2017

Legislative Report: Alaska's Current and Future Broadband Coverage

BY: REGULATORY COMMISSION OF ALASKA

TABLE OF CONTENTS

INDEX

Introduction

The 30th Alaska Legislature's budget approval for the Regulatory Commission of Alaska (RCA) required an assessment of current broadband coverage/planned expansions and gaps in broadband infrastructure/financing.[1] The legislative directive comes as the RCA responds to a shift in federal policies from ensuring universal voice service to promoting ubiquitous broadband, with federal funding priorities focused on broadband deployment. The RCA is also considering funding policies for state end-user assessments totaling over $35 million annually, conducting its first significant review of state universal service funding since the federal priority shift from voice networks capable of advanced service to broadband networks capable of voice service.

RCA enabling statutes were adopted in 1990 to facilitate competitive long distance, focused on ensuring voice service rather than promoting broadband. RCA regulatory authority over *networks* is complicated by the fact that mixed-use facilities are used to provide multiple services. While the RCA has specifically asserted jurisdiction over mixed-use facilities that carry intrastate telecommunications services over the network, some *services* such as Internet service currently fall outside RCA regulatory authority due to federal preemption. Different technology platforms are used to provide these services, including wireline, wireless, satellite, and IP-enabled applications. Only one technology (wireline) is currently subject to RCA oversight and funding other than state Lifeline support to wireless subscribers. The RCA is one of a few states that has not reviewed regulatory policies after the federal shift to broadband, with other states enacting various measures in response to intermodal[2] competition focused on broadband. State reforms include direct funding initiatives, refocused state universal service funding, technology-neutral approaches to service deployment/funding, and/or altered approaches to regulating markets.

Included in this report are various mapping resources either developed by RCA staff using various publically available data, or provided by Internet providers or telecommunications carriers in response to inquiries made by the RCA in Docket I-17-004. Accompanying the mapping resources are various exhibits that provide useful data listing communities in Alaska with purported access to broadband Internet service by identified provider, and other exhibits that provide pricing information for Internet service by provider. The report supplies schedules of both federal and state support supplied to carriers under the direct jurisdiction of the Commission, many of whom have wireless and Internet Service Provider affiliates that either receive direct federal support or whose services are thought to receive ancillary benefit from state and federal support. Relatedly, several exhibits provided by carriers make an effort to demonstrate current and planned broadband capable projects the construction of which relied on federal and state support. The report also attaches several private studies that were conducted recently to assess the estimated cost of providing potential access to broadband Internet service to most if not all parts of Alaska using a variety of technologies. Important caveats and clarifications to these appendices and exhibits are noted in the report where appropriate. The report concludes with several key takeaways

[1]The appropriations language specifically provides:

> It is the intent of the legislature that the Regulatory Commission of Alaska provide to the House Finance Committee, the Senate Finance Committee and the Legislative Finance Division, by December 1, 2017, an analysis of Alaska's current broadband coverage and providers' planned coverage expansions, and a description of the remaining gaps in statewide infrastructure and financing.

CCS HB 57, Section 1 (Chapter 1 SSSLA 17).

[2]Intermodal competition refers to the provision of the same service by different technologies, such as when a cable company and local exchange company compete to provide video services to the end user.

the RCA hopes the Legislature will keep in mind when approaching the very complicated issue of spurring broadband Internet deployment.

Definitions

Broadband: The FCC defines broadband as "high speed Internet access that is always on and faster than traditional dial-up access." Broadband speed requirements imposed by the FCC change as technology improves and faster access methods become available. The 2016 FCC Broadband Progress Report sets a minimum benchmark speed for broadband at 25 Mbps download/3 Mbps upload (25Mbps/3Mbps) for fixed services, up from 10Mbps/1Mbps in 2015.

Last Mile: Connection between your home (or wireless device) and your broadband service provider.

Second Mile/Middle Mile: The connections between your broadband service provider and the Internet.

RCA Enabling Statutes

AS 42.05.145(a) provides that "[a] utility that provides local exchange or interexchange telecommunications service in the state affects the public interest. Regulation of these utilities shall, consistent with this chapter, seek to maintain and further the efficiency, availability, and affordability of universal basic telecommunications service."

AS 42.05.990(6)(B) states that "public utility" or "utility" "includes every corporation . . . that owns, operates, manages, or controls any plant, pipeline, or system for . . . furnishing telecommunications to the public for compensation."

AS 42.05.990(13) defines "telecommunications" as "the transmission and reception of messages, impressions, pictures, and signals by means of electricity, electromagnetic waves, and any other kind of energy, force variations, and impulses whether conveyed by cable, wire, radiated through space, or transmitted through other media within a designated area or between designated points."

