Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matters of	
International Comparisons and Consumer Survey Requirements in the Broadband Data Improvement Act	GN Docket No. 09-47
A National Broadband Plan for Our Future	GN Docket No. 09-51
Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act	GN Docket No. 09-137

COMMENTS OF GENERAL COMMUNICATION, INC. – NBP PUBLIC NOTICE # 5

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SUMMARY

As the leading provider of broadband services to government, commercial, and residential users in Alaska, General Communication, Inc. ("GCI") understands the significant barriers to broadband deployment to tribal lands. The Commission has committed to taking the extra steps, where necessary, to address the needs of consumers on tribal lands, those least likely to have adequate access to telecommunications services. But there is more work to be done.

Because of its unique history, all of Alaska falls within the Commission's definition of tribal lands, which corresponds with the wide dispersal of the Alaska Native population in rural and urban communities. The broadband service challenges in the State are comparable. Alaska's vast distances, widely dispersed population, severe climate, and difficult terrain hamper deployment of broadband communications, which can serve as a lifeline to basic commerce and essential public services. Making access to broadband even more difficult, most remote areas of Alaska depend on satellite technology to transport traffic across the middle mile. A key challenge in improving broadband for Alaska's tribal lands is therefore to replace satellite middle-mile transport with technologically and economically viable terrestrial middle-mile delivery, both within these remote regions and between these regions and the Internet backbone. GCI is committed to using private capital to deploy modern broadband service over time to as much of these sparsely inhabited regions as possible on an economically feasible and sustainable basis. It is clear, however, that the economic viability of deploying terrestrial second/middle-mile facilities over the next five to ten years will depend at least in part on

government-backed capital, sustained support programs to anchor tenants, and the addition of broadband to Lifeline-supported services.

Statewide, high-cost universal support, for example, must continue to buttress basic telecommunications infrastructure, which in turn will provide local delivery of broadband services once adequate middle-facilities are deployed. Moreover, the E-Rate and Rural Health Care programs have not only improved education and health care services to communities throughout the state, but have also provided the necessary digital literacy tools and training that help residents understand and effectively avail themselves of the benefits that broadband can provide. While broadband infrastructure in Alaska's cities is relatively robust, efficient, and priced comparably to lower-48 services, affordability remains an issue, as illustrated by relatively high level of Lifeline-qualified consumers in the State. Accordingly, the Commission should establish a targeted Lifeline program for broadband, like the Tier 4 program.

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INTRODUCTION

As the leading provider of broadband services to government, commercial, and residential users in Alaska, General Communication, Inc. ("GCI") understands the significant barriers to broadband deployment to tribal lands.[1] Alaska's vast distances,

[1] The Public Notice unnecessarily uses a multiplicity of definitions to discuss "Tribal lands," "Indian Country," and "Tribal areas." Comment Sought on Broadband Deployment and Adoption on Tribal Lands at 2, Public Notice, GN Docket Nos. 09-47, 09-51, and 09-137 (rel. Sept. 23, 2009) ("*Tribal Lands Public Notice*"). Part 54.400(e) of the Commission's rules already defines "Tribal lands" as "any federally recognized Indian tribe's reservation, pueblo, or colony, including former reservations in Oklahoma, Alaska Native regions established pursuant to the Alaska Native Claims Settlement Act, and Indian allotments." 47 C.F.R. § 54.400(e). Because of historical differences between the treatment of Native Americans in the lower 48 and in Alaska, and the enactment of the Alaska Native Claims Settlement

widely dispersed population, severe climate, and difficult terrain make broadband communications a lifeline across the state, including rural and remote populations and Alaska Natives. Covering 586,412 square miles,[2] Alaska is by far the largest state in the Union, twice as big as Texas and four times the size of California. But with a population of only 686,293 people,[3] Alaska also has the lowest population density in the nation, at only 1.17 people per square mile. Moreover, the highway system is limited; many villages are accessible only by air or water. Even Alaska's three largest communities are small by national standards. Anchorage has only approximately 365,000 people, ranking 137th nationally; Fairbanks has 98,000, ranking 344th; and Juneau has only 39,000, ranking it 816th out of the 953 metropolitan and micropolitan statistical areas.[4]

In the most remote reaches of the state, many residents subsist largely on hunting, gathering, and fishing activities. This is partly a cultural choice, as the subsistence lifestyle is central to many rural Alaskans' sense of self and place. Subsistence living, however, is also an economic necessity as there are very few year-round jobs in rural

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Act ("ANCSA"), tribal lands have not been, and should not be, defined for Alaska other than with reference to the ANCSA's Alaska Native regions.

[2] Alaska Office of Economic Development, Geography of Alaska, http://www.commerce.state.ak.us/oed/student_info/learn/aboutgeography.htm.

[3] U.S. Census Bureau, State & County QuickFacts, http://quickfacts.census.gov/qfd/states/02000.html.

[4] Office of Management and Budget, Executive Office of the President, OMB Bull. No. 09-01, Update of Statistical Area Definitions and Guidance on Their Uses (2008), *available at* http://www.whitehouse.gov/OMB/bulletins/fy2009/09-01.pdf (listing, but not ranking, the metropolitan and micropolitan statistical areas) ("OMB Bull. No. 09-01"); *see also* U.S. Census Bureau, Cumulative Estimates of Population Change for Metropolitan and Statistical Areas and Rankings: April 1, 2000 to July 1, 2008, http://www.census.gov/popest/metro/CBSA-est2008-pop-chg.html ("Census Metropolitan Rankings"); Cumulative Estimates of Population Change for Micropolitan Statistical Areas and Rankings: April 1, 2000 to July 1, 2008, http://www.census.gov/popest/metro/CBSA-est2008-pop-chg.html ("Census Micropolital Rankings").

