

108. Demand-side programs can effectively promote the adoption and use of broadband among underserved and rural populations.<sup>254</sup> Congress already has taken important steps in this regard. For example, the BTOP program, established by the Recovery Act, provides funding for, among other measures, grants to provide broadband education, awareness, training, access, equipment, and support to educational institutions, libraries, healthcare providers, and other community support organizations to facilitate greater use of broadband. The Recovery Act also directs grants to support organizations and agencies that provide outreach, access, equipment, and support services to facilitate greater use of broadband service by low-income, unemployed, aged, and otherwise vulnerable populations.<sup>255</sup> The Recovery Act provides, in addition, at least \$250 million in funding for innovative programs to encourage sustainable adoption of broadband service.<sup>256</sup> In singling out these purposes, Congress recognized the importance of consumer affordability and education in ensuring the adoption and sustainability of rural broadband networks.

109. In its *National Broadband Plan* proceeding, the Commission is exploring long-term solutions to address the lack of demand for broadband services.<sup>257</sup> Specifically, the *National Broadband Plan NOI* sought comment on improving digital literacy and media literacy skills, increasing broadband access device ownership, and the effect of content and copyright protections on broadband network deployment and usage.<sup>258</sup> The *National Broadband Plan NOI* also sought comment on the extent to which a centralized clearinghouse for outreach and computer and broadband training initiatives should be a component of the national broadband plan.<sup>259</sup>

110. Some training and education programs are already underway to increase adoption of broadband in local communities.<sup>260</sup> Rural libraries, which currently serve as an access point for broadband Internet service, can provide another avenue for Internet training and education, as librarians are well-positioned to educate and train individuals on the benefits of Internet access.<sup>261</sup> Further, libraries can stimulate demand for broadband services by hosting community fora and providing training on accessing specific information.<sup>262</sup> Rural libraries can also function as public computing centers, providing broadband Internet access to patrons, which in turn can help stimulate further demand for consumer broadband services.<sup>263</sup> We suggest that Internet education focus on general digital literacy as well as the

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<sup>254</sup> See, e.g., Benton Foundation Comments at 8, Attach. at 7, 10; Rural Broadband Policy Group Comments at 1; Connected Nation Comments at 3, 9; NASUCA Comments at 5–6; NCTA Comments at 15, Attach. at 1–2, 4.

<sup>255</sup> Recovery Act § 6001(b).

<sup>256</sup> Recovery Act, Division A, Title II, National Telecommunications and Information Administration (Broadband Technology Opportunities Program Appropriations).

<sup>257</sup> *National Broadband Plan NOI* at paras. 55–57.

<sup>258</sup> *Id.*

<sup>259</sup> *Id.*

<sup>260</sup> For example, Connected Nation operates community-based organizations that sponsor computer training and education to increase the value of accessing the Internet for businesses. Connected Nation Comments at 10. Connected Nation also sponsors grassroots “eCommunity Leadership Teams” comprised of community leaders from key sectors that develop and implement technology promotion plans within their communities. Connected Nation Comments at 11–12. However, we note that these programs are not necessarily specifically directed to rural areas.

<sup>261</sup> See ALA Comments at 3.

<sup>262</sup> See ALA Comments at 3, 6.

<sup>263</sup> Public computing facilities can provide numerous benefits to users in the community. See generally U.S. Dep’t of Hous. and Urban Dev., Multifamily Housing – Neighborhood Networks, <http://www.hud.gov/offices/hsg/mfh/nnw/nnwaboutn.cfm> (last visited May 19, 2009) (describing HUD’s Neighborhood Networks initiative, which encourages property owners and managers to open onsite, multiservice technology centers, which has resulted in

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many Internet-based resources that can benefit users, such as access to healthcare information, education of children and adults, financial planning, online banking, online shopping, and electronic mail. Further, it is imperative that education and training initiatives be forward-looking to ensure continued and sustained subscription to broadband services in rural areas.

111. Both public and private entities, including broadband providers, should consider programs designed to stimulate broadband adoption and sustainability among targeted groups. Pennsylvania has established a special program that aggregates demand in communities looking to achieve an agreed-upon deployment threshold.<sup>264</sup> This program provides state grants for outreach and demand aggregation activities, including programs on the benefits and use of broadband services.<sup>265</sup> Communities may also want to consider ways to aggregate or consolidate demand as part of developing a strategy for a sustainable broadband network.<sup>266</sup> Participants in this effort could include individual consumers, businesses, educational institutions, health care facilities, and government agencies. Entities that can function as anchor tenants with adequate demand to both spur broadband infrastructure investment and ensure sustainability can function as an integral part of a rural broadband strategy.

112. Furthermore, public and private entities also should consider programs, such as making computers or laptops available at a discount to qualifying households or discounting monthly service, designed to make broadband affordable to those with low incomes.<sup>267</sup> The Commission has also sought comment on establishing a Broadband Lifeline/Link Up pilot program to examine how the low-income universal service support program can be used to enhance access to broadband Internet access services for low-income Americans.<sup>268</sup>

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more than 1,400 Neighborhood Networks centers across the U.S. that offer job-training classes in computer skills, resume writing, and interviewing techniques; job placement services; General Educational Development (GED) preparation; English as a Second Language (ESL) classes; programs that allow seniors to become familiar with computers and use them to better their lives, whether through staying in touch with family and friends via e-mail or searching for healthcare benefits online; and computer access for children whose families cannot afford their own).

<sup>264</sup> See Pennsylvania Comments at 2.

<sup>265</sup> See PA. DEP'T OF CMTY. AND ECON. DEV., BROADBAND OUTREACH AND AGGREGATION FUND, PROGRAM GUIDELINES 1 (June 2006), <http://www.newpa.com/download.aspx?id=989>.

<sup>266</sup> For example, Pennsylvania has established a special program that aggregates demand in communities looking to achieve an agreed upon deployment threshold. See Pennsylvania Comments at 2.

<sup>267</sup> See, e.g., NCTA Comments at 15. For example, recognizing that customer premises equipment (CPE) costs can be a barrier to broadband implementation and adoption, the National Rural Telecommunications Cooperation (NRTC) recently announced a subsidized leasing program for its members to pass on to customers in their rural markets. Thus, WildBlue satellite service customers can now gain access to the service for just \$99, which includes CPE and installation. Under this program, the actual CPE cost of \$400 is subsidized by NRTC and its members. This program has been launched as a test to help expand access to broadband. NRTC Comments at 6.

<sup>268</sup> See *High-Cost Universal Service Support; Federal-State Joint Board on Universal Service; Lifeline and Link Up; Universal Service Contribution Methodology; Numbering Resource Optimization; Implementation of the Local Competition Provisions in the Telecommunications Act of 1996; Developing a Unified Intercarrier Compensation Regime; Intercarrier Compensation for ISP-Bound Traffic; IP-Enabled Services*, CC Docket Nos. 01-92, 99-200, 99-68, 96-98, 96-45, WC Docket Nos. 06-122, 05-337, 04-36, 03-109, Order on Remand and Report and Order and Further Notice of Proposed Rulemaking, FCC 08-262, para. 40; app. A, paras. 64-91; app. C, paras. 60-87 (rel. Nov. 5, 2008) (*November 2008 Further Notice*). Specifically, the Commission sought comment on making available \$300 million each year for three years to enable eligible telecommunications carriers to provide discounts on broadband Internet access service and the necessary access devices to low-income consumers. See *id.* The Commission's existing Low-Income program, discussed *infra*, helps ensure that the costs of starting and continuing (continued....)

**D. Addressing Network Costs**

113. As a general matter, the costs involved in deploying a broadband network are significant, requiring providers to purchase electronic equipment,<sup>269</sup> obtain access to rights of way,<sup>270</sup> interconnect with other networks, and construct the actual network.<sup>271</sup> Yet, rural networks can often be even more expensive to deploy and potentially more expensive to maintain than networks in non-rural areas for a variety of reasons, which can serve as a formidable barrier to rural broadband deployment.<sup>272</sup> Rural broadband networks typically serve far fewer customers per square mile than urban and suburban networks,<sup>273</sup> and often cover larger land areas that may include challenging topographies and climate conditions,<sup>274</sup> making it extremely costly to provide broadband service to remote areas.<sup>275</sup> For example, the topography in such areas may limit the reach of wireless transmission facilities on individual towers, and, consequently, more towers may need to be built, thereby increasing the cost of wireless broadband deployment. Similarly, because radio signals using spectrum below 1 GHz generally penetrate environmental obstructions better than signals using higher bands,<sup>276</sup> licensees with spectrum only in the higher frequency bands may need to deploy more infrastructure, including towers, to cover the same land area, which can also lead to higher deployment costs in rural areas. In addition, the cost of extending telecommunications lines to remote areas contributes to higher deployment costs in rural areas. It is notable that costs may vary among, for example, fiber,<sup>277</sup> digital subscriber line (DSL),<sup>278</sup> and cable deployment.<sup>279</sup>

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telephone service do not prevent low-income consumers from receiving telephone service. *See infra* Part VI.A (discussing Universal Service).

<sup>269</sup> *See* HierComm Comments, Attach. 3, tbl. 18 (listing equipment and costs for wireless broadband deployers).

<sup>270</sup> *See generally* Fibertech/KDL Comments (discussing pole make ready costs and rents).

<sup>271</sup> *See generally* HierComm Comments, Attach. 1 (discussing assessments made by deployers).

<sup>272</sup> *See* GAO, BROADBAND DEPLOYMENT IS EXTENSIVE THROUGHOUT THE UNITED STATES, BUT IT IS DIFFICULT TO ASSESS THE EXTENT OF DEPLOYMENT GAPS IN RURAL AREAS, GAO-06-426, at 19 (May 2006) (GAO BROADBAND REPORT); Embarq Comments at 3 (stating that the high cost of deployment remains the “principal barrier to rural advanced services”); MSS/ATC Coalition Comments at 3 (asserting that both wireline access and terrestrial wireless networks are economically impractical in remote areas).

<sup>273</sup> *See, e.g.*, Embarq Comments at 12 n.18 (noting the cost differences per line between rural customers that live in a cluster and those in outlying areas); Stephouse Networks Comments at 2 (describing the low population densities and mountainous terrain of its service areas).

<sup>274</sup> For example, commenters point out that deployment in rural areas can be especially expensive and complicated because of relatively inaccessible, rugged terrain. *See* Valerie Fast Horse Comments at 3 (describing low and thickly forested areas where there are “no possible means to deliver broadband”); PBIA Comments at 6 (stating that because of their remoteness and challenging terrain, the communities of western Alaska have not been accessible to fiber networks). This terrain often includes mountains or forests that can obstruct wireless technologies that require line-of-sight transmission. GAO BROADBAND REPORT at 19; *see also supra* Part V.A (discussing Technological Considerations).

<sup>275</sup> *See, e.g.*, NRECA Comments at 1 (stating that “[l]ow population densities coupled with the issue of traversing vast expanses of remote and often rugged topography” create a financial barrier to rural broadband deployment); Embarq Comments at 13 (“In rural America, however, high-costs and low population densities make investment and provision of broadband service uneconomic (just as has been and still is the case with basic voice service pursuant to carrier-of-last-resort obligations).”).

<sup>276</sup> *See supra* Part V.A (discussing Technological Considerations).

<sup>277</sup> *See, e.g.*, VT. DEP’T OF PUB. SERV., UNDERSTANDING BROADBAND DEPLOYMENT IN VERMONT 14 (2007), <http://publicservice.vermont.gov/Broadband/Broadband%20Deployment%20in%20Vermont%20Final.pdf> (VT.

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114. Access to adequate and affordable “middle-mile” broadband facilities—the facilities that are commonly used to connect the “last mile” ISP with an Internet backbone service provider—is a necessary precursor to a provider’s being able to deploy broadband services to its customers. Although rural broadband networks are fundamentally similar to broadband networks in non-rural areas in that they involve both a local access or distribution network<sup>280</sup> and a backhaul component,<sup>281</sup> rural broadband networks are also typically built in locations that are geographically more removed from Internet backbone nodes.<sup>282</sup> In many cases, because of this more distant location, the rural broadband provider will need to obtain backhaul transport, or “middle mile” facilities, from more than one provider, often over facilities that were designed for voice telephone or cable television services.<sup>283</sup> Some of these “middle mile” facilities may have insufficient capacity, causing the transmission speed on otherwise adequate last-mile broadband facilities to come to a crawl or stall before the data reach the Internet backbone.<sup>284</sup> Overcoming this may require the construction of a dedicated facility, which drives up costs and can deter last-mile broadband investments.<sup>285</sup> Moreover, even when the last-mile provider acquires access to adequate middle-mile facilities, that access may be prohibitively expensive.<sup>286</sup> Consequently, backhaul transport costs in rural areas can be significantly higher than for networks in other areas.<sup>287</sup>

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BROADBAND REPORT) (stating that in many rural areas of Vermont the average build-out cost for fiber-to-the-premise networks would likely be close to \$4,000 per subscriber).

