, we seek to assist federal agencies in their efforts to deploy broadband technologies more broadly and to encourage others with greater expertise in this area to come forward with additional data and information that can be used to improve upon this preliminary assessment.
- Estimates in this document are for transport only networking and are exclusive of costs associated with network management and network intelligence.
- Estimates are for last mile fiber costs to community institutions. No estimates of non-last mile or backhaul capacity requirements were made.
- This analysis is limited to the cost of installing fiber connections and does not assess the cost of other non-fiber technology alternatives (e.g. MSO coax, FTTN or wireless technologies).
- Finally, this analysis does not include site-specific estimates for any given region or a detailed understanding of network topology to create a more accurate bottoms-up estimate.

PRELIMINARY COST ESTIMATES

Installing fiber to all anchor community institutions may cost \$5-10 billion, with range driven by unknown site-specific factors in fiber deployment costs

Population density ¹	Thousands of locations						\$ Thousands		\$ Billions	
	Hospitals	Public libraries	Public schools (K-12)	Community colleges	Total institutions	Institutions assumed w/out fiber ⁴	Low-end fiber cost per site ²	High-end fiber cost per site ²	Low-end total fiber cost ⁴	High-end total fiber cost ⁴
Dense Urban	0	1	5	0	6	80%	15	65	0.1	0.3
Urban	1	2	13	0.1	16	80%	15	65	0.2	0.9
Suburban	1	6	24	0.4	31	80%	35	205	0.9	5.2
Rural	4	8	57	0.4	69	80%	65	65 ³	3.7	3.7



1 Determined by zip code population density: Rural: <1,000 persons per square mile, Suburban: between 1,000 and 4,000, Urban: between 4,000 and 10,000, and Dense Urban: >10,000. Some locations (305 hospitals and 446 libraries) did not match zip codes in the most recent GIS database, and have been assumed to have the same distribution as the other locations

2 Low-end cost based on aerial installation with 30% new poles, while high-end cost assumes 40% aerial and 60% trenching

3 Low-end costs only assumed here since trenching would be cost-prohibitive; other technologies likely more relevant if not aerial fiber

4 Assumed 20% of non-libraries already have fiber available, based on the percentage (19%) of U.S. commercial buildings connected to fiber with over 20 employees. For public libraries, 13% are assumed to have fiber and were adjusted as such. See p. 5.

Sources: National Center for Education Statistics; InfoUSA; American Hospital Directory; TVA Rural Studies; CANARIE Inc.; Outside Plan Consulting Inc.; FCC; Vertical Systems Group; company interviews and websites

PRELIMINARY

Installation costs per site may range from \$10,000 to \$200,000 depending on deployment technique and investment shared with other buildings⁴

	Average loop length ¹ feet	Low-end fiber deployment cost ² \$/foot	High-end fiber deployment cost ² \$/foot	Total cable cost ⁴ \$ Thousands	Termination cost ³ \$ Thousands	Total cost per site \$ Thousands
Urban	3,000	2-4 (aerial)	30-50 (40% aerial, 60% trenching)	10-60	5	15-65
Suburban	10,000	2-4 (aerial)	30-50 (40% aerial, 60% trenching)	30-200	5	35-205
Rural	20,000	2-4 (aerial installation, 30% new poles)	N/A (trenching is cost prohibitive)	60	5	65

1 iDate; Bruce L. Egan, "Improving Rural Telecommunications Infrastructure", TVA Rural Studies, http://www.rural.org/workshops/rural_telecom/egan/4.htm

2 Outside Plan Consulting Inc.; company websites

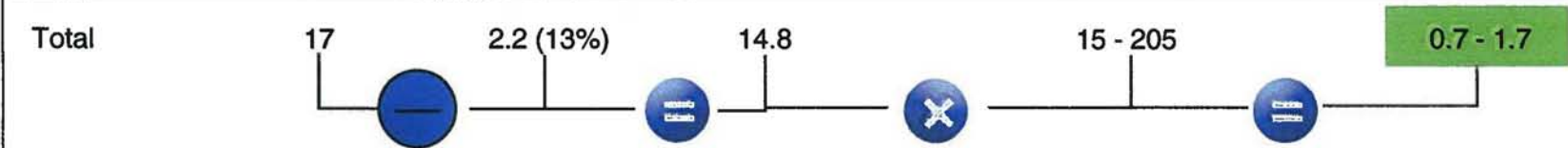
3 CANARIE Inc., "Community Condo Fiber Networks", February 2001, <http://www.canarie.ca/canet4/library/customer/ccfn.pdf>

4 Assume 50% cost share on the high end. A large-scale installation would have lower costs per site, as many cables would serve multiple sites

PRELIMINARY

Investment costs of \$0.7–1.7 billion to install fiber for 87% of public libraries currently without fiber

Population density ¹	Public libraries Thousands of locations; Percent within geography			\$ Thousands		\$ Billions	
	Total	With fiber ²	Needs fiber	Low-end	High-end	Low-end	High-end
				fiber cost per site ³	fiber cost per site ³	total fiber cost	total fiber cost
Dense Urban	1	0.3 (30%)	0.7	15	65	<0.1	<0.1
Urban	2	0.6 (30%)	1.4	15	65	<0.1	0.1
Suburban	6	0.9 (15%)	5.1	35	205	0.2	1.0
Rural	8	0.4 (5%)	7.6	65	65 ⁴	0.5	0.5



- 1 Determined by zip code population density: Rural: <1,000 persons per square mile, Suburban: between 1,000 and 4,000, Urban: between 4,000 and 10,000, and Dense Urban: >10,000. Some locations (305 hospitals and 446 libraries) did not match zip codes in the most recent GIS
- 2 Of the 2,229 library outlets that reported a Fiber connection 41% are urban (908), 41% are suburban (905), 16% are rural (366), and 2% are unknown (50); *Gates Foundation / LRW –National Broadband Assessment, 2009.*
- 3 Low-end cost based on aerial installation with 30% new poles, while high-end cost assumes 40% aerial and 60% trenching
- 4 Low-end costs assumed here since trenching would be cost-prohibitive; other technologies likely more relevant if not aerial fiber