Alaska. Most jobs in these areas are seasonal and associated with commercial fishing or other activities that are confined only to the few summer months, thereby severely limiting potential income. The rates of unemployment and underemployment have always been in double digits in rural Alaska. The inability to earn adequate income in economically isolated communities, while retaining the strong cultural identity associated with those communities is believed to have contributed to a higher than average suicide rate among young people living in rural villages. Improved broadband communications can not only increase income potential, but can also provide access to needed mental health services. Where they can, rural residents already rely on telecommunications for basic commerce and essential public services such as healthcare and education. As discussed below, broadband services to schools and rural health clinics and hospitals – supported by the E-Rate and Rural Health Care Programs – have vastly improved educational services and provided life-saving and health-improving medical care in areas where there are no specialized teachers and a doctor is often an expensive, and sometimes impossible, plane flight away.

The same conditions that heighten the need for broadband communications to connect remote villages to the world also hamper broadband deployment efforts. As GCI laid out in detail in response to Public Notice #11, some communities are on the road network, while others are hundreds of miles from the nearest road. Most of these communities beyond the road network lack even the basic communications infrastructure present in the lower 48. Modern digital cellular phone networks, for instance, are just

now coming to much of Alaska.[5] Moreover, the information infrastructure to serve these small communities necessarily relies on the statewide network for critical functions, such as the Home Location Register, which serves the state from Anchorage. With access to high-cost universal service support, GCI has been able to deploy a statewide, wireless end-user network, which will be critical to delivering statewide broadband. But first, the middle-mile issue must be solved for Alaska.

As a result of the State's unique geography and topography, most Alaskans outside of the road network depend on satellite technology to transport traffic across the middle mile. But satellite service is expensive, has limited throughput capacity and inherent latency and, thus, is not a suitable option for widespread, intensely used broadband services for the mass market. Satellite links simply cannot deliver economically feasible, urban-quality residential broadband Internet service. In addition, critical telehealth services, like telepsychiatry, rely on high-quality video requiring increasing levels of bandwidth, placing greater demands on capacity-constrained satellite connections. A key challenge in improving broadband for Alaska's tribal lands is, therefore, to replace satellite middle-mile transport with technologically and economically viable terrestrial middle-mile delivery, both within these remote, off-road regions and between these regions and the Internet backbone. Accordingly, GCI

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[5] *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services*, Thirteenth Report, 24 FCC Rcd 6185, 6358-59 (2009) (demonstrating the dearth of digital cellular coverage in most of Alaska) ("Thirteenth CMRS Competition Report").

welcomes the Commission's continuing recognition of not only the challenges, but also the importance, of bridging the broadband gap to Alaska's tribal lands.[6]

A. The Commission Has Recognized the Need to Address the Deficiencies in Communication Services to Tribal Lands.

The Commission has committed to taking the extra steps, where needed, to address the needs of consumers on tribal lands, those least likely to have adequate access to telecommunications services. In the *Twelfth Report and Order*, for example, the Commission sought to identify and remedy "the impediments to increased telecommunications deployment and subscribership in unserved and underserved regions of our Nation, including tribal lands and insular areas."[7] Based on the 1990 Census, the Commission reported that "although approximately 94 percent of all Americans have a telephone, only 47 percent of Indians on reservations and other tribal lands have a telephone" and that "Indians represent 89 percent of the Nation's population in the one hundred zip codes with the lowest subscribership levels."[8] These statistics demonstrated that the existing support mechanisms were "not adequate to sustain telephone

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[6] *Tribal Lands Public Notice* at 2 (seeking "comment on specific barriers to broadband deployment and adoption in Indian Country and how can they be reduced or eliminated") (citation omitted).

[7] *Federal-State Joint Board on Universal Service; Promoting Deployment and Subscribership in Unserved and Underserved Areas, Including Tribal and Insular Areas; Western Wireless Corporation, Crow Reservation in Montana; Smith Bagley, Inc.; Cheyenne River Sioux Tribe Telephone Authority; Western Wireless Corporation, Wyoming; Cellco Partnership d/b/a/ Bell Atlantic Mobile, Inc.; Petitions for Designation as an Eligible Telecommunications Carrier and for Related Waivers to Provide Universal Service*, Twelfth Report and Order, Memorandum Opinion and Order, and Further Notice of Proposed Rulemaking, 15 FCC Rcd 12208, 12211 ¶ 2 (2000) ("Twelfth Report and Order").

[8] *Id.*, 15 FCC Rcd at 12224 ¶ 26.

subscribership on tribal lands."[9] Accordingly, the Commission concluded that "[t]he extent to which telephone penetration levels fall below the national average on tribal lands" demanded "immediate Commission action to promote the deployment of telecommunications facilities in tribal areas and to provide the support necessary to increase subscribership in these areas."[10]

In response, the FCC created a number of programs targeted to residents of tribal lands to create "financial incentives for eligible telecommunications carriers to serve, and deploy telecommunications facilities in, areas that previously may have been regarded as high risk and unprofitable."[11] In particular, the FCC created a fourth tier of federal Lifeline support, which provided additional monetary support to eligible telecommunications carriers serving low-income individuals living on tribal lands.[12] The FCC also provided support to qualified individuals under the federal Link Up program to reduce the initial connection charges for low-income subscribers on tribal lands.[13]

The Commission echoed these actions in a simultaneous order on *Extending Wireless Telecommunications Services to Tribal Lands*.[14] As the Commission again explained, "[b]y virtually any measure, communities on tribal lands have historically had less access to telecommunications services than any other segment of the population."[15]

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[9] *Id.*, 15 FCC Rcd at 12212 ¶ 2.