<sup>278</sup> NATIONAL EXCHANGE CARRIER ASSOCIATION, *THE PACKET TRAIN NEEDS TO STOP AT EVERY DOOR* 13 (2006) (estimating the cost of upgrading a traditional telephone line to DSL as follows: \$988 per line for the telephone company’s central office service area; \$1,083 per line for the mid-range service area; and \$4,865 per line for areas not served by central offices).

<sup>279</sup> *See, e.g.,* VT. BROADBAND REPORT at 13 (estimating the cost for cable line extensions in Vermont at \$20,000 per mile).

<sup>280</sup> The local access network, either wireline (*e.g.*, cable, DSL, fiber) or wireless (*e.g.*, WiMAX, EV-DO), connects a local network in a particular area, which could range in size from a single house or farm in a rural area to a small town.

<sup>281</sup> The backhaul network, which can be either wireline or wireless, connects the local network to an Internet backbone connection point.

<sup>282</sup> *See* NECA Comments at 5–6 (noting from its 2001 study that 55% of rural switches are more than 70 miles from an Internet Backbone Provider node and 10% are more than 200 miles away).

<sup>283</sup> *See* DigitalBridge Comments at 8–9 (“Many middle-mile facilities were originally built by telephone and cable companies for ordinary telecommunications or cable television services. Rural communities are often still reliant upon these antiquated copper telephone and cable infrastructures, which lack the capabilities to deliver high-speed, broadband access.”); *see also, e.g.,* City of Shafter Comments at 4 n.6.

<sup>284</sup> Commenters state that if an incumbent LEC does not build or tariff any high-capacity middle-mile lines, the ISP may have its data come to a crawl or stall as the data attempt to join the greater communications network using the LEC’s low-capacity facilities. *See* DigitalBridge Comments at 8–9; GCI Comments at 3.

<sup>285</sup> *See* Microsoft Comments at 4 (“We understand from some network operators, for example, that the local cost of upgrading wires and distributing broadband is not a hurdle. The marginal cost of adding subscribers to broadband systems can be more than covered by subscriber fees. However, rural or remote providers cannot take advantage of those economies, because the cost of acquiring high-capacity facilities between the Internet backbone and the community is too high. Once this hurdle is overcome, we believe that in many instances the market can remedy the problem of delivering affordable broadband to Main Street and neighborhoods.”).

<sup>286</sup> *See* NECA Comments at 6 n.15 (quoting Verizon as stating that “[i]n some rural high-cost areas, however, the cost of the additional transport mileage is high enough to impinge on a rural broadband provider’s ability to offer services in those areas”); *see also* OPASTCO Comments at 8–9 (“Another significant obstacle that rural ILECs face in deploying broadband to additional rural consumers and increasing the broadband speeds that they offer is the high price of access to the Internet backbone. The price of backbone access is based upon mileage, among other factors,

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115. There is no one solution to addressing middle mile transport costs in rural areas. Commenters suggest explicitly encouraging middle-mile buildout,<sup>288</sup> revising universal service funding to help cover costs of the middle-mile,<sup>289</sup> and using current or potential infrastructure more effectively by coordinating with other infrastructure projects to shrink deployment costs, and reforming interconnection obligations.<sup>290</sup> Others suggest that these facilities be offered at cost-based or favorable rates on nondiscriminatory terms and conditions.<sup>291</sup>

116. The regulatory process associated with obtaining access to rights of way on “Indian lands” may add to the costs of bringing broadband services to Tribal members. These high costs of deploying broadband to rural areas can be compounded by potential providers’ experiencing difficulties gaining access to capital.<sup>292</sup> Gaining access to capital can be a problem for rural providers that have fewer customers over whom they can spread the costs of providing broadband service. This entry barrier increases with the more capital that is needed to cover minimum costs,<sup>293</sup> which can be particularly pronounced in rural areas.

117. Although the free market has many benefits, such as driving down the costs of services for consumers and improving service quality, it also can leave behind geographic areas with high costs and lower profit potential.<sup>294</sup> Such is the case with many rural areas. Market forces often demand returns commensurate with investment risk. In many parts of rural America, the relatively high deployment costs per potential customer make relying on market forces alone an inadequate strategy for promoting the

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and the further removed a carrier is from a backbone facility, the higher the price they must pay. Thus, rural ILECs who are on average much further away from these facilities face higher than average costs for Internet backbone access. In addition, rural ILECs that wish to upgrade their broadband networks to provide their customers with higher speeds must also upgrade their backbone access, incurring even higher costs. Moreover, the majority of rural ILECs have only one choice of provider for connecting to the Internet backbone.” (citations omitted).

<sup>287</sup> Several commenters have expressed concern that high backhaul costs present a barrier to broadband deployment in rural areas. See DBC Comments at 8–9 (urging the Commission to ensure that affordable backhaul is available for rural operations); Fibertech/KDL Comments at 9 (stating that backhaul costs can be “prohibitively expensive” in rural areas); GCI Comments at 3 (citing cost-effective middle-mile transport as essential to broadband deployment in rural Alaska); ACA Comments at 3 (arguing that grant and loan programs should allow operators to build middle-mile fiber backhaul infrastructure to increase speeds and lower operational costs).

<sup>288</sup> See NECA Comments at 6–7 (encouraging partnerships and consortia by interested groups); see also generally ALA Comments at 2, CFA/CU Comments at 4, Microsoft Comments at 1–4 (all recommending using government funds to rollout fiber to anchor institutions, thereby providing incentives for last mile providers to buildout later).

<sup>289</sup> See NECA Comments at 6 nn.15–16.

<sup>290</sup> See Fibertech/KDL Comments at 2-3; New America Foundation Comments, Attach. at 3 (arguing that fiber should be deployed with highway construction); Letter from Michele C. Farquhar, Counsel to Sprint Nextel Corporation, Special Counsel to FiberTower Corporation and Rural Telecommunications Group, Inc. to Marlene H. Dortch, Secretary, FCC, GN Docket No. 09-29, ET Docket Nos. 04-186, 02-380 at 1-2 (filed Apr. 13, 2009) (Sprint Nextel *et al.* April 13, 2009 *Ex Parte* Letter) (asking the Commission to expand the amount of licensed spectrum that can be used for wireless backhaul services, such as White Spaces, which lie fallow in rural areas); City of Shafter Comments at 4 n.6 (noting that despite building a fiber network and having two Internet backbone providers nearby, the city had difficulty connecting directly to an Internet Backbone Provider).

<sup>291</sup> See NTCA Comments at 26–27; Sprint Comments at 8; OPASTCO Comments at 8–9.

<sup>292</sup> See, e.g., *Thirteenth CMRS Competition Report* at para. 100 (finding that the inability of new firms to borrow sums sufficient to finance efficient start-ups can be an entry barrier).

<sup>293</sup> See *id.*

<sup>294</sup> See *supra* Part III.B (The State of Broadband in Rural Areas).

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deployment of broadband services. The repercussions of relying on market forces alone ultimately would be felt throughout America because many of rural broadband's benefits go beyond the direct benefits to the rural subscriber and the direct profits to the broadband deployer.<sup>295</sup> Ultimately, as the Commission recognized regarding the need for universal telephone service,<sup>296</sup> the more individuals that are on the network, the greater value of the network itself.<sup>297</sup> Moreover, the more extensive a network, the greater the benefits to be derived from the network.<sup>298</sup> The same is true of an extensive broadband network.<sup>299</sup> Therefore, we believe that government action is needed to encourage deployment of broadband to rural areas.

118. To that end, various government entities have implemented programs to encourage the buildout of broadband infrastructure to rural areas. Recent legislation has created several opportunities for organizations seeking to build out broadband infrastructure and provide services to unserved and underserved areas to receive grants, loans, or loan guarantees to help defray deployment costs. In addition, a number of states have enacted tax incentives designed to help offset deployment costs in order

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<sup>295</sup> See *supra* Part III.A (Rural Broadband: Why it Matters).

<sup>296</sup> See *Federal-State Joint Board on Universal Service*, CC Docket No. 96-45, Report and Order, 12 FCC Rcd 8776, 8783, para. 8 (1997) (subsequent history omitted) (*Universal Service First Report and Order*) (“At the simplest level, increasing the number of people connected to the telecommunications network makes the network more valuable to all of its users by increasing its usefulness to them.”).

<sup>297</sup> This “network effect” is a reason why the Commission has an explicit universal service program to ensure that people are connected to the telephone network. See *id.* A “network effect” may be illustrated by observing that all else being equal (with two non-interconnected networks), a customer is more likely to choose a network that serves 80% of the population, instead of one that serves 20% of the population, because the larger network is more likely to serve more people that the customer may want to call. See JONATHAN E. NUECHTERLEIN & PHILIP J. WEISER, *DIGITAL CROSSROADS* 4–5 (2005); Big Think Strategies Comments at 7.

<sup>298</sup> Aside from network effects, larger networks also have other indirect benefits, or positive externalities, that arise merely because the network reaches more users. In the *Universal Service First Report and Order*, the Commission noted that “[i]ncreasing subscribership also benefits society in ways unrelated to the value of the network per se. For example, all of us benefit from the widespread availability of basic public safety services, such as 911.” See *Universal Service First Report and Order*, 12 FCC Rcd at 8783, para. 8.

<sup>299</sup> A broadband-connected Internet also produces network effects. Unlike dial-up connections, broadband connections can be used to create “two-way networks” for applications like VoIP and video conferencing. See *supra* notes 178–184 (listing interactive broadband applications). In addition to these network effects, ubiquitous broadband would produce other positive externalities. See Big Think Strategies Comments at 17. For instance, a vastly interconnected broadband network would allow Next Generation 911 to be deployed throughout the country to the benefit of those who live in or may visit areas that otherwise would lack access to broadband services. See DEP’T OF TRANS., *NEXT GENERATION 9-1-1 SYSTEM PRELIMINARY CONCEPT OF OPERATIONS* (2005), <http://www.its.dot.gov/NG911/pdf/ConOps.pdf>. Dial-up connections are increasingly impractical for many Internet applications; thus, dial-up users do not add as great a value to the network and cannot contribute to as many of the positive externalities as broadband-connected users. See *generally supra* Part III.A (describing the benefits of broadband).

to encourage the provision of broadband services to consumers.<sup>300</sup> Many rural cooperatives are deploying broadband to rural areas through collaborative efforts and by obtaining federal or state funding support.<sup>301</sup>

119. An alternative solution that has been adopted in some areas is government sponsorship or ownership of broadband networks.<sup>302</sup> Commenters suggest that many successful government-sponsored investments in the United States have involved the deployment of fiber networks in cities;<sup>303</sup> however, some rural areas also have benefited from government-sponsored broadband deployment.<sup>304</sup> Although many have expressed concerns regarding the provision of government-sponsored or government-owned broadband services, raising questions about the appropriate role of government as a broadband service

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<sup>300</sup> See, e.g., MISS. CODE ANN. § 57-87-1 *et seq.* (providing tax credits to providers that deploy broadband equipment, ranging from five to 15% of the cost of the broadband equipment, with the higher tax credits going to those providers that deploy equipment in the least populous regions of the state); FLA. STAT. § 220.183 (providing receive income tax credits to broadband providers for any project designed to increase a community's access to broadband facilities, including those communities located in rural areas); HAW. REV. STAT. § 235-110.51 (providing that up to 4 % of a commercial building's renovations costs may be deducted if the building's telecommunications facilities are upgraded to high-speed telecommunications systems that can provide Internet access, direct satellite communications access, and videoconferencing facilities).