AS 42.05.830 provides that "[i]n providing for competition under AS 42.05.800 to AS 42.05.890 [*Competitive Intrastate Long Distance Telephone Service*], the [RCA] shall establish a system of access charges to be paid by long distance carriers to compensate local exchange carriers for the costs of originating and terminating long distance services."

AS 42.05.840 provides "[t]he [RCA] may establish a universal service fund or other mechanism to be used to ensure the provision of long distance telephone service at reasonable rates throughout the state and otherwise preserve universal service."

AS 42.05.296(a) provides "[t]he [RCA] shall adopt regulations to require telephone utilities to provide service to deaf, hard of hearing, and speech impaired subscribers that permits the subscriber to communicate by telephone with persons of normal hearing and that makes available reasonable access of all phases of public telephone service to deaf, hard of hearing, and speech impaired telephone subscribers. The regulations must provide for cost recovery through surcharges added to the basic local exchange rate. The [RCA] shall hold hearings to determine the most cost-effective method of providing this service."

Infrastructure Deployment (History)

A. Historical Context

Traditional regulation involved the award of a monopoly franchise and the ability to recover all reasonably incurred costs of providing service plus a reasonable return. Providers committed to certain service requirements, which in telecommunications were essentially to (1) serve all customers within the service territory, extending facilities when necessary, (2) obtain regulatory approval before discontinuing service, (3) charge just and reasonable rates, and (4) exercise adequate care, skill, and honesty when providing service. These obligations form the core of telecommunication carriers' COLR duties,[3] with certain carrier-to-carrier duties added to COLR obligations in the competitive era.

Historically providers operated in a monopoly environment and fell into one of two basic categories - local exchange carriers (LECs, providing local service) and interexchange carriers (IXCs, providing long distance service). Providers were given a reliable revenue stream to recover the costs of providing service, with costs recovered through customer revenues and intercarrier compensation. LECs and IXCs were precluded by federal law from competing against each other in the post-divestiture era.[4] The division of state and federal jurisdiction was clear, with lines of regulatory authority based on the end points of a voice call.[5]

B. Competitive Era

The dynamic changed with the introduction of competition into long distance markets in the 1980s[6] and into local exchange markets in 1996.[7] The 1996 Act particularly changed the dynamic, with carrier-to-carrier duties imposed on incumbent LECs (including an obligation to allow unbundled access the incumbent's network). The Act also allowed LECs – previously precluded by federal rules from providing interexchange service – to compete in the interexchange market.

---

[3]*See Carrier of Last Resort: Anachronism or Necessity*, S. Lichtenberg, National Regulatory Research Institute Report No. 16-06 (July 2016) at 9 (citation omitted). *See also Carriers of Last Resort: Updating a Traditional Doctrine*, P. Bloom and P. Bernt, National Regulatory Research Institute Report No. 09-10 (July 2009) at 4-14 (listing similar COLR duties, with rate obligations including "retail benefits" such as discounted rates for low-income consumers).

[4]Before divestiture AT&T was the sole provider of local and long distance telephone service in most of the United States, with most telephone equipment produced by a subsidiary. AT&T had almost total control over communications technology in the country, leading to an antitrust lawsuit that was settled by an agreement to break up the AT&T organization. AT&T retained control of some holdings (including the equipment and long distance subsidiaries) and gave up ownership of its LECs, which became seven independent regional companies in 1984.

[5]Voice traffic within a community (local exchange service) and between communities in the same state (intrastate interexchange service) fell within the state's regulatory purview, while voice traffic between the states (interstate interexchange service) fell under federal jurisdictional authority.

[6]The FCC forced AT&T to allow MCI to connect its long distance lines into the Bell system in 1968, commencing long distance competition at the federal level. GCI commenced interstate long distance service by competing with AT&T in 1982, but policies of RCA's predecessor agency (APUC) precluded intrastate long distance competition until the Alaska legislature found in 1990 that intrastate long distance competition was in the public interest, ordering the RCA to adopt regulations governing competitive intrastate long distance service.

[7]The Telecommunications Act of 1996, 47 USC §§ 151 *et seq*. ("the Act").

The Act also introduced a third revenue stream to help providers defray the cost of service – a universal service fund (USF) component.[8] Many states (including Alaska) followed suit to augment federal USF support with state funding, with the Alaska Universal Service Fund (AUSF) established in 1999. State and federal universal service funding helped carriers build more robust networks capable of providing access to advanced services, allowing carriers to expand into other service offerings (including broadband Internet). The federal policy of providing duplicate USF support to competitive entrants spurred wireless expansion,[9] and many Alaskan carriers entered or expanded their presence in the wireless market. Technology evolved to allow the delivery of advanced services through various technologies,[10] with multiple technology platforms capable of carrying advanced information services at varying performance levels. Modern communications now involves intermodal competition with multiple providers and platforms able to carry multiple services (e.g., voice, data, video programming).