[10] *Id.*, 15 FCC Rcd at 12213 ¶ 5.

[11] *Id*.

[12] *Id.*, 15 FCC Rcd at 12230-38 ¶¶ 42-58.

[13] *Id.*, 15 FCC Rcd at 12238-42 ¶¶ 59-63.

[14] *Extending Wireless Telecommunications Services To Tribal Lands*, Report and Order and Further Notice of Proposed Rulemaking, 15 FCC Rcd 11794 (2000) ("*Extending Wireless Telecommunications Services To Tribal Lands*").

[15] *Id.*, 15 FCC Rcd at 11798.

This is certainly true with respect to digital wireless services in Alaska. The FCC's CMRS Competition Reports show that huge portions of Alaska have been unserved[16] – a situation which GCI is beginning to change with its statewide wireless build-out. For these types of geographically isolated areas, the Commission recognized that the most efficient provision of basic telephone service could "involve the use of a terrestrial wireless technology, a satellite technology, or a combination of these technologies."[17] Accordingly, the Commission also established bidding credits for auction winners who use licenses to provide services on traditionally underserved tribal lands.[18]

In 2008, the Commission also adopted an exception to the interim cap on high-cost universal service support for competitive eligible telecommunications carriers that serve tribal lands, including Alaska Native regions. "Because many tribal lands have low penetration rates for basic telephone service," the Commission did "not believe that competitive ETCs are merely providing complementary services in most tribal lands, as they do generally."[19] In a separate statement, Commissioner Copps noted the importance of the tribal lands exclusions, stating that tribal lands "are among the most underserved when it comes to telecommunications—both basic phone service and broadband," and that "[t]he Commission must continue to focus on ways to bring affordable services to

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[16] Thirteenth CMRS Competition Report, 24 FCC Rcd at 6358-59 (demonstrating the dearth of digital cellular coverage in most of Alaska).

[17] *Extending Wireless Telecommunications Services to Tribal Lands*, 15 FCC Rcd at 11799.

[18] *Id.*, 15 FCC Rcd at 11796.

[19] *High-Cost Universal Service Support; Federal-State Joint Board on Universal Service; Alltel Communications, Inc., et al. Petitions for Designation as Eligible Telecommunications Carriers; RCC Minnesota, Inc. and RCC Atlantic, Inc. New Hampshire ETC Designation Amendment*, Order, 23 FCC Rcd 8834, 8848 ¶ 32 (2008) (citation omitted).

these areas as their residents are equally deserving of the benefits that technology affords."[20] Commissioner McDowell also supported the "exception for all of the providers serving tribal lands across the country, and Alaska Native lands – some of the most under-served parts of America," stating that "[t]his limited exception will ensure that companies operating in these remote areas will continue to receive high-cost support to provide their services while we move toward a permanent solution."[21]

Support for the basic infrastructure in these areas through existing voice-centric universal service mechanisms remains critical to deploying a network that serves all of Alaska. Without the support received through these mechanisms, whether high-cost, low income, E-Rate or telemedicine support, it would not be possible to bring modern services to rural Alaska, including modern digital wireless services and broadband.

B. All of Alaska Constitutes "Tribal Lands."

Because of its unique history, all of Alaska falls within the Commission's definition of "tribal lands." In 1971, Congress passed the Alaska Native Claims Settlement Act ("ANCSA"), which extinguished claims to tribal lands,[22] transferring title to twelve "regional corporations" that cover the entirety of the state and over 200 "village corporations." Tribal populations in the lower 48 are often located in discrete locations specifically designated as "Indian Country," or "trust land." In Alaska, however, the whole state is classified as tribal lands, which corresponds with the wide dispersal of the

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[20] Michael J. Copps, Commissioner, Federal Communications Commission, Dissenting Statement at 2, WC Docket No. 05-337 and CC Docket No. 96-45 (rel. May 1, 2008).

[21] Robert M. McDowell, Commissioner, Federal Communications Commission, Statement at 1, WC Docket No. 05-337 and CC Docket No. 96-45 (rel. May 1, 2008).

[22] Again, excepting the Annette Island Reserve of the Metlakatla Indian Community.

Alaska Native population in rural and urban communities. Indeed, over 40% of the Alaska Native population lives in the state's urban areas.

C. Broadband Access is Extremely Limited in Most of Alaska.

While many Alaskans live in urban communities on the road network, hundreds of communities and villages are located in rural and often extremely remote areas.[23] In the off-road communities, the population centers are tiny, with larger regional hubs like Barrow and Nome home to populations of only 4,000 and 3,500, respectively, and many isolated villages, such as Kupreanof, Kasaan, Bettles, and False Pass, having less than 50 residents. As discussed above, access to advanced broadband services remains extremely limited outside the road network. Even in regional centers where DSL or cable modem serve the last mile, the satellite-based middle-mile backhaul to Anchorage constrains end-to-end Internet speeds with any area outside of the region. Inter-regional Internet service in such areas is generally limited to approximately 56 kbps to 256 kbps.