<sup>301</sup> See Chuck Huckaby, *Maryland Broadband Cooperative Connects Rural Counties*, WORK AT HOME BUSINESS OPPORTUNITIES, Oct. 11, 2007, <http://work-at-home.business-opportunities.biz/2007/10/11/maryland-broadband-cooperative-connects-rural-counties/> (last visited May 13, 2009) (describing the Maryland Broadband Cooperative (MDBC)'s connection of nine counties via fiber optic cable and plans to lay fiber optic cable through Western Maryland); Ryan Bentley, *Cooperative Ready to Begin Making Broadband a Reality by Early Summer*, PETOSKEY NEWS REVIEW, Apr. 23, 2008, <http://www.petoskeynews.com/articles/2008/04/23/news/doc480f396d259ba659116224.prt> (last visited May 13, 2009) (announcing plans to seek rural development loans from the USDA to fund broadband infrastructure deployment to residents and businesses in 12 rural counties in Northern Michigan); SCTC Comments at 2 (stating that it offers nearly ubiquitous DSL service, ranging in speeds from 1.5 Mbps download/512 Kbps upload to 6 Mbps download/1 Mbps upload, to a broad region that includes Salem, Oregon).

<sup>302</sup> A number of previously unserved or underserved communities have sponsored or deployed local broadband networks (consisting of either fiber, cable, or wireless networks). See *infra* notes 303–304 (listing communities that have sponsored or deployed local broadband networks); see also Allan J. Hastings Comments at 2 (stating that public development of shared digital roads, managed just as traditional roads are managed, lowers the costs for private sector service providers and creates new opportunities for start-up companies and incumbent providers that have said they cannot afford to build fiber networks in rural areas); Big Think Strategies Comments at 7 (noting no strong objection to government owned and operated infrastructure since governmental units in the United States today typically provide roads, water and sewer service, and airports as well as a great deal of gas distribution, electrical service, and health care).

<sup>303</sup> Communities such as Minneapolis, Minnesota, Lafayette, Louisiana, and Fort Wayne, Indiana, have deployed high speed networks. See Benton Foundation Comments at 11, nn.19–20; Esme Vos, *Muniwireless Updates List of Cities and Counties with Large Wi-Fi Networks*, MUNIWIRELESS, Mar. 28, 2009, <http://www.muniwireless.com/2009/03/28/muniwireless-list-of-cities-with-wifi/> (article includes a link to the list of cities, available at <http://www.muniwireless.com/reports/Mar-28-2009-list-of-cities.pdf>).

<sup>304</sup> We note that counties in rural areas such as Allegheny County, Maryland; Craven County, North Carolina; and Cambria County, Pennsylvania, are just a few that have sponsored deployment of county-wide networks. AllCoNet.org, What is AllCoNet, <http://www.allconet.org/> (last visited Apr. 29, 2009); *Craven County, North Carolina Goes Wireless: Rural Wi-Fi Connects Schools, Towns*, MUNIWIRELESS, June 6, 2008, <http://www.muniwireless.com/2008/06/06/craven-county-north-carolina-goes-wireless-rural-wi-fi-connects-schools-towns>; Cambria Connected, *Introducing a New Way to Communicate in Cambria County*, <http://www.cambriacconnected.net/> (last visited May 11, 2009); Melissa Block, *Widening the Internet Highway to Rural America*, NATIONAL PUBLIC RADIO, Dec. 14, 2005, <http://www.npr.org/templates/story/story.php?storyId=5053488> (last visited May 19, 2009).

provider,<sup>305</sup> the potential for market distortion,<sup>306</sup> and the consequences of unfair competition,<sup>307</sup> others assert that government sponsorship is the best solution in rural areas where existing service providers and private entities have not invested in building broadband infrastructure.<sup>308</sup> Internationally, we note that several countries have undertaken government-sponsored efforts to provide broadband services nationwide. One example is the Australian government's recent announcement that it plans to upgrade its broadband infrastructure to deliver up to 100 Mbps to 90 percent of homes and offices in Australia.<sup>309</sup> Remote and sparsely populated regions of that country will receive wireless broadband service with speeds up to 12 Mbps.<sup>310</sup> Similarly, France's "dead zone programme," created in 2003, allows operators to use public funds to provide mobile telephony coverage ultimately to 3,000 towns in France.<sup>311</sup> Sweden has adopted the "stadsnät" urban area network model under which a city builds and administers fiber infrastructure, which it then rents at cost to service providers that deploy their own transmission equipment.<sup>312</sup>

120. A complementary government role in broadband deployment can yield advantages that a free market solution cannot achieve alone. For example, government involvement in rural broadband may increase the efficiency and reliability of local services, such as law enforcement and emergency

<sup>305</sup> See Craig Dingwall, *Municipal Broadband: Challenges and Perspectives*, 56 FED. COMM. L.J. 92, 92 (2006).

<sup>306</sup> See FED. TRADE COMM'N STAFF, MUNICIPAL PROVISION OF WIRELESS INTERNET 28-35 (2006), <http://www.ftc.gov/os/2006/10/V060021municipalprovwirelessinternet.pdf> (FTC REPORT).

<sup>307</sup> See FTC REPORT at 30; Dingwall, *supra* note 305, at 92.

<sup>308</sup> See, e.g., Art Menius Comments at 2 (urging adoption of a federal rural broadband policy that encourages local ownership of broadband infrastructure and public ownership of broadband infrastructure in areas where private entities are not forthcoming in building broadband infrastructure). We note that at least 35 states have considered limiting municipal broadband, and at least 19 states have enacted legislation specifically addressing municipal broadband. See A.H. Tapia & J.A. Ortiz, *Municipal Responses to State-Level Broadband Internet Policy 2* (Sept. 2006), available at [http://web.si.umich.edu/tprc/papers/2006/554/TPRCfinal\\_pdf.pdf](http://web.si.umich.edu/tprc/papers/2006/554/TPRCfinal_pdf.pdf); see also, e.g., ARK. CODE ANN. § 23-17-409(b)(1) (West 2009); COLO. REV. STAT. ANN. § 29-27-201 (West 2009); FLA. STAT. ANN. § 166.047 (West 2009); IOWA CODE ANN. § 388.10 (West 2009); LA. REV. STAT. ANN. § 45:884.41, *et seq.* (2009); MICH. COMP. LAWS ANN. § 484.2252 (West 2009); MINN. STAT. ANN. § 237.19 (West 2009); MO. ANN. STAT. § 392.410 (West 2009); NEB. REV. STAT. ANN. §§ 86-575, 594 (West 2009); NEV. REV. STAT. ANN. §§ 268.086, 710.147 (West 2009); OHIO REV. CODE ANN. § 1332.01, *et seq.* (West 2009); 66 PA. CONS. STAT. ANN. § 3014(h) (West 2009); S.C. CODE ANN. § 58-9-2600, *et seq.* (2009); TENN. CODE ANN. § 7-52-601, *et seq.* (West 2009); TEX. UTIL. CODE ANN. § 54.201 (2009); UTAH CODE ANN. § 10-18-201, *et seq.* (West 2009); VA. CODE ANN. § 15.2-2160 (West 2009); WASH. REV. CODE ANN. § 54.16.330 (West 2009); WIS. STAT. ANN. § 66.0422 (West 2009). The Supreme Court has upheld the legality of regulations restricting municipal provision of broadband service. See *Nixon v. Missouri Municipal League*, 541 U.S. 125 (2004) (determining that the Communications Act does not preempt states from restricting municipal provision of telecommunications services). Some states prohibit or strictly limit municipal provision of broadband, while others impose some or all of the following: hearings, local referendums, cost-benefit analyses, feasibility studies, and strict rules against cross-subsidization.

<sup>309</sup> See Esme Vos, *Australia Plans 100 Mbps to 90 Percent of Homes and Offices*, MUNIWIRELESS, Apr. 7, 2009, <http://www.muniwireless.com/2009/04/07/australia-plans-100mbps-national-network/>.

<sup>310</sup> *Id.* To accomplish this enormous task, the Australian government will establish a new company that will deploy the network in partnership with the private sector. The Australian government estimates that the network will cost \$31 billion and take eight years to build. *Id.*

<sup>311</sup> Under Phase I of France's program, for which public funding of \$44 million is allocated for passive infrastructure, the goal is to target coverage of some 1,800 towns with 1,250 sites. See AUTORITÉ DE RÉGULATION DES COMMUNICATIONS ÉLECTRONIQUES ET DES POSTES, ARCEP ANNUAL REPORT: 2007, at 338 (2007), [http://www.arcep.fr/fileadmin/uploads/tx\\_gspublication/rap2007-eng.zip](http://www.arcep.fr/fileadmin/uploads/tx_gspublication/rap2007-eng.zip) (last visited May 13, 2009).

<sup>312</sup> Big Think Strategies Comments at 14 (stating that more than thirty organizations in Stockholm have set up their own transmission equipment and built their facilities using the municipality's open fiber network).

services;<sup>313</sup> promote job growth and economic development by attracting and retaining businesses and increasing use of technology in a community;<sup>314</sup> provide educational benefits, both for local schools and those seeking education online;<sup>315</sup> and generally generate the indirect benefits to America that private employers may not consider in their cost-benefit profit assessments.<sup>316</sup> Finding creative solutions to overcome the hurdles presented by high deployment costs will require the development of a multi-faceted approach, including, among other things, collaborative efforts among federal, Tribal, state, and local governments, community organizations, businesses, and individuals; federal and state funding; government ownership or sponsorship; and continuation of the important contributions made by the rural cooperatives spread across this nation.

### VI. OVERCOMING CHALLENGES TO RURAL BROADBAND DEPLOYMENT

121. The 2008 Farm Bill directs that this Report include recommendations “to identify how specific Federal agency programs and resources can best respond to rural broadband requirements and overcome obstacles that currently impede rural broadband deployment.”<sup>317</sup> Throughout this Report, we have identified how Federal agency programs can respond better and overcome obstacles that impede rural broadband deployment.<sup>318</sup> In this part, we provide recommendations concerning the Commission’s existing programs and resources.

122. During recent years, the Commission has not had a comprehensive strategy regarding how its programs and resources can best respond to rural broadband requirements or promote rural broadband deployment. The Commission’s approach generally has been to prevent or remove “economic” regulation of broadband services. For example, the Commission established a deregulatory environment for the provision of broadband Internet access service by classifying that service as an information service regardless of the nature of the platform over which it is provided,<sup>319</sup> and by

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<sup>313</sup> See FTC REPORT at 20.

<sup>314</sup> See FTC REPORT at 22–23.

<sup>315</sup> See FTC REPORT at 23.

<sup>316</sup> Big Think Strategies Comments at 17 (“On some level this is simple economics: there are strong positive externalities to having a robust and open communications infrastructure, which means that the benefits of such an infrastructure exceed—we believe, far exceed—the returns that the operator of the network can actually extract from its users. This means that the economically and socially optimal open network will never be financed and built by private entities—again, they cannot capture the benefits that arise from such a network so they will have no incentive to build it.”).

<sup>317</sup> 2008 Farm Bill § 6112(a)(1)(D).

<sup>318</sup> See *supra* Part IV.A (discussing Promoting Interagency Coordination).

<sup>319</sup> *Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities; Internet Over Cable Declaratory Ruling; Appropriate Regulatory Treatment for Broadband Access to the Internet Over Cable Facilities*, CS Docket No. 02-52, Declaratory Ruling and Notice of Proposed Rulemaking, 17 FCC Rcd 4798, 4801, para. 4 (2002) (*Cable Modem Declaratory Ruling*), *aff’d Nat’l Cable & Telecomms. Ass’n v. Brand X Internet Servs.*, 545 U.S. 967 (2005) (*NCTA v. Brand X*) (cable modem Internet access service); *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities; Universal Service Obligations of Broadband Providers; Review of Regulatory Requirements for Incumbent LEC Broadband Telecommunications Services; Computer III Further Remand Proceedings: Bell Operating Company Provision of Enhanced Services; 1998 Biennial Regulatory Review—Review of Computer III and ONA Safeguards and Requirements; Conditional Petition of the Verizon Telephone Companies for Forbearance Under 47 U.S.C. § 160(c) with Regard to Broadband Services Provided via Fiber to the Premises; Petition of the Verizon Telephone Companies for Declaratory Ruling or, Alternatively, for Interim Waiver with Regard to Broadband Services Provided via Fiber to the Premises; Consumer Protection in the Broadband Era*, CC Docket Nos. 02-33, 95-20, 98-10, 01-337, WC Docket Nos. 04-242, 05-271, Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd 14853 (2005) (*Wireline Broadband Internet Access Services Order*), *aff’d Time Warner Telecom, Inc. v. FCC*, 507 F.3d 205 (3d Cir. 2007) (wireline broadband Internet access

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eliminating legacy regulation that had applied to facilities-based wireline providers (but not to other providers) of that service.<sup>320</sup> Despite this generally deregulatory approach, the Commission has continued to impose regulatory obligations on broadband telecommunications services providers (although not on broadband Internet access service providers) to the extent it was needed to further important public policies.<sup>321</sup>

123. The theory behind this generally deregulatory approach was that reliance on market forces, rather than regulation, was the best way to increase investment in broadband networks and make affordable broadband services available to consumers. In the *National Broadband Plan NOI*, the Commission has sought comment on competition as a mechanism to achieve the goals of the Recovery Act.<sup>322</sup> The results of this inquiry may require changes in specific Commission programs affecting rural broadband.