It should be noted, however, that despite the use of federal and state universal service funds to deploy networks capable of providing advanced services such as broadband Internet, state and federal universal service funds are not generated from Internet services because the associated surcharges are not assessed against Internet services.[11]

C. Universal Service Focus Shifts from Voice to Broadband

The increased capabilities of modern networks led to a change of the overarching universal service policy objective in 2009, when the Federal Communications Commission (FCC) issued the *National Broadband Plan* proposing to shift the focus of federal universal service funding from ensuring universal voice service to promoting ubiquitous next-generation broadband capability.[12] The FCC formalized federal broadband initiatives by release of the *Transformation Order* in 2011,[13] converting high cost USF support from a system designed to support voice networks capable of advanced services to a system designed to support broadband networks capable of providing voice service.

The high cost USF fund was transformed into three new funds – the Connect America Fund (CAF), the Mobility Fund, and the Remote Areas Fund (RAF). Conversion of the high cost federal USF fund generated extensive advocacy regarding appropriate distribution levels from the fund. Alaskan carriers were united in their requests to relax broadband performance obligations and maximize federal USF funding for Alaska, urging federal officials to recognize Alaska's relative paucity of middle mile transport capability and considerably higher cost of facilities deployment driven by topography (with vast expanses separating rural communities) and demographics (with dispersed population bases). As

[8]Federal USF was created in response to the Act, requiring all providers of telecommunications services to contribute to federal and state universal service. Four federal USF programs were created – high cost, low income (lifeline/linkup), rural health care, and schools and libraries (e-rate).

[9]Federal USF was awarded to competitive entrants (including wireless providers) under an identical compensation rule, with competitors receiving per-line subsidies based on incumbent LEC costs.

[10]Traditional wireline telephone service was increasingly complemented by microwave and satellite long haul transmission systems, wireless service, and fiber optic transmission. Some wireline cable systems were re-engineered to provide voice and high capacity Internet service, and some wireline telephone systems were re-engineered to provide cable and high capacity Internet service.

[11]*See generally* Internet Tax Freedom Act of 1998 (P.L. 105-277); made permanent in 2016 with the passage of the Trade Facilitation and Trade Enforcement Act of 2015 (P.L. 114-125).

[12]*Connecting America: the National Broadband Plan*, Federal Communications Commission (delivered to Congress March 16, 2010).

[13]*See Connect America Fund*, WC Docket No. 10-90 *et al.*, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663 (2011) ("*Transformation Order*").

discussed in detail under *Infrastructure Funding*, Alaskan carriers achieved significant success in this area, obtaining considerable federal USF revenue streams to increase broadband capabilities.

D. RCA Response to Federal Broadband Policy Shift

The RCA continues to operate under the guidance of enabling statutes enacted in 1990 to spur competitive long distance voice service, and has not reviewed overarching regulatory policies since the federal shift to a broadband priority. RCA regulations have not been modified to clarify jurisdictional divisions, network definitions, or state regulatory oversight responsibilities in the broadband era. The only real market shift has been at the carrier level, with additional cooperative carriers obtaining exemption from RCA rate/service quality oversight by vote of cooperative members.[14]

Infrastructure Deployment (Regulatory Issues)

A. Modern Network Characteristics

The transmission of voice and data service involves two main components (local distribution or last mile, and long-haul transport or middle mile).[15] Transmission is typically provided over a combination of technologies, with the type of voice and data access in Alaska - and the technology used to provide such access - varying significantly by region.[16] Many Alaskan providers are affiliated with the regional LEC and/or IXC, while other providers may limit offerings to broadband and/or wireless service. Local distribution facilities within communities (last mile) vary by provider. LEC affiliates often provide broadband by digital subscriber line (DSL) service over existing wireline (copper and fiber) facilities, while cable affiliates may use the local cable platform to deliver service to the home. Providers without a local wireline distribution network are likely to construct a less capital-intensive wireless network. Integrated providers may use or lease a combination of the wireline, cable, and wireless facilities. Long-haul transport (middle mile) is accomplished through a combination of wireline, microwave, and satellite facilities. Transport between Alaska communities is accomplished through wireline (copper and fiber), wireless (microwave systems), and satellite, while connections between Alaska and the continental United States are through fiber and satellite. Maps showing the RCA's knowledge of current and planned middle mile infrastructure are attached as Appendix A.

[14]RCA enabling statutes allow cooperative utilities to elect to be exempt by majority vote (provided 15 percent of its members vote). Those carriers are exempt from statutes other than those pertaining to certification, and are not subject to RCA rate or service quality oversight. *See* AS 42.05.711(h), AS 42.05.712. Privately owned telecommunications companies are not eligible to seek exemption from RCA rate/service quality regulation. *See generally* AS 42.05.711.

[15]When speaking of voice traffic, facilities are depicted as either local exchange (carrying voice traffic within a community) or interexchange (carrying voice traffic between communities). When discussing data (Internet) traffic, the terminology used is last mile (carrying data from the local provider to the end user) or second mile/middle mile (carrying traffic from the local provider to the Internet point-of-presence).