Adequate broadband service is commonly available in Anchorage, Fairbanks, and Juneau – the largest markets in Alaska, but still smaller than Montgomery, Alabama; Peoria, Illinois; or Salem, Oregon[24] – at prices comparable to the lower 48. Affordability, however, remains a challenge. Alaska as a whole has a higher cost of living than the lower 48, as reflected in the Federal Poverty Guidelines.[25] Moreover, Alaska Natives in

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[23] S. Goldsmith et al., *The Status of Alaska Natives Report 2004* 2-1 (2004), *available at* http://www.iser.uaa.alaska.edu/Publications/aknativestatusch2.pdf ("Alaska Natives Report").

[24] *See* OMB Bull. No. 09-01; Census Metropolitan Rankings; Census Micropolitan Rankings.

[25] Department of Health and Human Services (HHS) Annual Update of the HHS Guidelines, 74 Fed. Reg. 4199 (Jan. 23, 2009) (showing a 25% higher poverty threshold for a family of four in Alaska than in the lower 48).

particular have lower average incomes across the state.[26] GCI has seen increasing reliance by subscribers on Lifeline service throughout Alaska. Moreover, statewide, high-cost universal service continues to support telecommunications infrastructure that can also be used to deliver local broadband services. The Commission's recognition of the need for continued universal service fund ("USF") support to tribal lands has been critical to the provision of services.

Again, GCI welcomes the Commission's persistence in attempting to resolve this entrenched problem and now responds to specific Commission questions.

I. BROADBAND DEPLOYMENT IN TRIBAL LANDS

Despite the challenges outlined above, GCI is committed to providing modern broadband service to as many of the sparsely inhabited, off-road Alaska regions as it can on an economically feasible and sustainable basis. A large part of that solution will come from building out the facilities required to move middle-mile traffic from satellite to terrestrial (microwave/fiber) means, thus allowing for higher capacity, more efficient service. As a start to this process, GCI operates, through its affiliate Unicom, Inc. ("Unicom"), DeltaNet, which is a terrestrial microwave second-mile network in the remote Yukon-Kuskokwim Delta ("Y-K Delta"). The DeltaNet project was financed largely by three loans/grants from the Rural Utilities Service's ("RUS") Distance Learning and Telemedicine Program. DeltaNet connects about 40 rural villages, including Eek (pop. 272), Tuntutuliak (pop. 417), and Quinhagak (pop. 661), to Bethel,

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[26] Alaska Natives Report at 4-62, *available at* http://www.iser.uaa.alaska.edu/Publications/aknativestatusch4.pdf (illustrating the difference between Native and Non-Native adult per capita income for urban areas as $21,925 and $32,505, respectively); *see also id*. at 4-32 (stating generally that "[n]ative income per household in 2000 was $43,175, or 66% of the non-Native average of $65,383," and that this gap "has not changed significantly since 1980").

the regional hub (pop. 5,665) via terrestrial microwave facilities.[27] Bethel, in turn, connects to Anchorage via satellite and from there to the Internet backbone by fiber.

The DeltaNet microwave network solves the technical, capacity, and bandwidth issues that hamper satellite service within the Bethel region (village-to-village and village-to-regional center). This network is particularly important for regional anchor tenants, such as rural healthcare providers and schools, as much of their telecom needs involve communication and resource sharing between their in-region facilities. For now, however, interregional communication from Bethel to Anchorage and the world remains anchored to the satellite middle mile, thus impeding high-speed, cost-effective consumer Internet service to Alaskans in rural and remote communities. GCI hopes to migrate most of its middle-mile traffic from satellite to hybrid microwave/fiber, including undersea cable systems, which are best suited, both technically and economically, to meet the challenges of the harsh Alaskan terrain. By expanding deployment of this technology over time, GCI will reduce its reliance on satellite for backhaul, providing a regional broadband service and a critical element of the middle-mile solution for Alaska.[28]

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[27] Alaska Division of Community and Regional Affairs, Alaska Department of Commerce, Community, and Economic Development, Alaska Community Database Community Information Summaries, http://www.commerce.state.ak.us/dca/commdb/CIS.cfm.

[28] Because of unavoidable technical and economic limitations of satellite service, however, GCI anticipates that the most geographically isolated villages in the Alaskan interior will remain connected by satellite for the foreseeable future. Transferring traffic from satellite to terrestrial facilities in the coastal population centers will free additional satellite capacity to improve service to those interior areas, but latency and bandwidth constraints will continue to be problems for satellite-served areas. As more traffic moves to terrestrial networks and continues to grow, and with more satellite capacity dedicated to specific, sparse routes, satellites will be less able to provide adequate capacity redundancy for outages. In that case, it is important that the terrestrial networks provide a measure of redundancy, such as through self-healing rings.

GCI also has a complementary vision, the TERRA project, for replicating the success of DeltaNet in four other regions up the western and northern coasts of Alaska and tying those regional networks to each other and the Internet backbone in Anchorage, thus delivering for the first time middle-mile terrestrial broadband service to villages in each of those five regions.[29] Figure 1 below depicts the potential deployment.