124. Because the national broadband plan is currently under consideration and is not due until February 2010, we have included here a compilation of pending Commission proceedings affecting rural broadband, including proceedings related to universal service, open network policies, spectrum access, intercarrier compensation, special access, pole attachments, tower siting, and video programming. The discussion of these proceedings here should not be construed as prejudging outcomes, which in any event must be based on the record before the Commission in those proceedings.

125. The 2008 Farm Bill requires that the Chairman of the Commission, in coordination with the Secretary of Agriculture, provide Congress with a full, updated rural broadband report two years from now.<sup>323</sup> We recommend that the next Commission Chairman consider completing a status report on rural broadband approximately one year from now. This status report will help inform Congress of the Commission's progress on these proceedings and of any needed changes to the recommendations in this Report in light of additional efforts to address rural broadband issues, including the completion of the national broadband plan.

### A. Universal Service Programs and Reform

126. The 1996 Act codified the historical commitment of the Commission and state regulators to promote universal service by ensuring that consumers in all regions of the nation have access to

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service); *United Power Line Council's Petition for Declaratory Ruling Regarding the Classification of Broadband over Power Line Internet Access Service as an Information Service*, WC Docket No. 06-10, Memorandum Opinion and Order, 21 FCC Rcd 13281 (2006) (*BPL-Enabled Internet Access Services Order*) (BPL-enabled Internet access service); *Appropriate Regulatory Treatment for Broadband Access to the Internet Over Wireless Networks*, WT Docket No. 07-53, Declaratory Ruling, 22 FCC Rcd 5901, 5909-10, para. 22 (2007) (wireless broadband Internet access service).

<sup>320</sup> *Wireline Broadband Internet Access Services Order*, 20 FCC Rcd at 14899, para. 86.

<sup>321</sup> See, e.g., *Petition of AT&T, Inc. for Forbearance Under 47 U.S.C. § 160(c) from Title II and Computer Inquiry Rules with Respect to Its Broadband Services and Petition of BellSouth Corporation for Forbearance Under 47 U.S.C. § 160(c) from Title II and Computer Inquiry Rules with Respect to Its Broadband Services*, WC Docket No. 06-125, Memorandum Opinion and Order, 22 FCC Rcd 18705 (2007) (*AT&T Enterprise Broadband Forbearance Order*) (retaining statutory and regulatory requirements designed to ensure the sufficiency of federal universal service support mechanisms, promote access to telecommunications services by individuals with disabilities, protect customer privacy, and increase the effectiveness of emergency services, among other objectives).

<sup>322</sup> See *National Broadband Plan NOI* at para. 49.

<sup>323</sup> The 2008 Farm Bill states that the "Chairman of the Federal Communications Commission, in coordination with the Secretary, shall update and evaluate the report described in subsection (a) during the third year after the date of enactment of this Act." 2008 Farm Bill § 6112(b).

## REPORT ON A RURAL BROADBAND STRATEGY

affordable, quality telecommunications services.<sup>324</sup> The 1996 Act added section 254 to the Communications Act, which directs the Commission, after consultation with the Federal-State Joint Board on Universal Service (Joint Board), to establish specific, predictable, and sufficient support mechanisms to preserve and advance universal service.<sup>325</sup> In addition, in section 254(b), Congress provided a list of principles upon which the Commission must base policies for the preservation and advancement of universal service.<sup>326</sup> Among other things, section 254(b) directs that quality services should be available at just, reasonable, and affordable rates; access to advanced telecommunications and information services should be provided in all regions of the nation; and consumers in all regions of the nation, including those in rural areas, should have access to telecommunications and information services that are reasonably comparable to those services provided in urban areas.<sup>327</sup>

127. To implement the universal service goals outlined in the 1996 Act, the Commission established the High-Cost Program, the Low-Income Program, the E-rate Program, and the Rural Health Care Program.<sup>328</sup> The universal service programs are funded by contributions from telecommunications carriers providing interstate telecommunications services and from certain other providers of interstate telecommunications.<sup>329</sup> While the universal service programs have primarily been focused on ensuring

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<sup>324</sup> Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 § 254 (1996) (codified at 47 U.S.C. § 254); see also *Federal-State Joint Board on Universal Service*, CC Docket No. 96-45, Notice of Proposed Rulemaking and Order Establishing Joint Board, 11 FCC Rcd 18092 (1996). Historically, the purpose of universal service support has been to promote universally available basic telephone service at reasonable and affordable rates. Before the 1996 Act, universal service was promoted largely through implicit support mechanisms.

<sup>325</sup> 47 U.S.C. § 254(a), (b)(5).

<sup>326</sup> 47 U.S.C. § 254(b)(1)–(7).

<sup>327</sup> 47 U.S.C. § 254(b)(1)–(3). Specifically, the Communications Act requires that universal service policies be based on the following principles: “(1) **QUALITY AND RATES.**—Quality services should be available at just, reasonable, and affordable rates. (2) **ACCESS TO ADVANCED SERVICES.**—Access to advanced telecommunications and information services should be provided in all regions of the Nation. (3) **ACCESS IN RURAL AND HIGH COST AREAS.**—Consumers in all regions of the Nation, including low-income consumers and those in rural, insular, and high cost areas, should have access to telecommunications and information services, including interexchange services and advanced telecommunications and information services, that are reasonably comparable to those services provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas. (4) **EQUITABLE AND NONDISCRIMINATORY CONTRIBUTIONS.**—All providers of telecommunications services should make an equitable and nondiscriminatory contribution to the preservation and advancement of universal service. (5) **SPECIFIC AND PREDICTABLE SUPPORT MECHANISMS.**—There should be specific, predictable and sufficient Federal and State mechanisms to preserve and advance universal service. (6) **ACCESS TO ADVANCED TELECOMMUNICATIONS SERVICES FOR SCHOOLS, HEALTH CARE, AND LIBRARIES.**—Elementary and secondary schools and classrooms, health care providers, and libraries should have access to advanced telecommunications services as described in subsection (h). (7) **ADDITIONAL PRINCIPLES.**—Such other principles as the [Federal-State Joint Board on Universal Service] and the Commission determine are necessary and appropriate for the protection of the public interest, convenience, and necessity and are consistent with this Act.” 47 U.S.C. § 254(b). The Commission adopted the additional principle that federal support mechanisms should be competitively and technologically neutral. *Federal-State Joint Board on Universal Service*, CC Docket No. 96-45, Report and Order, 12 FCC Rcd 8776, 8801–02, paras. 46–48 (1997) (*Universal Service First Report and Order*).

<sup>328</sup> In 2008, the Universal Service Administrative Company (USAC) disbursed approximately \$7.1 billion in universal service support: approximately \$4.4 billion for the High-Cost Program; approximately \$1.7 billion for the E-rate Program; approximately \$819 million for the Low-Income Program; and approximately \$49 million for the Rural Health Care Program. USAC, 2008 ANNUAL REPORT (2008) (USAC 2008 ANNUAL REPORT).

<sup>329</sup> Section 254(d) of the Communications Act directs that “[e]very telecommunications carrier that provides interstate telecommunications services shall contribute, on an equitable and nondiscriminatory basis, to the specific, predictable, and sufficient mechanisms established by the Commission to preserve and advance universal service.” 47 U.S.C. § 254(d). Section 254(d) further provides that “any other provider of interstate telecommunications may

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the availability of telecommunications services, the Commission has made efforts to expand broadband availability through universal service policies and is considering how to reform the programs to further expand broadband availability.<sup>330</sup> The four universal service programs currently treat the support of broadband differently. The Rural Health Care Program and the E-rate Program explicitly support the provision of broadband. The High-Cost Program indirectly supports the provision of broadband, and the Low-Income Program does not currently support broadband.

### 1. Rural Health Care Program

128. The Rural Health Care Program provides reduced rates for eligible rural health care providers for telecommunications and Internet services necessary for the provision of health care.<sup>331</sup> When the program was established, the Commission adopted an annual cap of \$400 million for universal service support for rural health care providers.<sup>332</sup> Despite modifications the Commission has made to the Rural Health Care Program, the program continues to be greatly underutilized and is not fully realizing the benefits intended by the Telecommunications Act of 1996 and the Commission's rules. For example, from 1997 to 2007, the program generally disbursed less than 10 percent of the authorized funds, and in 2008, the program disbursed slightly more than 10 percent of authorized funds.<sup>333</sup>

129. In 2007, in response to the underutilization of the program, the Commission established the Rural Health Care Pilot Program (Pilot Program) to provide, among other things, funding for the construction of state or regional broadband networks and for the advanced telecommunications and information services provided over those networks for health care providers.<sup>334</sup> The goal of the Pilot Program is to stimulate the deployment of the broadband infrastructure necessary to support innovative telemedicine services to rural America. In coordination with the U.S. Department of Health and Human Services (HHS), the Pilot Program also will support the advancement of HHS's health information technology (health IT) initiatives for electronic health records and create vital broadband links for disaster preparedness and emergency response to any large-scale emergency or public health crisis.<sup>335</sup> Under the Pilot Program, 67 projects are eligible to receive funding for telehealth networks serving 6,000 health care

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be required to contribute to the preservation and advancement of universal service if the public interest so requires.”  
*Id.* The Commission has determined that any entity that provides interstate telecommunications to others for a fee must contribute, based on contributors' interstate and international end-user telecommunications revenues, to the universal service fund. *Universal Service First Report and Order*, 12 FCC Rcd at 9183-84, para. 795. The Commission also requires certain other providers of interstate telecommunications to contribute to the universal service fund. See, e.g., *Universal Service Contribution Methodology*, WC Docket Nos. 06-122, 04-36, CC Docket Nos. 96-45, 98-171, 90-571, 92-237, 99-200, 95-116, and 98-170, Report and Order and Notice of Proposed Rulemaking, 21 FCC Rcd 7518 (2006) (*2006 Interim Contribution Methodology Order*) (requiring interconnected VoIP providers to contribute to the universal service fund), *aff'd in part and vacated in part on other grounds*, *Vonage Holdings Corp v. FCC*, 489 F.3d 1232 (D.C. Cir. 2007).

<sup>330</sup> See *November 2008 Further Notice*, apps. A, C (seeking comment on requiring recipients of high-cost support to offer broadband services, and seeking comment on a low-income support pilot program for broadband services).

<sup>331</sup> 47 C.F.R. Part 54, Subpart G.

<sup>332</sup> 47 C.F.R. § 54.623; *Universal Service First Report and Order*, 12 FCC Rcd at 9141, para. 705.

<sup>333</sup> USAC 2008 ANNUAL REPORT.

<sup>334</sup> See *Rural Health Care Support Mechanism*, WC Docket No. 02-60, Order, 22 FCC Rcd 20360 (2007) (*RHC Pilot Selection Order*); *Rural Health Care Support Mechanism*, WC Docket No. 02-60, Order, 21 FCC Rcd 11111 (2006) (*2006 Rural Health Care Pilot Program Order*). The Rural Health Care Pilot Program also supports costs associated with connecting to nationwide backbone providers, Internet2 or National LambdaRail, and connecting to the public Internet. See *RHC Pilot Selection Order*, 22 FCC Rcd at 20361, para. 2.