[16]Middle mile for Internet broadband and communications services are provided through direct satellite connectivity in many (particularly remote) Alaska communities. Alaska's larger communities are typically connected through various technologies, with fiber deployed where economically feasible as it provides the most capacity for advance services such as broadband. In some instances satellite transport and/or fiber are combined with microwave facilities, as is the case in areas of Southeast Alaska and Southwest Alaska. The most comprehensive middle mile network in rural Alaska is TERRA SouthWest (TERRA SW, GCI's terrestrial fiber/microwave network connecting western Alaskan communities to a fiber connection to traversing through Kodiak, Anchorage, and the Kenai Peninsula before connecting to the continental United States through undersea fiber).

B. Network Reporting Obligations

Alaskan providers use their networks to provide a package of services that likely include local/long distance voice, Internet (broadband), cable, and/or wireless, with service provided to end users through affiliated companies. The broadband mapping aspect of the legislative directive is complicated by the view of some providers (including regulated telecommunications companies) that the RCA lacks regulatory authority to require the filing of network information. While RCA regulations require facilities-based IXCs to file maps that would encompass middle-mile facilities within Alaska,[17] voice providers owning long-haul transport capability often render this requirement inapplicable by classifying facilities as local exchange facilities[18] or by arguing facilities are interstate in nature based on the fact the network carries a certain percentage of interstate traffic.[19] Providers use affiliate relationships to evade regulatory reporting requirements imposed on facilities-based IXCs, with networks transporting voice and data traffic between Alaskan communities ostensibly deemed LEC facilities leased to the IXC or ISP affiliate to provide end-user service.[20] RCA network oversight is further marginalized as Alaskan carriers transfer Alaskan networks carrying voice traffic without notice to or approval by the agency.[21]

C. Jurisdictional Debate

Several regulated telecommunications companies with ISP affiliates argue RCA regulatory authority does not allow any level of broadband service or network oversight, disputing RCA ability to compel the filing of network information related to broadband service. The carrier position against state oversight focuses on the service provided, arguing federal precedent precludes state regulatory oversight of Internet (broadband) service.[22] This view is supported by relatively clear regulatory distinctions regarding service offerings. Traditional wireline service is jurisdictionally divided, with state commissions regulating local and intrastate long distance wireline telephone (and in some instances

[17] *See* 3 AAC 52.390(o), requiring the annual filing of facilities maps by facilities-based IXCs. Only AT&T Alaska and GCI submit the middle-mile maps required of facilities-based IXCs.

[18] These issues were highlighted in a proceeding where AT&T petitioned to transfer IXC COLR duties to GCI in TERRA-SW locations, with GCI arguing against consideration as a replacement IXC COLR (Docket U-12-127). GCI argued its LEC affiliate (UUI) owned TERRA-SW and sold network capacity to GCI and other carriers to provide end-user service, and could not be deemed a facilities–based IXC as it did not provide end-user service. GCI also argued UUI was not "willing" to be an IXC and thus could not be required to obtain a certificate as a facilities-based IXC.

This type of affiliate relationship is common in Alaska, with several LECs characterizing facilities used to transport voice and data traffic between communities as local exchange/last mile facilities rather than long distance/middle mile facilities. These LECs classify their IXC affiliates as resellers of IXC service not subject to reporting requirements imposed on facilities-based IXCs.

[19] GCI's Docket U-12-127 arguments included a contention that UUI sells exclusively interstate private line service, and any private line carrying 10% or more interstate traffic is an intrastate private line service that cannot be regulated by state commissions such as the RCA.

[20] Existing subsidy streams provide a financial incentive to classify network facilities as LEC facilities, with federal and state USF offsetting LEC costs (IXCs receive no similar network support in Alaska).

[21] For example, GCI acquired the fiber link connecting the TERRA-SW network to Kodiak, Anchorage, and the Kenai Peninsula from Kodiak Kenai Cable Company in July 2016. This transaction, involving a network carrying intrastate voice traffic between Alaskan communities, was consummated without written notice to (or the approval by) the RCA.

[22] Two entities currently disputing RCA authority to require broadband information argued for RCA broadband rate oversight authority in the IXC COLR transfer proceeding (Docket U-12-127). ACS and the Rural Coalition requested a greater level of state commission regulation of access and pricing for GCI's TERRA-SW network, with the Rural Coalition arguing RCA had authority to establish rates for broadband service under the *Transformation Order*.

cable service),[23] while the FCC regulates interstate long distance wireline phone service. For wireless service, state commissions may impose service conditions as part of the ETC designation process[24] but the FCC has preempted states from inhibiting market entry/exit or providing rate oversight. Internet (broadband) service is also not subject to state regulation and enjoys minimal federal oversight (including freedom from rate oversight or intercarrier compensation obligations). And as noted above, Congress has effectively precluded the RCA from assessing its AUSF surcharge against Internet services despite the fact Internet providers and subscribers benefit from the network enhancements made possible in small part by AUSF support.