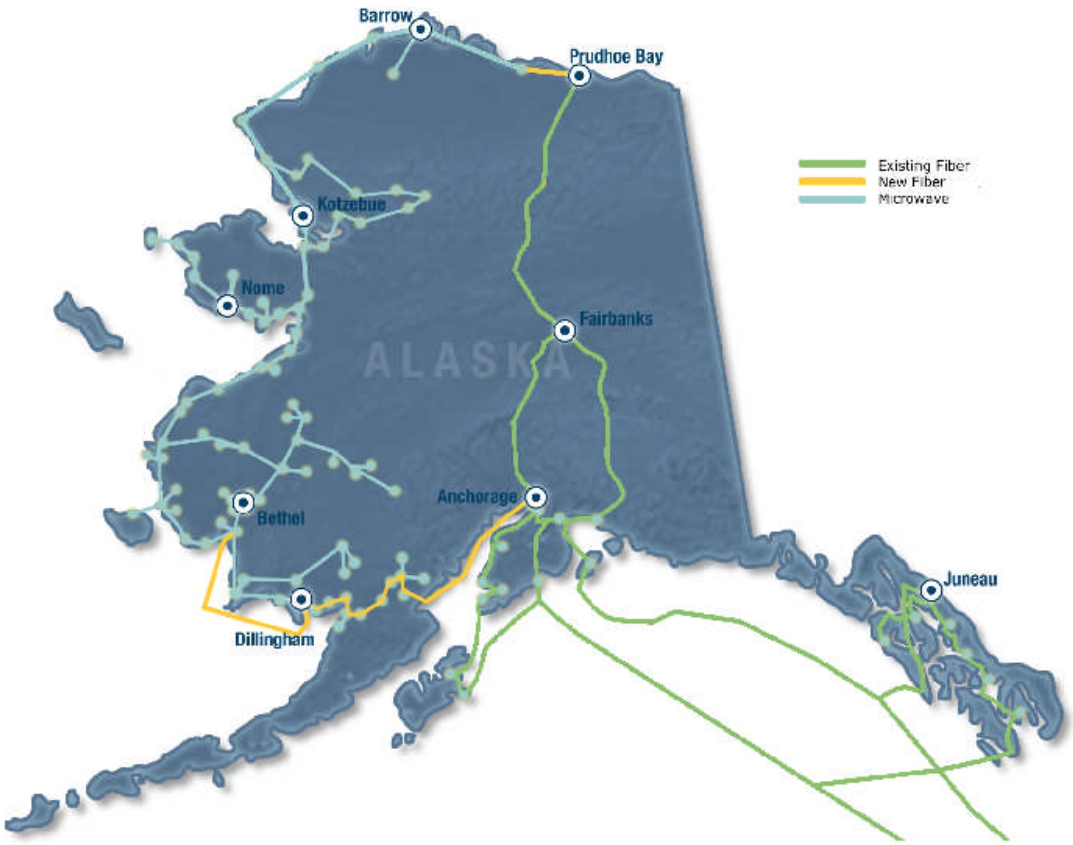

Figure 1

Each of these regional centers is home to organizations, such as Native rural health corporations and school districts, which are the critical anchor tenants necessary to support deploying terrestrial broadband infrastructure. The deployment of service to

[29] In addition to expansion in the Y-K Delta (Bethel), the TERRA project will likely include Bristol Bay (Dillingham), the North Slope (Barrow and Prudhoe Bay), Norton Sound (Nome), and the Northwest Arctic (Kotzebue) regions.

these anchor tenants in turn would support the infrastructure necessary to deliver mass market services, at least for second-mile, in-region facilities. The TERRA project would expand communications options for residents of this vast wilderness area, predominantly Yup'ik and Inupiat Eskimo Alaska Natives, thereby helping to preserve the Native culture and unique way of life by encouraging economic development in these regional centers and villages, thus allowing residents to obtain healthcare, education, and jobs, while continuing to live in their ancestral home and participate in traditional Native activities.

The business case for deploying the terrestrial middle-mile facilities necessary to link these regional networks to the Internet backbone in Anchorage is, however, more problematic. The revenue generated by anchor tenants alone is not adequate to justify the capital investment for the middle-mile facilities, and residential users in the region have a limited ability to pay for terrestrial broadband service. Solving this problem requires the continuation of the outside support components, such as RUS loan/grants and USF support that made DeltaNet possible and may require GCI to (i) identify lower-cost technical solutions, (ii) develop or find new middle-mile revenue streams, and/or (iii) find partners to help shoulder the deployment burden. GCI has engineered a plan to provide hybrid microwave/fiber middle-mile connectivity facilities from Bethel to Anchorage, and has applied for Broadband Initiatives Program/Broadband Technology Opportunities Program ("BIP/BTOP") funding through its wholly owned subsidiary, United Utilities, Inc., for a combination loan/grant to support this plan.

The Commission asks what specific actions it could take to facilitate greater coordination between the FCC, other federal agencies, and Tribal, state, and local

governments to promote broadband deployment.[30] Deployment of broadband services in rural Alaska will require the continuation of existing support mechanisms, as well as the creation of new sources of support. Existing broadband deployment support loan/grant programs at RUS and high-cost universal service support and programs such as E-Rate discounts for rural schools and the Rural Health Care programs under the auspices of the USF are critical to GCI's deployment of broadband services. GCI relies on universal service support in its service areas to construct last-mile facilities to provide rural Alaska with voice services via supported wireless last-mile networks that can be upgraded to provide advanced broadband services once the middle mile has sufficient capacity to make the added data speeds available.