<sup>335</sup> See *2006 Rural Health Care Pilot Program Order*, 21 FCC Rcd 11111.

facilities in 42 states and three U.S. territories, using broadband technology to bring state-of-the-art medical practices to isolated rural communities.<sup>336</sup> Most recently, in April 2009, the Commission announced the approval of funding for: 1) the buildout of five networks that will link hundreds of hospitals regionally in Iowa, Minnesota, Montana, Nebraska, North Dakota, South Dakota, South Carolina, Wisconsin, and Wyoming; and 2) the design of a telehealth project in Alaska.<sup>337</sup>

## 2. E-rate Program

130. The E-rate Program provides discounts for telecommunications, Internet access, and internal connections for qualifying schools and libraries throughout the nation, including insular areas and isolated regions such as Tribal lands.<sup>338</sup> Schools and libraries can obtain E-rate funding for broadband under either the telecommunications or the Internet access category.<sup>339</sup> E-rate participants can also receive discounts on e-mail service; web hosting services; cabling, connectors, and related components used for eligible voice, video, and data transmission; and components used to distribute information from Internet access facilities to individual classrooms or public areas of a library.<sup>340</sup>

131. Since the inception of the E-rate Program, schools and libraries have received more than \$23.7 billion in funding commitments.<sup>341</sup> E-rate funding has provided millions of school children, teachers, and library patrons access to modern telecommunications and information services. In a study released in 2006, the National Center for Education Statistics (NCES) found that nearly 100 percent of public schools in the United States had Internet access, and 97 percent of these schools used broadband connections to access the Internet.<sup>342</sup> Today, Internet access in public schools is nearly ubiquitous; before the E-rate Program was established in 1997, only 78 percent of public schools had any Internet access at all. In 1997, only 27 percent of public school instructional classrooms had Internet access; that figure

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<sup>336</sup> See *RHC Pilot Selection Order*, 22 FCC Rcd 20360.

<sup>337</sup> Press Release, FCC, *FCC Update on Rural Healthcare Pilot Program Initiative* (Apr. 16, 2009), available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-290141A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-290141A1.pdf). Of the 67 projects, 29 have developed or posted requests for proposals (RFPs) to select vendors to build out their networks, while the remaining projects are preparing their RFPs as part of the competitive bidding process. *Id.*

<sup>338</sup> 47 C.F.R. Part 54, Subpart F; see also USAC, Schools and Libraries' Eligible Services List for Funding Year 2009, November 21, 2008, [http://www.usac.org/\\_res/documents/sl/pdf/ESL\\_archive/EligibleServicesList\\_112108.pdf](http://www.usac.org/_res/documents/sl/pdf/ESL_archive/EligibleServicesList_112108.pdf) (Funding Year 2009 ESL). The eligible services list (ESL) indicates whether specific products or services are eligible to receive discounts under the E-rate Program.

<sup>339</sup> Schools and libraries can apply discounts toward broadband connections that include digital subscriber lines (DSL), cable modems, fiber optics, integrated services digital networks (ISDN, BRI, PRI), satellite services, T1s, T2s, T3s, and fractional T1s. Funding Year 2009 ESL at 2, 3, 7.

<sup>340</sup> *Id.* at 6, 7, 10, 11.

<sup>341</sup> See USAC, Schools and Libraries Division, <http://www.sl.universalservice.org/funding/y1/national.asp> (1998–2008 data).

<sup>342</sup> U.S. DEPT. OF EDUC., INSTITUTE OF EDUC. SCI., *INTERNET ACCESS IN U.S. PUBLIC SCHOOLS AND CLASSROOMS: 1994-2005*, at 4–5 (2006), <http://nces.ed.gov/pubs2007/2007020.pdf>. The survey also found that nearly 100% of large schools were connected to the Internet using broadband while only 94% of small schools reported using broadband connections. *Id.* at 5. Although it is likely that the percentage of small schools using dial-up has decreased since 2006, any school still using dial-up will be limited in its use of the Internet and its applications.

increased to 94 percent by 2005.<sup>343</sup> A 2006 study found that 99 percent of public library branches are connected to the Internet, 98 percent of which offer public Internet access.<sup>344</sup>

132. As these figures demonstrate, the E-rate Program has been successful in connecting schools and libraries to the Internet using broadband. As those connections become obsolete or insufficient, however, the E-rate Program should continue to ensure that American schools and libraries remain competitive and on the forefront of technology. Schools will need E-rate funding for both the initial implementation of broadband access, as well as for the on-going costs to maintain and continuously improve their networks.<sup>345</sup> Broadband is essential to handle the applications available today, including online distance learning and videoconferencing. One of the next steps will be to determine what level of broadband is adequate for each school's needs.

133. In some schools, broadband is an integral part of the everyday curriculum and is used by students, teachers, and administrators to access online and distance learning; online assessment, data, and other administration resources; special education; and professional development. For example, the Bering Strait School District (BSSD) in Alaska uses SchoolAccess, a satellite network that provides basic connectivity and videoconferencing.<sup>346</sup> The BSSD is located in an area of coastal northwest Alaska that is about the size of Great Britain. It administers 15 schools that collectively have approximately 1,800 students.<sup>347</sup> Today, BSSD has satellite connections of at least three Mbps from each school to the district office in Unalakleet that are used to create a coherent sense of community throughout the district, provide educational opportunities to students, and allow teachers and administrators to meet without having to fly between communities.<sup>348</sup> Broadband has been critical to providing BSSD's students with the same high-quality educational opportunities available in non-rural communities.

### 3. High-Cost Program

134. The High-Cost Program is designed to ensure that consumers in rural, insular, and high-cost areas have access to telecommunications services at rates that are affordable and reasonably comparable to rates charged for similar services in urban areas.<sup>349</sup> The High-Cost Program does not explicitly support the provision of broadband; however, a carrier providing broadband services indirectly receives the benefits of high-cost universal service support when its network provides both the supported voice services and broadband services.<sup>350</sup>

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<sup>343</sup> *Id.* at 14, 16.

<sup>344</sup> INFO. USE MGMT. & POLICY INSTITUTE, COLLEGE OF INFO., FLA. STATE UNIV., PUBLIC LIBRARIES AND THE INTERNET 2006: STUDY RESULTS AND FINDINGS 1 (2006), [http://www.ii.fsu.edu/projectFiles/plinternet/2006/2006\\_plinternet.pdf](http://www.ii.fsu.edu/projectFiles/plinternet/2006/2006_plinternet.pdf).

<sup>345</sup> See STATE EDUC. TECH. DIRECTORS ASS'N, HIGH-SPEED BROADBAND ACCESS FOR ALL KIDS: BREAKING THROUGH THE BARRIERS 22–23 (2008), [http://www.setda.org/c/document\\_library/get\\_file?folderId=270&name=DLFE-211.pdf](http://www.setda.org/c/document_library/get_file?folderId=270&name=DLFE-211.pdf).

<sup>346</sup> *Id.* at 14–15.

<sup>347</sup> *Id.*

<sup>348</sup> *Id.*

<sup>349</sup> The program allows eligible carriers who serve these areas to recover some of their operating costs from the federal universal service fund. See 47 C.F.R. Part 54, Subpart D.

<sup>350</sup> The public switched network is not a single-use network, and modern network infrastructure can provide access not only to voice service, but also to data, graphics, video, and other services. The Commission's policies seek to promote the deployment of modern plant capable of providing access to advanced services. See *Federal-State Joint Board on Universal Service, Multi-Association Group (MAG) Plan for Regulation of Interstate Services of Non-* (continued....)

#### 4. Low-Income Program

135. The Low-Income Program provides discounts on telephone installation and monthly telephone service to low-income consumers through two programs.<sup>351</sup> The Commission's Link Up Program provides federal support to reduce eligible consumers' initial connection charges by up to one half and the Lifeline Program reduces qualifying consumers' monthly charges.<sup>352</sup> Qualified subscribers living on Tribal lands can receive discounts of up to \$35 per month on basic monthly telephone service,<sup>353</sup> and depending on current rates, may receive basic local phone service for as little as \$1 a month.<sup>354</sup> In addition, qualified subscribers on Tribal lands may receive a one-time discount on initial installation or activation of a wireline or wireless telephone for their primary residence.<sup>355</sup>

136. Although the Low-Income Programs do not currently provide support for broadband services, the Commission sought comment in 2008 on establishing a Broadband Lifeline/Link Up Pilot Program to examine how the universal service Low-Income Program can be used to enhance access to broadband Internet access services for low-income Americans.<sup>356</sup> Specifically, the Commission sought comment on making available \$300 million each year for three years to enable eligible telecommunications carriers to provide discounts on broadband Internet access service and the necessary access devices to low-income consumers.<sup>357</sup>

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*Price Cap Incumbent Local Exchange Carriers and Interexchange Carriers*, Fourteenth Report and Order, Twenty-Second Order on Reconsideration, and Further Notice of Proposed Rulemaking in CC Docket No. 96-45, and Report and Order in CC Docket No. 00-256, 16 FCC Rcd 11244, 11322, para. 200 (2001) (*Rural Task Force Order*).

<sup>351</sup> 47 C.F.R. Part 54, Subpart E.

<sup>352</sup> The Lifeline program currently provides low-income consumers with discounts of up to \$10.00 off of the monthly cost of telephone service for a single telephone line in their principal residence, though this amount adjusts, in part, to reflect the carrier's tariffed federal subscriber line charge. *See* 47 C.F.R. § 54.403. Link Up provides low-income consumers with discounts of up to \$30.00 off of the initial costs of obtaining telephone service. *See* 47 C.F.R. § 54.411(a). Under the Commission's rules, there are four tiers of federal Lifeline support. All eligible subscribers receive Tier 1 support, which provides a discount equal to the eligible telecommunications carrier's subscriber line charge. Tier 2 support provides an additional \$1.75 per month in federal support, available if all relevant state regulatory authorities approve such a reduction. (All fifty states have approved this reduction.) Tier 3 of federal support provides one half of the subscriber's state Lifeline support, up to a maximum of \$1.75. Only subscribers residing in a state that has established its own Lifeline/Link Up program may receive Tier 3 support, and they may receive this support only if their service provider is an eligible telecommunications carrier that has all necessary approvals to pass on the full amount of this total support in discounts to subscribers. Tier 4 support provides eligible subscribers living on tribal lands up to an additional \$25 per month towards reducing basic local service rates, but this discount cannot bring the subscriber's cost for basic local service to less than \$1. *See* 47 C.F.R. § 54.403.

<sup>353</sup> 54 C.F.R. § 54.403.

<sup>354</sup> 54 C.F.R. § 54.409(a)(4).

<sup>355</sup> 54 C.F.R. §§ 54.411; 54.415. The discount is up to 50% of the first \$60 of the installation fee. Qualified subscribers living on Tribal lands with installation or activation fees above \$60 receive an additional discount of up to \$70, bringing the total discount to a maximum of \$100. 54 C.F.R. §§ 54.411. The program also allows subscribers to pay the remaining amount that they owe on an interest-free deferred schedule.

<sup>356</sup> *See November 2008 Further Notice* at para. 40; app. A, paras. 64–91; app. C, paras. 60–87.

<sup>357</sup> *See id.*

## 5. Reform Efforts

137. The Communications Act specifies that “[u]niversal service is an evolving level of telecommunications service” that should be revisited periodically, and the Commission has been considering comprehensive universal service reform.<sup>358</sup> In 2007, the Joint Board recommended including broadband service as a supported service under the High-Cost Program and proposed permitting states to use various methods to allocate available universal service funds for broadband projects to reach unserved areas, including funding broadband projects through a competitive bidding system designed to select the most efficient provider of such service.<sup>359</sup> The Commission declined to adopt the recommendations of the Joint Board.<sup>360</sup> In 2008, the Commission released a Further Notice seeking comment on ways to comprehensively reform the federal universal service fund.<sup>361</sup> For example, the Commission sought comment on requiring recipients of high-cost support to offer broadband Internet access service throughout their service areas.<sup>362</sup> In the *National Broadband Plan NOI*, the Commission also sought comment on universal service reform.<sup>363</sup>

138. Many commenters suggest that universal service should be used as a mechanism to ensure that broadband services are available in rural areas but these commenters disagree about the changes that should be made to the universal service programs.<sup>364</sup> While this Report is not intended to address the merits of each of these issues, I continue to support the need for comprehensive reform of the universal service fund. It is of great interest to Congress, consumers, industry, and the Commission, and it is time for universal service to meet the challenges of the 21st century—broadband deployment—just as it did the challenge of the 20th century: telephone service. And while there are a variety of ways to comprehensively reform the system, adding broadband to both the contribution and distribution sides of the ledger, eliminating the identical support rule, and conducting effective auditing and oversight, along with a Congressional change to include intrastate as well as interstate revenue as part of the fund, would accomplish a great deal in addressing the sustainability and integrity of the fund for the long term and promote broadband in the areas served by the fund.

### B. Network Openness

139. Legacy and next generation applications are converging on the communications platform we know as the Internet, and how this critical infrastructure is managed now and in the future will determine whether it remains an open platform for innovation. The positive externalities and network effects of ubiquitous broadband will not be realized if consumers are all constrained by careful bundling,

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<sup>358</sup> 47 U.S.C. § 254(c).