The RCA position focuses on the underlying network, contending that any network carrying intrastate traffic implicates the RCA's statutorily-imposed network oversight responsibilities (including the responsibility of ensuring network reliability and nondiscriminatory access). This responsibility necessarily entails the ability to require network information. As virtually all telecommunications facilities are mixed-use facilities carrying both jurisdictionally interstate and intrastate traffic (local and long distance voice, video, and data communications), jurisdiction over mixed-use network is shared by federal and state regulatory bodies. Under this view, the state maintains limited jurisdictional authority over any mixed-use facility that carries intrastate voice traffic.[25]

Infrastructure Funding (Current Revenue Streams)

Income sources for Alaskan providers consist of customer revenues and intercarrier compensation, with Alaskan wireline LECs and their wireless affiliates also receiving federal and state funding. RCA knowledge of industry revenue streams is discussed below.

A. Customer Revenues

Most providers (including cable, Internet, wireless providers) may increase customer rates without regulatory approval, but rate hikes create a risk of market share loss in competitive markets. The ability of Alaska's IXCs to increase long distance calling rates is constrained due to both RCA policy (mandating parity in intrastate and interstate long distance rates) and competitive pressures (competing with wireless/VoIP providers and consumer migrations to texting applications). Deregulated LECs may revise rates without RCA oversight, while regulated LECs must obtain regulatory approval to revise rates. Practically speaking, the RCA no longer requires rate filings and no Alaska LEC has filed for a rate increase in the last ten years. Further, the RCA has no jurisdictional control over the rates charged for Internet access services and has no current direct knowledge regarding the revenues generated from Internet access services from any provider, including providers directly affiliated with regulated carriers providing voice service in Alaska.

[23] State statute provides that cable service is exempt from RCA rate oversight unless the subscribers successfully petition for economic regulation. AS 42.05.711(k). However, this statutory scheme violate the FCC regulatory scheme precluding state rate regulation of cable systems subject to competition (47 USC § 543(a)(1)), particularly after the FCC's 2015 ruling that created a rebuttable presumption that cable operators are subject to effective competition. *See In the Matter of the Amendment to Commission's Rules Concerning Effective Competition*, 30 FCC Rcd 6574 (2015).

[24] The 1996 Act delegates to state commissions the responsibility of designating carriers as Eligible Telecommunications Carriers (ETCs) eligible for federal USF. See 47 USC 214(e)(2).

[25] The RCA clarified its ability to assert jurisdiction over facilities whose traffic includes voice communications between points in Alaska in Docket U-12-101 (involving a request to discontinue service by the owner of a fiber network within Alaska) and R-13-001 (defining procedures to reassign IXC COLR duties). *See* Orders U-02-101(2)/U-02-102(2) at 6-12; Order R-13-001(3) at 2-6.

B. Intercarrier Compensation

Intercarrier compensation refers to charges one carrier pays to another carrier to originate, transport, and/or terminate telecommunications traffic. The two major forms of intercarrier compensation are access charges and reciprocal compensation. Access charges generally apply to calls that begin and end in different local calling areas,[26] while reciprocal compensation generally applies to calls that begin and end within the same local calling area. At one time intercarrier compensation was a significant portion of LEC revenue streams, with the access charge component resulting in IXCs paying a significant portion of the cost of the local network. However, reform at both the state and federal level substantially reduced the amount of revenue generated by intercarrier compensation.

At the federal level, the FCC comprehensively reformed intercarrier compensation, with a goal of transitioning to a bill-and-keep approach that sets intercarrier compensation at zero and has providers look to their customers and USF mechanisms to recover network costs. At the state level the RCA reformed the intrastate access charge regime in 2012, transitioning access charge payment responsibility from IXCs to end-users in exchange for long distance rate reductions. These reforms indicate LECs will not receive significant amounts of intercarrier compensation to offset network costs in the future, with revenues declining further under a federal bill-and-keep regime.