The Commission should also add broadband to the list of services that the Lifeline/Link Up program supports; this would be particularly beneficial in tribal lands by providing customer-driven, demand-side assistance that can reduce the price point for broadband, increase broadband adoption rates, and, in turn, allow rural providers to expand build-outs and leverage existing infrastructure to provide advanced services.

For mobile voice services, Lifeline has been of critical importance to enabling the launch of digital wireless services in rural communities that never had such service. The more remote the population, the more critical the provision of broadband and wireless service becomes. More than 50 percent of rural Alaskan subscribers of telecommunication services live below poverty guidelines and therefore qualify for Lifeline services. Wireless service has proven to be popular in rural Alaska and has also

[30] *Tribal Lands Public Notice* at 4.

helped save lives, as it gives people the ability to call for help in remote areas where communication in an emergency was previously not possible.

Figure 2 depicts GCI's three-year wireless deployment plan, providing the first statewide wireless network that includes most Alaskan communities.

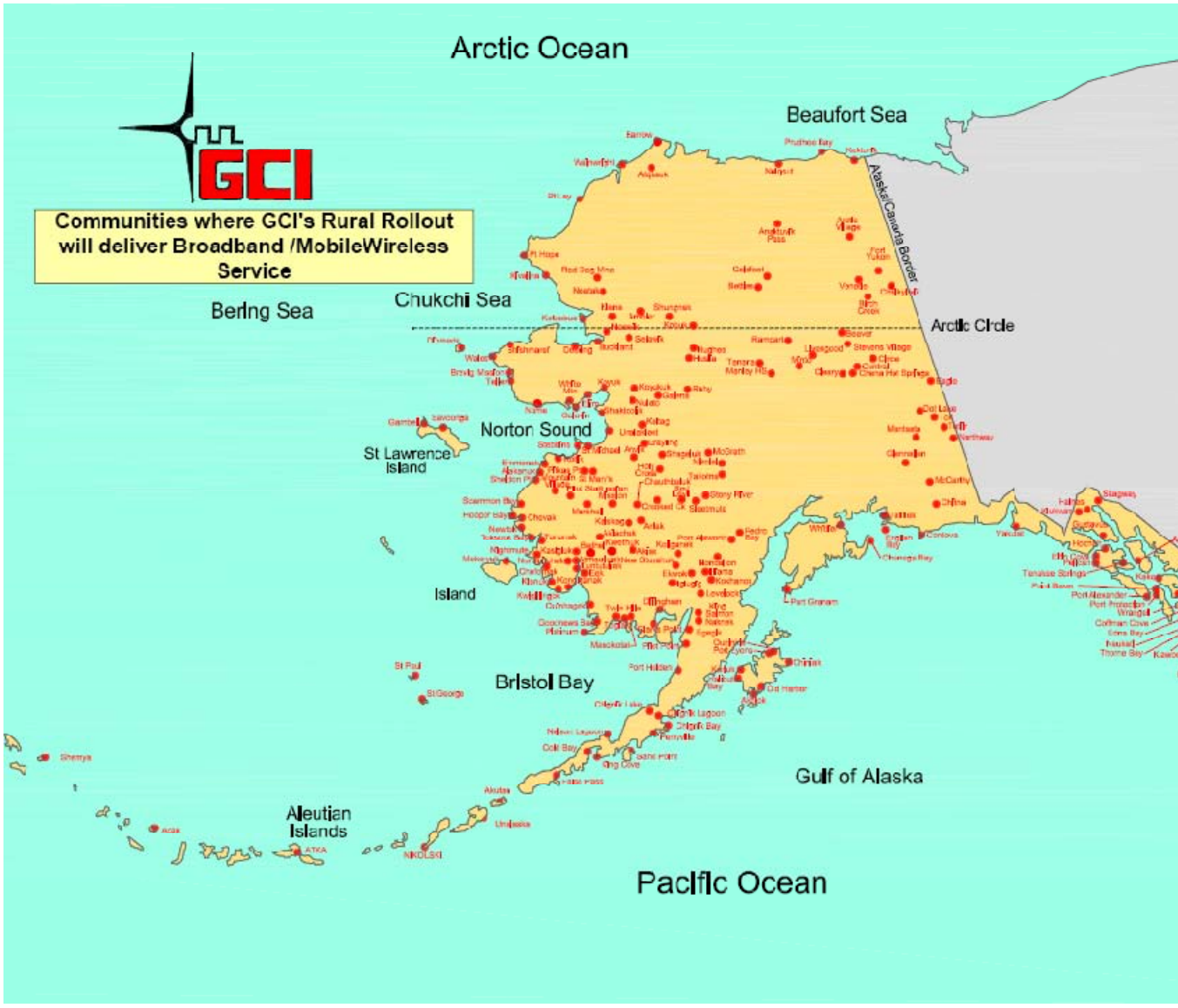

Figure 2[31]

[31] Figure 2 depicts the availability of mobile service following GCI's rollout of its new rural wireless network – assuming that deployment proceeds and is not interrupted by

Grants or loans to anchor tenants for equipment to support advanced telecommunications services, such as distance education and telemedicine, can also stimulate demand for bandwidth, which can help justify deploying the basic infrastructure that can then support the mass market. As discussed further below, the availability of such end-user funding has been a significant factor with respect to the success of DeltaNet. Moreover, the ability to extend infrastructure critical to the delivery of robust mass market broadband services will further depend on advancements in cost-effective technology solutions, availability of additional revenue streams, and/or partnerships among providers to share the risk of building a network sufficiently robust to attract the anchor tenants necessary.