<sup>359</sup> *High-Cost Universal Service Support, Federal-State Joint Board on Universal Service*, WC Docket No. 05-337, CC Docket No. 96-45, Recommended Decision, 22 FCC Rcd 20477, 20488–89, para. 47 (Fed-State Jt. Bd. 2007).

<sup>360</sup> *November 2008 Further Notice* at paras. 30–37.

<sup>361</sup> *Id.* at para. 40, app. A, paras. 19–31, app. C, paras. 19–31.

<sup>362</sup> *Id.*

<sup>363</sup> For example, the Commission sought comment on: (1) “what modifications [to universal service], if any should be considered as part of a national broadband plan;” (2) each program’s “effectiveness and efficiency as a mechanism to help achieve national broadband goals;” (3) “[i]f broadband services become eligible to receive high-cost and low-income support, should we also require contributions to universal service from broadband providers;” and (4) how the programs can be modified “to encourage community broadband development.” *National Broadband Plan NOI* at paras. 39–41.

<sup>364</sup> See generally Embarq Comments; CTIA Comments; USA Coalition Comments; Benton Foundation Comments; and ALA Comments.

packaging, and discriminatory practices that whittle away the end-to-end structure of the public Internet. “Openness” is not just another bromide, but a principle we must tenaciously preserve.

140. The value of open networks is not a novel concept, but the Commission must act to ensure that the genius of the open Internet is not lost. Over the course of the Commission’s history, powerful network operators have argued that harm will result from any reduction in their absolute control over the network. For example, the Commission had to intervene in cases like *Carterphone* to allow even basic attachments to the telephone network that incumbents argued would compromise the entire network.<sup>365</sup> As broadband networks developed, the few companies that controlled the on-ramps to the Internet could interfere with and distort the development of technology, opportunities for entrepreneurship, and the choices available to consumers. As the Commission re-categorized telecommunications services as information services, this only amplified the potential for interference. Fortunately, the Commission adopted the *Internet Policy Statement* containing the basic rights of Internet end-users to access lawful content, run applications and services, connect devices to the network, and enjoy the benefits of competition.<sup>366</sup> While these protections have been critically important as a first step forward, another step is needed.

141. I have long advocated adopting a fifth principle of nondiscrimination. The principle would allow for reasonable network management but make crystal clear that the transformative power of the Internet is not to be limited by such techniques. The Commission also should establish a systematic, expeditious, case-by-case process for adjudicating claims of discrimination. Such a principle is particularly important in a rural context where a citizen may have only one option for broadband Internet access. We need to guarantee the openness of the Internet, and the Commission appropriately raised the question of how to do this in its *National Broadband Plan NOI*.<sup>367</sup>

### C. Spectrum Access

142. Wireless service will play a critical role in ensuring that broadband reaches rural areas. Because wireless infrastructure costs are frequently less significant than comparable wired broadband deployments, wireless broadband can be an efficient means of delivering both backhaul and “last-mile” access services in rural areas.<sup>368</sup> It can also enable mobility or portability. Consequently, wireless broadband service can offer cost-effective connectivity where no broadband exists, as well as complementary or competitive service where it does.<sup>369</sup>

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<sup>365</sup> *Use of the Carterfone Device in Message Toll Service*, Decision, 13 FCC 2d 420 (1968), *recon. denied*, 14 FCC 2d 571 (1968).

<sup>366</sup> *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities; Review of Regulatory Requirements for Incumbent LEC Broadband Telecommunications Services; Computer III Further Remand Proceedings; Bell Operating Company Provision of Enhanced Services; 1998 Biennial Regulatory Review – Review of Computer III and ONA Safeguards and Requirements; Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities Internet Over Cable Declaratory Ruling; Appropriate Regulatory Treatment for Broadband Access to the Internet Over Cable Facilities*, Policy Statement, 20 FCC Rcd 14986, 14987–88, para. 4 (2005).

<sup>367</sup> *National Broadband Plan NOI*.

<sup>368</sup> See WIRELESS BROADBAND ACCESS TASK FORCE, FCC, CONNECTED & ON THE GO 2 (2005), available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-256693A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-256693A1.pdf) (WIRELESS BROADBAND ACCESS TASK FORCE REPORT); see also APPALACHIAN REGIONAL COMM’N, EVALUATION OF THE APPALACHIAN REGIONAL COMMISSION’S TELECOMMUNICATIONS PROJECTS: 1994–2000, at v–vii (2003), [http://www.arc.gov/images/reports/telecomeval/telecom\\_eval.pdf](http://www.arc.gov/images/reports/telecomeval/telecom_eval.pdf) (discussing reducing infrastructure costs).

<sup>369</sup> See WIRELESS BROADBAND ACCESS TASK FORCE REPORT at 13–14; see also 2009 HIGH SPEED REPORT at 1 (explaining that information about subscribership to high-speed services, including advanced services, includes (continued...))

143. For a number of years, the Commission's spectrum policies have attempted to promote wireless broadband deployment in rural areas. These policies have included increasing spectrum availability in rural areas, and adopting licensing, technical, auction eligibility, bidding credit, and spectrum leasing rules that have sought to encourage wireless service in rural and Tribal areas.

144. *Spectrum Availability.* In recent years, the Commission has made available significant amounts of licensed spectrum that can be used to provide wireless broadband services.<sup>370</sup> The Commission's actions have included, among other things, an examination of public safety needs to develop a nationwide, interoperable wireless broadband public safety network in the 700 MHz Band.<sup>371</sup> In addition, unlicensed spectrum use is currently permitted in several spectrum bands.<sup>372</sup> Most recently, in November 2008, the Commission adopted rules allowing unlicensed radio transmitters to operate in the unused portions of the broadcast television spectrum, the so-called "TV white spaces."<sup>373</sup> The

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data concerning terrestrial wireless service providers, in addition to data concerning wireline telephone companies, cable system operators, and satellite service providers).

<sup>370</sup> For example, the Commission auctioned 90 megahertz of Advanced Wireless Service (AWS) spectrum in the 2 GHz band beginning in 2006 and 52 megahertz of commercial spectrum in the 700 MHz Band in 2008. In addition, beginning in 2002, the Commission also auctioned 18 megahertz of commercial spectrum in the Lower 700 MHz Band. See *Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands*, WT Docket No. 02-353, Report and Order, 18 FCC Rcd 25162 (2003) (*AWS-1 Service Rules Report and Order*), modified by *Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands*, WT Docket No. 02-353, Order on Reconsideration, 20 FCC Rcd 14058 (2005) (*AWS-1 Recon Order*); *700 MHz Report and Order*, 22 FCC Rcd 8064; *700 MHz Second Report and Order*, 22 FCC Rcd 15289; <http://wireless.fcc.gov/auctions/44/> (with links to later auctions of Lower 700 MHz Band licenses). In addition, beginning in 2004, the Commission restructured the 2.5 GHz Broadband Radio Service/Educational Broadband Service band plan and modified the rules for the use of that spectrum to enable the development and deployment of mobile broadband services, including WiMAX technologies. In restructuring the band plan, the Commission moved from interleaved spectrum to more cohesive, contiguous blocks of spectrum. See *Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands*, WT Docket No. 03-66, Report and Order and Further Notice of Proposed Rulemaking, 19 FCC Rcd 14165, 14270, 14271, 14272, paras. 281, 286 (2004); *Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands*, WT Docket No. 03-66, Third Memorandum Opinion and Order and Second Report and Order, 21 FCC Rcd 5606 (2006).

<sup>371</sup> As envisioned by the Commission, such a network would bring the promise of broadband to all public safety entities, including those in rural areas that may not otherwise have the resources or the ability to procure broadband capabilities for themselves. The Commission is continuing to examine opportunities to utilize the 700 MHz band to enhance the ability of the public safety community to gain access to a state of the art broadband network. See *Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band*, PS Docket No. 06-229, Ninth Notice of Proposed Rulemaking, 21 FCC Rcd 14837 (2006); Report and Order and Further Notice of Proposed Rulemaking, 22 FCC Rcd 8064 (2007); Second Report and Order, 22 FCC Rcd 15289 (2007); Second Further Notice of Proposed Rulemaking, 23 FCC Rcd 8047 (2008); Third Further Notice of Proposed Rulemaking, 23 FCC Rcd 14301 (2008).

<sup>372</sup> The spectrum most commonly used by unlicensed devices in the United States is at 902-928 MHz, 2.4 GHz, and between 5.3 and 5.8 GHz. See generally 47 C.F.R. Part 15.

<sup>373</sup> *Unlicensed Operation in the TV Broadcast Bands*, ET Docket No. 04-186, Second Report and Order and Memorandum Opinion and Order, 23 FCC Rcd 16807 (2008). See *Sprint Nextel et al.* April 13, 2009 *Ex Parte* Letter at 1-2.

## REPORT ON A RURAL BROADBAND STRATEGY

Commission has also adopted an innovative, non-exclusive licensing scheme in the 3650-3700 MHz band that allows multiple entrants to use the band simultaneously.<sup>374</sup>

145. *Technical Rules.* In addition to increasing the amount of spectrum available for wireless broadband services, the Commission has also revised its technical rules for certain spectrum bands to improve wireless coverage in rural areas.<sup>375</sup> For instance, the Commission permits Cellular, Broadband Personal Communications Service (PCS), AWS, and certain 700 MHz licensees to employ twice the power in rural areas than is permitted in non-rural areas.<sup>376</sup> In addition, the Commission has allowed licensees in several bands to use a power spectral density model to measure power levels,<sup>377</sup> and has adopted “average” rather than “peak” measurements of power limits, which enables better services in rural areas through an ability to use increased power in most instances.<sup>378</sup>

146. *Service and Licensing Rules.* The Commission, in recent years, has adopted rules governing auctioned spectrum licenses that are meant to encourage broadband deployment in rural areas. These policies have included adopting smaller license sizes when creating band plans and more stringent buildout requirements for licensees.<sup>379</sup> Furthermore, the Commission has provided wireless licensees with the flexibility to deploy the technologies and services that best fit their business plan and meet the

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<sup>374</sup> See *Wireless Operations in the 3650-3700 MHz Band; Rules for Wireless Broadband Services in the 3650-3700 MHz Band; Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band; Amendment of the Commission’s Rules with Regard to the 3650-3700 MHz Government Transfer Band*, ET Docket Nos. 04-151, 98-237, 02-380, WT Docket No. 05-96, Report and Order and Memorandum Opinion and Order, 20 FCC Rcd 6502 (2005), *recon. granted in part*, Memorandum Opinion and Order, 22 FCC Rcd 10421 (2007) (*3650 Memorandum Opinion and Order*). See API Comments at 7 (stating the Commission’s recent decision regarding the 3650-3700 MHz Band is a commendable example of efficient management in a new band with registration conditions placed on licensees in that band and the accompanying protocol restrictions helping to ensure the viability of that band to multiple users in the future). The rules for this band provide for nationwide, non-exclusive, licensing of terrestrial wireless operations, and licensees must use equipment with a contention-based protocol. See *3650 Memorandum Opinion and Order*, 22 FCC Rcd at 10425, para. 11. This approach combines the benefits of the unlicensed approach, in which the number of wireless services providers is not restricted, with other elements, namely that service providers in the band must register their operations and use equipment that incorporates a contention-based protocol.

<sup>375</sup> In the *Terrestrial Wireless Rural Report and Order*, the Commission found that the record supported finding, in principle, that “increasing power limits in rural areas can benefit consumers in rural areas by reducing the costs of infrastructure and otherwise making the provision of spectrum-based services to rural areas more economic.” *Terrestrial Wireless Rural Report and Order*, 19 FCC Rcd at 19126-27, para. 86.

<sup>376</sup> See *id.* at 19126–35 paras. 86–104; *700 MHz Report and Order*, 22 FCC Rcd at 8099–100, para. 93.

<sup>377</sup> In deciding to employ the use of power spectral density (PSD) in the 700 MHz band, the Commission adopted a general power limit of 1 kW/MHz ERP for 700 MHz base stations and a 2 kW/MHz ERP limit for 700 MHz base stations operating in rural areas. *Id.* In March 2008, the Commission extended the PSD model to the Broadband PCS and AWS-1 spectrum bands, thereby adopting a power limit of 1640 Watts EIRP/MHz in non-rural areas and 3280 Watts EIRP/MHz in rural areas. See *Biennial Regulatory Review—Amendment of Parts 1, 22, 24, 27, and 90 to Streamline and Harmonize Various Rules Affecting Wireless Radio Services*, Third Report and Order, 23 FCC Rcd 5319, 5330, para. 25 (2008) (*Streamlining and Harmonization Order*).