There is a transitional federal intercarrier compensation support directed to incumbent wireline LECs as part of the federal reforms.[27] The *Transformation Order* required scheduled reductions to ICC charges, and adopted recovery mechanisms to mitigate incumbent LEC ICC revenue reductions. Amounts are first recovered through an Access Recovery Charge (ARC), a monthly end-user surcharge. The ICC support mechanism provides additional federal support to the extent the LEC's eligible recovery amount is not recovered through the ARC.[28] A residential rate ceiling applies, with local rates (including subscriber line charges and other fees) plus the ARC not to exceed $30 per month.[29] Local rates must fall below federal benchmark rates to receive ICC support (ARC assessments apply regardless). ARC surcharges - initially set at 50¢ per line ($1.00 for multi-line business) in 2012 – are subject to an annual increase limit of up to 50¢ per year ($1.00 for multi-line business) until reaching an established cap of $3.00 in 2017 ($6.00 for multi-line business). As shown on Appendix B, in 2016 Alaska wireline incumbent LECs recovered monthly ARC surcharges of up to $2.50 per line ($5.00 for multi-line business) as well as $11,821,869 in federal ICC support.[30]

C. Federal Universal Service Fund

Federal USF consists of four main programs – Lifeline, Schools and Libraries (E-rate), Rural Health Care, and High Cost (which has three funds - Connect America Fund (CAF)), Mobility Fund, and Remote Areas Fund (RAF)). As shown on Appendix B, in 2016 Alaskan wireline LECs received $16,473,066 in federal Lifeline support, $73,676,871 in Schools and Libraries support, and $109,814 in Rural Health Care support. The high cost funding process is more convoluted, with CAF funding

[26] Interstate access charges apply to calls that originate and terminate in different states, and intrastate access charges apply to calls that originate and terminate in different local calling areas within the same state. Access charges do not apply to Internet service providers under an exemption for enhanced service providers that use the facilities of local telephone companies.

[27] *Transformation Order* at paragraphs 847-932.

[28] For summary of the ARC and ICC support mechanisms, *see* In the Matter of Access Charge Tariffing Introducing Broadband-Only Loop Service, WC Docket 16-317, *Order on Reconsideration*, DA 16-1258 (rel. November 4, 2016).

[29] Universal Service Administrative Company website, *High Cost/ICC Recovery* (November 12, 2017).

[30] *See* 47 CFR § 51.917(e)(5) (price cap carriers); 47 CFR § 51.917(e)(6) (rate of return carriers).

differing for price cap and rate of return wireline LECs, wireless carriers, and (in some circumstances) satellite providers.[31] Alaska wireline LECs and wireless carriers obtained certain concessions based on the state's broadband deployment challenges, including increased support levels. RCA knowledge of federal USF support flowing to Alaskan providers in recent years are also listed on Appendix B.

ACS (Alaska's only price cap LEC) received two one-time awards of CAF support. First, ACS received $4,358,903 in 2012 to deploy broadband to 5,401 locations[32] and $173,800 in 2013 to deploy broadband to 316 locations.[33] ACS also received annual frozen support of $19,694,208 for a ten-year term commencing in 2016 to deploy broadband to at least 31,571 locations.[34] Alaska's rate-of-return LECs and wireless providers received a total of $22,158,519 in phased-down support annually from 2012 until approval of the Alaska Plan,[35] with Alaskan wireless providers also receiving one-time awards of Mobility Funds ($3,242,067) and Tribal Mobility Funds ($41,566,542).[36] Alaska's LECs and wireless affiliates will receive frozen support annually through 2025 due to approval of the Alaska Plan, with a total of $543,762,240 awarded to wireline LECs and $739,375,080 awarded to their wireless affiliates. As is referenced in Appendix B, federal high cost support for all Alaska carriers through 2025 under the various support mechanisms exceeds $1.6 billion; while historic non-high cost support to Alaska carriers (2012-2016), including Lifeline, E-rate, and Rural Health Care programs exceeded $389 million. Assuming no drastic changes to any of the non-high cost support programs by the FCC, it is reasonable to assume Alaska carriers may receive a combined federal subsidy in excess of $2 billion through 2025 based on historical projections.

To receive federal support, Alaska LECs and wireless affiliates must expand broadband service meeting stated service levels to a specified number of locations (for wireline providers) and to a specified population (for wireless providers). Reduced service standards apply to communities without terrestrial middle mile.[37] AT&T Alaska – the only federally subsidized Alaskan wireless carrier not receiving

[31]The *Transformation Order* provided price cap carriers would receive CAF in phases - initial awards to boost broadband deployment and annual frozen support for a fixed term. Rate of return carriers received phased-down support from legacy USF programs through 2017. Mobility Funds were awarded in phases, with initial amounts to incentivize broadband deployment and annual support to deploy mobile voice and broadband networks to unserved areas. A separate one-time Tribal Mobility Fund Phase I awarded additional funding to Tribal lands through a reverse auction process. The RAF will provide funding to ensure those living in remote areas obtain affordable access to alternative technology platforms such as satellite and unlicensed wireless. The FCC also imposed public service obligations to ensure systems are capable of broadband delivery.

[32] This amount was awarded during CAF Phase I, Round 1. *See* July 24, 2012 letter from A. Gardner (ACS) to M. Dortch (FCC), Acceptance of CAF Phase I support.

It should be noted that "locations" in this context refers to individual residences, businesses or premises; not communities or other locales.