However funded, GCI foresees a five to ten-year timeframe for construction of a TERRA-style middle-mile network to serve these remote Alaska regions. Given Alaska's unique challenges in terms of terrain, weather, permitting, and environmental considerations, and the extremely short construction season in most of Alaska, unrealistic timetables will not speed deployment and should not be encouraged. It will never be reasonable to expect Alaska to deploy a network on a Sunbelt construction schedule, but the Commission can play a role in coordinating a smoother and more streamlined permitting process, which can be especially complex for tribal and/or federal lands.

II. ADOPTION AND DIGITAL LITERACY/EDUCATION

The Commission correctly concludes that "[d]igital literacy and education are key components of broadband adoption," and requests comment on specific tools that the

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changes in the universal service regime for high-cost areas. This network is a ready platform for broadband service, once middle mile and second middle mile solutions re deployed.

Commission and tribes can utilize to promote digital literacy and education on tribal lands.[32] Most of what the Commission stated in 2000 with regard to voice communications when it enhanced Lifeline Tier 4 for the benefit of Native and tribal populations not only remains true, but is also applicable to broadband service. At that time, the Commission noted:

> [B]asic telecommunications services are a fundamental necessity in modern society. As our society increasingly relies on telecommunications technology for employment and access to public services, such telecommunications services have become a practical necessity. The absence of telecommunications services within a home places its occupants at a disadvantage when seeking to contact, or be contacted by employers and potential employers. . . . In geographically remote areas, access to telecommunications services can minimize health and safety risks associated with geographic isolation by providing people access to critical information and services they may need.[33]

The fact that many of Alaskan villages are so isolated, coupled with the increasing reliance on broadband for every aspect of daily life, heightens the need not only to deploy broadband to these remote villages, but also to provide the necessary tools and training that help residents understand, access, and effectively engage the benefits that broadband can provide. Whereas the market, appropriately supported by the government, is better equipped to deploy infrastructure, the government is better equipped to promote digital literacy and education on tribal lands.

Through the E-Rate and rural health care programs, rural Alaska has already seen how advanced broadband communications can provide many invaluable health and

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[32] *Tribal Lands Public Notice* at 5.

[33] Twelfth Report and Order, 15 FCC Rcd at 12212 ¶ 3. The Commission also pointed out that the lack of basic phone service, and thus the "[t]he inability to contact police, fire departments, and medical service providers in an emergency situation may have, and in some areas routinely does have, life-threatening consequences." *Id*. This illustrates just one reason that the Commission must not abandon Lifeline support for voice services, which remain essential to daily life.

education services which otherwise would be unavailable to many Alaska Natives. For example, the Yukon-Kuskokwim Health Corporation ("YKHC") manages a comprehensive health care system on behalf of 58 federally recognized tribes for 50 rural communities in southwest Alaska. The system includes community clinics, subregional clinics, a regional hospital, dental, optical, mental health, and environmental health services, substance abuse counseling and treatment, and health promotion and disease prevention programs.[34] YKHC contracted with GCI for high-capacity broadband services to provide a broad range of health services to largely Native communities in the Bethel region, including advanced high-definition video services for telepsychiatry and ophthalmology, treatments that benefit significantly from low-latency, symmetrical, highly scalable intra-regional bandwidth. Additionally, the ability to use this broadband video teleconferencing network for other medical encounters, family "visits" from the village to in-patients, and professional development for staff has dramatically reduced travel costs for YKHC, and freed scarce budget dollars for other uses.

Similarly, in education, broadband and video teleconferencing can deliver better content and substantially reduce costs. Rural areas in Alaska are high poverty (90 percent of students are eligible for free and reduced lunch), and the costs of delivering all elements of educational services are unimaginably high. The only way these students can receive an adequate and equitable education that meets the standards of "No Child Left Behind" is through broadband services. The availability and continued federal financial support of broadband is absolutely necessary to provide an adequate education.

[34] Yukon-Kuskokwim Health Corporation Home Page, http://www.ykhc.org.

E-Rate digital literacy grant programs and education are perfect examples of how government can provide additional, effective assistance. The Northwest Arctic Borough School District headquartered in Kotzebue, Alaska, for example, serves approximately 37,000 square miles of territory where the villages are accessible only by small aircraft or boat. E-Rate support has enabled the school district to provide high-speed Internet access and distance-learning capabilities to all schools in the district. Many of the district's schools are in small villages in extremely remote locations where it is infeasible for each community to maintain even a small library with current publications and up-to-date research materials. The same is true in the Lower Kuskokwim and Yukon Koyukuk school districts in Alaska, as well as in many other regions.[35] As Dr. Phil Knight, superintendent of Aleutians East Borough School District described, "We are getting away from the traditional four walls of the school. We can think about different ways to offer courses. How we can tie in programs to across the world and get them real time. There's no reason a student can't take a course, practically in any subject, no matter where they live." Most of the rural schools in Alaska participate in the Alaska Association of School Boards Consortium for Digital Learning ("CDL"). This program, partially funded by the Alaska Legislature, puts a laptop computer in the hands of each student, but their utility is directly tied to the available of subsidized broadband in schools. The CDL program would have even greater impact on the students' lives if broadband were available at home – where there is pent-up demand for services available at school. Distance learning technology also permits cost-effective professional training