<sup>378</sup> See *700 MHz Report and Order*, 22 FCC Rcd at 8103, para. 105; *Streamlining and Harmonization Order*, 23 FCC Rcd at 5330, para. 25.

<sup>379</sup> For example, in the AWS-1 Spectrum, the Commission increased the amount of spectrum licensed on a small geographic area basis (CMAs). See *AWS-1 Recon Order*, 20 FCC Rcd 14058. In addition, in the 700 MHz Band, the Commission adopted “keep-what-you-use” rules which provide that if a licensee fails to meet its end of term benchmark, its authorization to operate will terminate automatically for those geographic areas of its license authorization in which it is not providing service, and those unserved areas will become available for reassignment. See *700 MHz Second Report and Order*, 22 FCC Rcd at 15353–54, paras. 170–74.

needs of consumers.<sup>380</sup> The Commission's rules permit licensees to transfer their licenses, or partition or disaggregate their licenses, in the secondary market with Commission approval.<sup>381</sup> The Commission's secondary markets rules also provide flexibility to a wide array of wireless licensees, including broadband providers, to enter into spectrum leasing arrangements with other providers that seek access to spectrum in rural areas.<sup>382</sup>

147. *Bidding Credits.* To provide greater incentives for certain entities—including small rural telephone companies and small businesses that may have an interest in serving rural areas—to access spectrum, the Commission has offered bidding credits to such companies at spectrum auctions.<sup>383</sup> In doing so, the Commission has recognized that bidding preferences provide these smaller companies with an opportunity to compete successfully against large, well-financed entities at auction, and in some cases to subsequently deploy wireless service in rural areas.<sup>384</sup>

148. *Tribal Land Bidding Credits.* In 2000, the Commission created Tribal Land bidding credits to assist Tribal communities with the greatest need for access to telecommunications service.<sup>385</sup> The bidding credits are available to winning bidders in wireless spectrum auctions that agree to deploy facilities and provide service in certain Tribal areas,<sup>386</sup> namely federally-recognized Tribal areas with

<sup>380</sup> These policies have led to the development and deployment of cutting-edge mobile broadband network technologies in many areas of the country, as well as innovative, powerful, and personalized mobile broadband applications and devices. See generally *Thirteenth CMRS Competition Report*, paras. 66–67, 126–27.

<sup>381</sup> “Partitioning” a license refers to transferring a portion of the geographic area of a spectrum license, such as a county within a Cellular Market Area (CMA), to another entity. “Disaggregation” refers to transferring a portion of the spectrum included in a license, such as 10 megahertz of a 30 megahertz license, to another entity.

<sup>382</sup> See generally *Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets*, First Report and Order and Further Notice of Proposed Rulemaking, 18 FCC Rcd 20604 (2003); *Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets*, Second Report and Order, Order on Reconsideration, and Second Further Notice of Proposed Rulemaking, 19 FCC Rcd 17503 (2004); 47 CFR §§ 1.9001 *et seq.*

<sup>383</sup> The Commission may provide rural telephone companies that qualify as small businesses with bidding credits. See *Amendment of Part 1 of the Commission's Rules—Competitive Bidding Procedures*, WT Docket No. 97-82, Order on Reconsideration of the Third Report and Order, Fifth Report and Order, and Fourth Further Notice of Proposed Rule Making, 15 FCC Rcd 15293, 15319–20, para. 52 (2000).

<sup>384</sup> See, e.g., *Revision of Part 22 and Part 90 of the Commission's Rules to Facilitate Future Development of Paging Systems; Implementation of Section 309(j) of the Communications Act -- Competitive Bidding*, WT Docket No. 96-18, PR Docket No. 93-253, Memorandum Opinion and Order on Reconsideration and Third Report and Order, 14 FCC Rcd 10030, 10091, para. 112 (1999). But see also David Mason Comments at 2 (urging the Commission to allow licensing of WiMAX spectrum to small ISPs across the nation for free -- instead of auctioning spectrum to one large nationwide service provider who bids the most -- because a single nationwide provider of service will never get to his small town since the market is too small).

<sup>385</sup> *Extending Wireless Telecommunications Services to Tribal Lands*, WT Docket No. 99-266, Report and Order and Further Notice of Proposed Rulemaking, 15 FCC Rcd at 11794, 11802, para. 22 (2000) (*TLBC First Report and Order*).

<sup>386</sup> In order to obtain a bidding credit in a particular market, a winning bidder must indicate on its long-form application (FCC Form 601) that it intends to serve Tribal lands in that market. *Id.* at 11805, para. 31. Following the long-form application filing deadline, the applicant provided an additional 90 calendar days beyond the deadline to amend its application to identify the Tribal lands to be served, and provide certification from the Tribal government(s). In particular, applicants must provide certification from the applicable Tribal government that: (1) it will allow the bidder to site facilities and provide service on its Tribal Land(s), in accordance with our rules; (2) it has not and will not enter into an exclusive contract with the applicant precluding entry by other carriers, and will not unreasonably discriminate against any carrier; and (3) its Tribal Land is a qualifying Tribal Land as defined in Commission rules. In addition, at the conclusion of the grace period, the applicant was required to amend its long-

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telephone penetration rates equal to or less than 85 percent.<sup>387</sup> In order to ensure that applicants awarded bidding credits actually deploy facilities and provide service to Tribal lands, the Commission requires that a licensee construct and operate its system to cover 75 percent of the population of the qualifying Tribal Land within three years of the grant of the license or face repayment penalties and, potentially, license termination.<sup>388</sup>

149. Despite the various efforts of the Commission to promote spectrum access in rural areas, as described above, commenters have noted that these policies have not been consistently successful in promoting rural broadband deployments. In particular, parties have noted that there remains a lack of available, affordable, and suitable spectrum for rural wireless broadband;<sup>389</sup> that our secondary market rules do not always promote spectrum trading and re-use;<sup>390</sup> and that backhaul costs between wireless

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form application to file a certification that it would comply with the bidding credit buildout requirement, and that it would consult with the Tribal government regarding the siting of facilities and deployment of service on the Tribal Land. *Id.* at 11805–06, para. 32. The Commission, on its own motion, subsequently extended the grace period to 180 days. A winning bidder now has 180 days to amend its long-form application to identify the Tribal Land it seeks to serve, and to provide the required certification from the Tribal government. The winning bidder also has 180 days to file a certification that it will comply with the Tribal lands buildout requirements, and consult with the Tribal government regarding the siting of facilities and deployment of service on Tribal lands. *See Extending Wireless Telecommunications Services to Tribal Lands*, WT Docket No. 99-266, Second Report and Order and Second Further Notice of Proposed Rulemaking, 18 FCC Rcd 4775, 4779 para. 10 (2003) (*TLBC Second Report and Order*); *see also* 47 C.F.R. § 1.2110(f)(3)(ii)(A) (2003).

<sup>387</sup> *Extending Wireless Telecommunications Services to Tribal Lands*, WT Docket No. 99-266, Third Report and Order, 19 FCC Rcd 17552, 17659, para. 18 (2004) (*TLBC Third Report and Order*).

<sup>388</sup> *TLBC First Report and Order*, 15 FCC Rcd at 11,806–07, para. 35. The Commission also requires that, at the conclusion of the three-year period, licensees file a notification of construction indicating that they have met the 75% construction requirement on the Tribal lands for which the credit was awarded. If the licensee fails to comply with any condition, it is required to repay the bidding credit plus interest 30 days after the conclusion of the construction period. In the event the licensee fails to repay the amount, the license automatically cancels. *Id.* at 11807, para. 37. Additionally, in order to verify compliance with the Tribal lands construction requirement, the Commission requires licensees to file an attachment along with their notification of construction, stating that it covers 75% of the population of the Tribal area for which the credit was awarded and providing the data to support that statement. *TLBC Second Report and Order*, 18 FCC Rcd at 4780, para.13. Finally, the Commission expressly codified penalties for failure to comply with buildout requirements, and failure to timely repay the bidding credit. *Id.* at 4781, para. 14; *see also* 47 C.F.R. § 1.2110(f)(3)(vii) (2003).

<sup>389</sup> DigitalBridge Comments at 4–6; *see also, e.g.,* FiberTower *et al.* Comments at 1–2 & app. (urging the Commission to expand the amount of licensed spectrum that can be used for wireless backhaul services).

<sup>390</sup> *See* API Comments at 5 (stating that secondary markets for suitable broadband spectrum are dysfunctional in that incentives for auction winners or spectrum lessors to lease, partition, or sublease spectrum in rural areas are not compelling).

points of presence are prohibitively high.<sup>391</sup> Commenters have also noted that further modifications to rules for power limits in rural areas would promote wireless broadband deployment in those areas.<sup>392</sup>

150. We recommend the Commission conduct a thorough inventory of the spectrum it has already licensed, examining how, why, and where it is used, and identifying distinct geographic areas where service has not been deployed or where the spectrum is being used inefficiently. The Commission could then consider various ways to redeploy this spectrum for more efficient use, including possible modifications to secondary markets rules. For example, the Commission could examine whether requiring licensees to make “good faith” efforts to negotiate with potential spectrum lessees, particularly in rural areas, would promote the development of broadband service in rural markets.<sup>393</sup>

#### D. Middle Mile/Special Access

151. As discussed above, an ISP providing service to subscribers in a rural area must obtain connections to a node of an Internet backbone service provider.<sup>394</sup> The facilities making this connection are among those commonly referred to as “middle-mile” facilities. Many ISPs typically obtain access to these facilities by purchasing special access services from one or more incumbent LECs, wireless services providers, or other carriers. These services may be subject to tariffed rates or may be obtained pursuant to contract, depending upon the regulatory status of the provider.<sup>395</sup>

152. Certain commenters argue that the prices charged for access to middle-mile facilities are excessive.<sup>396</sup> In 2005, the Commission released the *Special Access Order and NPRM* to broadly reexamine the special access regime for price cap carriers.<sup>397</sup> The Commission asked parties to refresh

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<sup>391</sup> See, e.g., Big Think Strategies Comments at 8 (urging the Commission to consider the need for some sort of fixed, reasonable pricing on backhaul/middle mile costs to an upstream Internet access point); ACS Comments at 3 (stating that a component of broadband sustainability is actual access to the Internet based on economically available backhaul facilities); Fibertech/KDL Comments at 9 (stating that backhaul represents an enormous cost to wireless providers and can be prohibitively expensive in rural areas). We also note that roundtable participants at the March 19, 2009 NTIA/RUS Public Meeting about the Broadband Technology Opportunities Program explained that, in some areas, backhaul costs were the reason communities were unserved. See, e.g., John Rose, President of OPASTCO, Remarks at the U.S. Dep’t of Commerce Roundtable on Rural and Unserved Areas (Mar. 19, 2009) (transcript available at [http://www.ntia.doc.gov/broadbandgrants/090319/NTIA\\_031909\\_1445\\_1615\\_session.pdf](http://www.ntia.doc.gov/broadbandgrants/090319/NTIA_031909_1445_1615_session.pdf)).

<sup>392</sup> See, e.g., New America Foundation Comments at 3–5 (arguing that TV “whitespaces” rules should allow variable power limits for rural areas); WISPA Comments at 5 (stating that the Commission should be favorably disposed to quickly grant waiver requests seeking relief from power limits or other technical parameters in rural areas); and Main Street Broadband Comments at 2 (recommending that the Commission raise the power limits for 3.65 GHz operations in rural areas allowing service providers to reach more customers using less infrastructure).

<sup>393</sup> The Commission has noted the potential for a “good faith” negotiation process in recent spectrum rulemaking proceedings. See *Service Rules for Advanced Wireless Services in the 2155-2175 MHz Band*, WT Docket No. 07-195, Notice of Proposed Rulemaking, 22 FCC Rcd 17035, 17090 para. 131 (2007) (seeking comment on whether requiring licensees to make “good faith” efforts to negotiate with potential spectrum lessees could help increase access to spectrum, including in rural areas). Cf. *700 MHz Report and Order*, 22 FCC Rcd at 8086–87 paras. 53–54 (declining to adopt rules requiring licensees to make “good faith” efforts to negotiate based, in part, on other incentives under the rules to enter into spectrum leasing arrangements).

<sup>394</sup> See *supra* Part V.D (Addressing Network Costs).

<sup>395</sup> See generally 47 C.F.R. Parts 61, 69.

<sup>396</sup> See, e.g., New America Foundation Comments at 1, 5; GCI Comments at 3; and Alaska Commission Comments at 5.