[33] This amount was awarded during CAF Phase I, Round 2. *See* August 20, 2013 letter from R. Willard (ACS) to M. Dortch (FCC), CAF Phase I, Round 2 Election; FCC Public Notice DA13-2103. *Over $32 Million of Connect America Funding Authorized to Connect Unserved Homes and Businesses in Alaska, Hawaii, and Puerto Rico*, WC Docket No. 10-90 (rel. October 31, 2013).

[34] This amount was awarded during CAF Phase II. *See Connect America Fund*, Order, FCC 16-143, WC Docket No. 10-90, (rel. October 31, 2016).

[35] The total amount of Alaska Plan funding reduced after four wireline LEC Alaska participants opted to accept model-based support in lieu of Alaska Plan support.

[36] Mobility Phase I funds were awarded to GCI ($3,242,067), while Tribal Mobility Phase I funds were awarded to GCI ($41,414,142) and Copper Valley Wireless ($152,400).

[37] Broadband performance levels under the Alaska Plan and the ACS CAF awards are lower, with performance goals of 10/1 Mbps and 25/3Mbps for a specified number of locations (service below that level may be approved, with reduced service levels of 1 Mbps/256kbps apply where terrestrial backhaul facilities are unavailable). Wireless performance expectations are

Alaska Plan funding – also received concessions under the Alaska Plan, obtaining a three-year phase down of support with an additional one-year implementation delay, resulting in $15.8 million in federal CAF high cost support flowing to AT&T through 2020.

Alaska Plan support may be expended on middle-mile deployment, but there is no obligation that Alaskan Plan USF recipients use funding to build middle-mile facilities. This lack of prioritization of middle-mile funding created dissension at the federal level, with FCC Commissioners Ajit Pai and Mignon Clyburn dissenting to the Alaska Plan awards due to the existence of duplicate funding and the lack of focus on middle mile funding.[38]

Aside from some future allocations of RAF monies,[39] Alaska is not likely to receive significant additional amounts of federal USF to deploy middle-mile facilities. While the FCC left open the possibility of redirecting a portion of federal USF allocated for wireless service expansion from areas with multiple providers to unserved areas at the Alaska Plan's midway point,[40] federal funding beyond that already allocated to carriers serving Alaska appears unlikely. While additional federal programs provide grant or loan support to deploy broadband facilities,[41] these programs focus on singular projects and do not provide funding of the magnitude awarded under FCC CAF and Mobility fund awards.

D. State Funding

In response to questions issued by the RCA, several industry members suggest any funding for broadband deployment come from the general fund. While general fund appropriations to support broadband deployment and adoption measures may be the optimal solution, such appropriations appear unlikely in the near future given the State of Alaska's current economic climate. The following discussion focuses on RCA-controlled funds recovered through line-item assessments on end-users.

measured by technology, with an expectation that 4G LTE service be extended where feasible (funding is also provided to maintain 2G or 3G service or upgrade service from 2G to 3G).

[38] See *Alaska Plan, Dissenting Statements of Commissioners Ajit Pai and Mignon Clyburn*. Chairman Pai argued the Alaska Plan violated three basic universal service reform tenets – providing $60 to $120 million for duplicate build out, awarding $230 million to wireless carriers to serve remote areas already served by qualified competitors, and carving out a $15.8 million funding stream for the only non-Alaska Plan subsidized wireless company (AT&T Alaska). Commissioner Clyburn also questioned the Alaska Plan's approach of funding multiple overlapping wireless providers, an approach that violated key USF reform principles of not providing duplicate support in the same area and not subsidizing carriers where unsubsidized carriers provide service. Commissioner Clyburn also questioned the funding focus on last-mile facilities and felt the Alaska Plan did little to address Alaska's middle mile problem, noting that she and Commissioner Pai supported diverting the $35 million in duplicate federal funding under the Alaska Plan to instead support broadband middle mile deployment measures.

[39] The RAF will provide at least $100 million per year nationwide for broadband deployment in remote areas where the cost of deploying traditional terrestrial broadband networks is exorbitant. RAF is directed at ensuring residents in the most remote high-cost areas obtain affordable access through alternative technology platforms, including satellite and unlicensed wireless services.

[40]The Alaska Plan provides for a possible a reverse auction at the five-year point of the ten-year plan to redirect wireless support from areas with multiple carriers to unserved areas. *Alaska Plan* ¶¶ 92-95.

[41] Other federal broadband deployment programs are explained in Appendix C – Description of Federal Broadband Deployment Programs.