[35] The Lower Kuskokwim District in Bethel, Alaska, is one of the largest in Alaska, covering 44,000 square miles and serving over 3,700 students, most of which are of Yup'ik Eskimo heritage.

and teacher education to district staff, again using USF-supported distance-learning conferencing services.[36]

Notably, the success of the E-Rate program is not specific to rural Alaska. The Anchorage School District has seen a dramatic turnaround in quality of education since the inception of the E-Rate program. With vastly improved Internet connectivity, programs yielding measureable improvements are possible. One online program has increased reading aptitude by providing students with stimulating current events articles tailored to specific reading levels and slowly providing more difficult literature as the student progresses.[37] Graduation rates and student test scores have increased due in part to the increased access to educational tools provided by the Internet and specifically, the E-Rate program. As Dr. Darla Jones, Anchorage's Secondary Education Technology Coordinator, states: "If the Internet were taken away, we would be lost."[38]

Existing programs, like the E-Rate and the Rural Health Care programs, are critical to continued broadband access by anchor institutions. Community access, in turn, drives demand for mass market access; these USF programs have built an expectation in Alaska for adoption and digital literacy at home. The primary impediment that remains is an economically and technologically sustainable middle-mile solution.

III. ADOPTION AND AFFORDABILITY

The Commission also asks whether "programs such as Lifeline/Link Up be made available to assist in reducing the cost of broadband connectivity and service to homes in

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[36] Universal Service Administration Company, Schools and Libraries Success Story, http://www.usac.org/about/success-stories/schools-libraries.aspx.

[37] EdLiNC and NCTET, *E-Rate: 10 Years of Connecting Kids and Community* 6 (2007), http://www.kempstergroup.com/rf_pdf/NCTETReportE-Rate.pdf.

[38] *Id*.

[tribal lands]."[39] Even if every Alaska resident had the knowledge and tools to extract the great potential of broadband service, it is still more difficult for Alaska Natives to afford broadband service, even in Alaska's cities. For low-income consumers, broadband should not displace support for voice services. Specifically, the Commission should maintain Lifeline Tier 4 and include broadband service as a supported service, especially under the Lifeline Tier 4 program. Customer-driven, demand-side support will help to lower the price point for rural broadband adoption.

IV. THE ROLE OF BROADBAND SERVICE PROVIDERS

The Commission asks about "[t]he practical utility of establishing and promoting pilot programs to support broadband services."[40] The Commission should be wary of launching pilot and/or one-off subsidy programs that may create unsustainable "white elephants" or interfere with the operation of the market in a way that erodes the ability of GCI and other providers to maintain and enhance existing rural service offerings. Such programs not only run the risk of funding unsustainable projects, but could also waste scarce federal dollars when market solutions are identifiable and undermine existing private capital investment in network infrastructure – all to the detriment of tribal land residents. In contrast, access to government-backed loans and demand-side support can greatly enhance the ability of providers in the marketplace to bridge the broadband gap.

GCI has invested hundreds of millions of dollars over the past several years to bring telecommunications service to its customers, not only in Alaska's cities and towns but also in its most remote villages. As a public company with responsibilities to its shareholders and creditors as well as to its customers, GCI has an obligation to develop

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[39] *Tribal Lands Public Notice* at 6.

[40] *Id*.

feasible and sustainable business plans with an appropriate return on invested capital to justify all of its investments. Otherwise, GCI will be unable to raise the required capital in the debt and equity markets.

GCI believes that it can develop feasible and sustainable business plans in the current funding environment (including existing RUS and USF programs) for in-region networks for some, but not necessarily all, of the four additional regions targeted by TERRA. As noted above, however, developing a feasible and sustainable business plan for terrestrial middle-mile facilities to link regional networks to one another and back to Anchorage is far more difficult.

Ultimately, GCI estimates that bringing terrestrial-based broadband service to even 50 of the rural and remote Alaska communities will require approximately $300 million in capital investment over the next five to ten years.[41] GCI is looking at every opportunity (including new technology, new revenue sources, and partnering) to enable such deployment. At the end of the day, deployment may depend on augmenting existing available support mechanisms. But that money should not come from ad hoc pilot programs without a plan for sustainability and leveraged expansion of those projects.

CONCLUSION

The Commission has already taken special care to ensure that the financial resources are available to foster continued network deployment and modern services on tribal lands through its Lifeline/Linkup programs and with respect to high-cost universal service support. This support funds common network investment that will also help to deploy broadband services. GCI is dedicated to furthering the Commission's goal of

[41] That assumes, however, that some parts of interior Alaska will likely remain satellite-served for the foreseeable future.

delivering the best broadband services throughout Alaska as quickly as possible, even in the most remote villages. Informed by experience serving the entirety of Alaska, GCI believes that deployment of terrestrial middle-mile facilities over a ten-year time horizon will provide the necessary links through Alaska with continued access to government-backed capital, sustained support programs to anchor tenants, and the addition of broadband to Lifeline-supported services and bolstered by the development of (i) lower-cost technical solutions, (ii) new middle-mile revenue streams, and/or (iii) partnerships among providers to share the deployment burden. Supported by these measures, the marketplace can ensure that the broadest possible tribal lands subscriber base, including Alaska, has affordable access to residential broadband services.

Respectfully submitted,

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