<sup>397</sup> *Special Access Order and NPRM*, WC Docket No. 05-25, RM-10593, Order and Notice of Proposed Rulemaking, 20 FCC Rcd 1994, 1994, para. 1 (2005).

the record in this *Special Access Reform* proceeding in 2007.<sup>398</sup> Numerous price cap carriers have received relief from the price cap regime, in the form of pricing flexibility or forbearance relief, for certain special access services that could be used to provide middle-mile connectivity.<sup>399</sup> The issues raised in the *Special Access Reform* proceeding and the forbearance relief discussed above directly affect the rates that price cap carriers may charge for access to middle-mile and other dedicated facilities for various types of broadband providers. We recommend that the Commission consider the impact special access prices have on rural broadband deployment and affordability as a part of its overall review of special access rates in the *Special Access Reform* proceeding.

153. Some commenters suggest that wireless backhaul could provide a middle-mile alternative to wireline special access services in rural areas.<sup>400</sup> In its *Second Report and Order in the White Spaces* proceeding, the Commission determined that fixed unlicensed TV band devices (TVBDs) will be allowed to provide wireless broadband services (e.g., wireless Internet access) and other services using multiple vacant TV channels and will be permitted to operate on a fixed, point-to-point, or point-to-multipoint basis.<sup>401</sup> The Commission decided to limit fixed unlicensed TVBDs to a peak transmitter output power of one watt with a maximum antenna gain of 6 decibels isotropic (dBi) and require that transmitter power be reduced by the same amount in decibels (dB) that the maximum antenna gain exceeds 6 dBi, allowing fixed unlicensed TVBDs to operate with the equivalent of 4 watts Equivalent Isotropic Radiated Power (EIRP).<sup>402</sup> The Commission determined that these power levels would allow some improved coverage for wireless broadband service providers. The Commission also found that higher power levels would increase the risk of interference in congested areas and that it was prudent to set power limits at levels that would minimize the risk of interference to authorized TV band users. It was unclear that the current rules would provide for middle-mile coverage. However, recognizing that there are advantages, such as reduced infrastructure costs and increased service range, to operation of unlicensed TVBDs at even higher power levels, the Commission noted that it would further explore through a separate Notice of Inquiry whether higher powered unlicensed operation might be accommodated in the TV white spaces in rural areas.<sup>403</sup>

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<sup>398</sup> *Parties Asked to Refresh Record in the Special Access Notice of Proposed Rulemaking*, WC Docket No. 05-25, RM-10593, Public Notice, 22 FCC Rcd 13352 (2007).

<sup>399</sup> See, e.g., *Petition of AT&T Inc. for Forbearance under 47 U.S.C. § 160(c) from Title II and Computer Inquiry Rules with Respect to its Broadband Services*, WC Docket No. 06-125, Memorandum Opinion and Order, 22 FCC Rcd 18705 (2007); see also, e.g., *Joint Statement of Chairman Kevin J. Martin and Commissioner Deborah Taylor Tate, Petition of the Verizon Telephone Companies for Forbearance under 47 U.S.C. § 160(c) from Title II and Computer Inquiry Rules with Respect to their Broadband Services*, WC Docket No. 04-440 (Mar. 20, 2006) (discussing Verizon's "deemed granted" petition). Verizon's "deemed granted" petition was upheld in *Sprint Nextel Corp. v. FCC*, 508 F.3d 1129 (D.C. Cir. 2007).

<sup>400</sup> We note, however, that unfavorable weather conditions such as rain and wind can adversely affect the capacity of these transmissions for wireless backhaul using certain spectrum bands (such as 24 GHz and 39 GHz). See FCC Bulletin 70, *Millimeter Wave Propagation Spectrum Management Implications* (July 1997). In areas with irregular terrain, intermediate repeaters that ensure "line-of-sight" connectivity between transmitters and receivers are an indispensable part of any wireless backhaul system. See *supra* Part V.A (discussing technological considerations).

<sup>401</sup> *Unlicensed Operation in the TV Broadcast Bands: Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band*, ET Docket Nos. 04-186, 02-380, *Second Report and Order and Memorandum Opinion and Order*, 23 FCC Rcd 16807, 16847, paras. 104-05 (2008).

<sup>402</sup> *Id.* at para. 105.

<sup>403</sup> *Id.* at para. 106. See also Statement of Commissioner Michael J. Copps, *id.* at 16928; Statement of Commissioner Jonathan S. Adelstein, *id.* at 16930; Statement of Commissioner Robert M. McDowell, *id.* at 16932; and Statement of Commissioner Deborah Taylor Tate, *id.* at 16935; see also Fibertech/KDL Comments at 9 (asserting that wireless backhaul can reduce cellular companies' special access costs by 90%). See generally *Sprint Nextel et al.* April 13, 2009 *Ex Parte* Letter.

154. We recommend that the Commission consider additional actions to address middle-mile connectivity as it analyzes the records being developed in open proceedings at the Commission.

**E. Intercarrier Compensation**

155. Interconnection arrangements between carriers are currently governed by a complex system of intercarrier compensation regimes. Critics of the existing regimes argue that they create regulatory arbitrage opportunities that distort the marketplace and impede the deployment of broadband facilities.<sup>404</sup> The Commission's efforts to develop a more unified intercarrier compensation regime began in 2001, with the release of the *Intercarrier Compensation NPRM*.<sup>405</sup> These efforts have included a *Further NPRM*,<sup>406</sup> additional rounds of comments,<sup>407</sup> and, most recently, efforts to adopt a comprehensive approach to universal service and intercarrier compensation reform.<sup>408</sup> The record assembled on comprehensive reform is extensive, the issues are difficult, and agreement on solutions has proven elusive. We believe a critical factor in evaluating any specific set of proposed reforms should be the effect they will have on the deployment of broadband services in rural areas.

**F. Access to Poles and Rights of Way**

156. Congress first directed the Commission to ensure that the rates, terms, and conditions for pole attachments by cable television systems are just and reasonable in 1978 when it added section 224 to the Communications Act.<sup>409</sup> The 1996 Act expanded the reach of section 224 to grant attachers an affirmative right to access utility poles.<sup>410</sup> Congress also added "telecommunications carrier" as a category of attacher.<sup>411</sup> The 1996 Act specified separate rate formulas for cable operators and telecommunications carriers,<sup>412</sup> and permitted electric utilities to deny access, on a nondiscriminatory basis, where there is insufficient capacity and for reasons of safety, reliability, and generally applicable engineering purposes.<sup>413</sup> When the Commission implemented section 224's new access provision,<sup>414</sup> it

<sup>404</sup> *November 2008 Further Notice* at paras. 3, 23–28.

<sup>405</sup> *Developing a Unified Intercarrier Compensation Regime*, CC Docket No. 01-92, Notice of Proposed Rulemaking, 16 FCC Rcd 9610 (2001) (*Intercarrier Compensation NPRM*).

<sup>406</sup> *Developing a United Intercarrier Compensation Regime*, CC Docket No. 01-92, Further Notice of Proposed Rulemaking, 20 FCC Rcd 4685 (2005) (*Intercarrier Compensation Further NPRM*) (seeking comment on a number of specific comprehensive reform proposals and alternative reform measures that would affect how intercarrier costs are recovered from end-users, carriers and universal service mechanisms).

<sup>407</sup> *Comment Sought on Amendments to the Missoula Plan Intercarrier Compensation Proposal to Incorporate a Federal Benchmark Mechanism*, CC Docket No. 01-92, Public Notice, 22 FCC Rcd 3362 (WCB 2007). *Comment Sought on Missoula Intercarrier Compensation Reform Plan*, CC Docket No. 01-92, Public Notice, 21 FCC Rcd 8524 (WCB 2006).

<sup>408</sup> *November 2008 Further Notice*.

<sup>409</sup> Pole Attachment Act of 1978, Pub. L. No. 95-234, 92 Stat. 33 (1978).

<sup>410</sup> Before 1996, section 224 did not guarantee cable television systems the right to attach to utility poles but merely provided that where cable television systems were able to obtain such attachments, the rates, terms, and conditions must be just and reasonable.

<sup>411</sup> 47 U.S.C. § 224(a)(4).

<sup>412</sup> See 47 U.S.C. § 224(d), (e).

<sup>413</sup> 47 U.S.C. § 224(f)(2).

<sup>414</sup> *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996; Interconnection between Local Exchange Carriers and Commercial Mobile Radio Service Providers*, CC Docket Nos. 96-98, 95-

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adopted a few broad policy guidelines and rules of general applicability, but concluded that the reasonableness of particular conditions of access imposed by a utility should be resolved on a case-specific basis.<sup>415</sup>

157. In 2007 the Commission issued the *Pole Attachments NPRM* to comprehensively review these issues.<sup>416</sup> In the *Pole Attachments NPRM*, the Commission tentatively concluded that all attachments used to provide broadband Internet access services should be subject to a single rate formula, regardless of the kind of company (*e.g.*, cable operator, telecommunications carrier) providing those services.<sup>417</sup> In the pending *Pole Attachments NPRM* proceeding, the Commission also sought comment on the interplay between section 224 pole attachment regulation and Congress's intention in section 706 to promote broadband infrastructure deployment.<sup>418</sup> Timely and reasonably priced access to poles and rights of way is critical to the buildout of broadband infrastructure in rural areas. We recommend that the Commission consider this factor in analyzing the record in the *Pole Attachments NPRM* proceeding.

### G. Tower Siting

158. Wireless broadband development in rural areas will depend in part on the ability of providers to access towers and other structures for the deployment of their network facilities, either through new tower construction or collocation on existing towers or other structures. For instance, one study concludes that, in order to achieve ubiquitous mobile broadband coverage, approximately 16,000 new towers will need to be constructed, disproportionately in rural areas.<sup>419</sup> We note that there are several open Commission proceedings that may affect the pace or cost of tower construction.<sup>420</sup>

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185, First Report and Order, 11 FCC Rcd 15449, 16058–107, paras. 1119–240 (1996) (*Local Competition Order*) (Part XI.B. “Access to Rights of Way”).

<sup>415</sup> *Id.* at 16067–68, para. 1143. See generally 47 C.F.R. §§ 1.1403–.1418 (section 224 complaint rules). In addition, under current Commission rules, an attacher may execute a pole attachment agreement with a utility, and then later file a complaint challenging the lawfulness of a provision of that agreement. See, *e.g.*, *S. Co. Svcs., Inc. v. FCC*, 313 F.3d 574, 582–84 (D.C. Cir. 2002).

<sup>416</sup> *Implementation of Section 224 of the Act; Amendment of the Commission's Rules and Policies Governing Pole Attachments*, WC Docket No. 07-245, RM-11293, RM-11303, Notice of Proposed Rulemaking, 22 FCC Rcd 20195 (2007) (*Pole Attachments NPRM*).

<sup>417</sup> See *Pole Attachments NPRM*, 22 FCC Rcd at 20209, para. 36. In the *Pole Attachments NPRM*, the Commission also tentatively concluded that this broadband rate should fall within the established statutory rates. See 47 U.S.C. § 224(d)–(e).

<sup>418</sup> See *Pole Attachments NPRM*, 22 FCC Rcd at 20205–06, para. 25. The Commission stated that “[s]ection 706 of the 1996 Act directs us to promote the deployment of broadband infrastructure, and this directive leads us to separate out those pole attachments that are used to offer broadband Internet access service from those used for other services.” *Id.* at 20209, para. 36.

<sup>419</sup> See CTIA Comments, WC Docket No. 05-337, Attach. A at 20 (filed Apr. 17, 2008) (“States with lower population density require more new site investment rather than augmentation of existing network assets. More than 90% of the estimated investment for Alaska, Idaho, Montana, Nevada, and Wyoming is Greenfield or new site investment.”).

<sup>420</sup> For instance, in July 2008, CTIA filed a petition for declaratory ruling requesting that the Commission clarify provisions of the Communications Act regarding state and local review of wireless facility siting applications. *Petition for Declaratory Ruling to Clarify Provisions of Section 332(c)(7)(B) to Ensure Timely Siting Review and to Preempt under Section 253 State and Local Ordinances that Classify All Wireless Siting Proposals as Requiring a Variance*, Petition for Declaratory Ruling, WT Docket No. 08-165 (filed July 11, 2008). In 2006, the Commission sought comment on whether it should impose additional requirements on the construction of new communications towers to reduce the number of migratory bird collisions with such towers. *Effects of Communications Towers on*

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