1. *Alaska Universal Service Fund*

The AUSF (established in 1999) initially provided support for Lifeline[42] and DEM,[43] with PIPT support[44] added in 2002. AUSF was augmented by a Network Access Fee (NAF) assessment in 2005, a line-item charge imposed on wireline LEC customers to reduce access charge payment requirements for IXCs.[45] The NAF - initially $1.50 per line/month - increased to $3.00 per line/month in 2007. In 2011 the RCA further expanded the AUSF to transition intrastate access charge payments from usage-sensitive per minute assessments on long distance calls to monthly assessments on end users, adding two high cost assessments (CCL and COLR)[46] and phasing in a NAF increase to $5.75 per line.[47]

The CCL, NAF and COLR financially insulate wireline incumbent LECs from revenue loss in competitive markets, with incumbent wireline LECs receiving their last RCA-approved access revenue requirement (determined at the time of competitive entry).[48] To accomplish this, COLR increases when NAF and CCL revenues (both of which are capped) are insufficient to satisfy the LEC access revenue requirement, with COLR support making up the difference between combined annual NAF and CCL support and the last RCA-approved access revenue requirement.[49]

AUSF is recovered through an end-user assessment on specified communications services with assessments on services that include local and long distance wireline, wireless, and interconnected VoIP.[50] As noted above, the AUSF surcharge is not assessed against Internet access services. The NAF, a per-line state assessment on wireline LEC customers, is not part of the AUSF and is itself subject to the AUSF assessment. Carriers subject to the AUSF surcharge allocate customer revenue among the

[42] State AUSF augments a federal Lifeline program designed to ensure low-income consumers can obtain phone service.

[43] Dial Equipment Minute (DEM) is a measure of switch usage, with DEM weighting support provided to smaller carriers to increase their recovery of switching costs. DEM support is provided to three incumbent wireline LECs serving high cost markets. While DEM support was originally geared for smaller carriers (measured by access lines), two of the three recipients of DEM support (UUI and United-KUC) are affiliates of Alaska's largest carrier (GCI).

[44] The public interest pay telephone (PIPT) program is designed to guarantee access to pay telephone service in Alaska communities, with support ensuring LECs do not operate PIPTs at a loss.

[45] Order R-01-001(13), *Order Adopting Regulations*, dated September 28, 2004, at 8-9 (adopting AAICM Section 109 to implement the NAF).

[46] Carrier Common Line (CCL) support allows wireline LECs in competitive markets to receive monthly CCL amounts to offset access charge revenue losses, while COLR support compensates the incumbent wireline LEC for performing COLR duties. As part of this reform, IXCs were required to reduce access charges to levels on par with interstate access charges by the end of a five-year period. Order R-08-003(8)/R-09-003(4), *Order Adopting Regulations and Requiring Reporting*, dated August 18, 2010 , at 13-21; *see also* 3 AAC 52.372.

[47]NAF, set at $3.00 per month at the time R-08-003 reforms were adopted, was subject to a phased-in increase until it reached the current (capped) level of $5.75 per month. AIIACM Section 109.

[48]An incumbent LEC must leave the AECA access charge pool and charge company-specific rates upon the commencement of competition in its area, with the timing of pool exit is coordinated with approval of the exiting LEC's access tariff. AIIACM Section 001(d).

[49]*See* 3 AAC 52.345(e)-(g). Combined NAF/CCL revenue is calculated by multiplying the revenue generated by the most recent three-month period by four. 3 AAC 52.345(e).

[50] 3 AAC 53.340(a) lists intrastate revenues subject to the AUSF assessments: (1) cellular telephone/ paging service, (2) mobile radio service, (3) operator service, (4) personal communication service, (5) special access service, (6) wide area telecommunications service, (7) toll-free service, (8) 900 service, (9) message telephone service, (10) private line service, (11) telex, (12) telegraph (13) video service, (14) satellite service, (15) resale of intrastate services, (16) pay phone service, (17) local exchange service, (18) the local NAF, and (19) Voice over Internet Protocol (VoIP).

interstate and intrastate jurisdictions, with the AUSF surcharge factor applied to intrastate gross revenues.

State Lifeline disbursements are provided to wireless and wireline carriers providing discounted local calling service. Remaining AUSF disbursements are limited to wireline LECs. COLR is distributed to incumbent wireline LECs in competitive markets, while and CCL support is provided to all wireline (competitive and incumbent) wireline LECs.[51] Until recently, Anchorage – the state's largest market – was the only competitive market deemed ineligible for COLR support. With regard to 2016 support amounts, the AUSF distributed $1,459,829 in state Lifeline support, $99,221 in PIPT support, $1,236,687 in DEM support, $9,337,617 in COLR support, and $15,234,699 in CCL support. While RCA records regarding statewide NAF collections are incomplete, incumbent wireline LECs in competitive markets other than Anchorage reported $11,081,561 in NAF collections in 2016.[52]

For historical perspective, the AUSF grew from $3.5 million in 1999 (with a 1.8% surcharge factor) to $27.5 million in 2016 (with a 14.2% surcharge factor at year-end). The 2018 AUSF surcharge increased further to 15.8%.[53] The NAF, which did not exist in 1999, is now at $5.75 per line per month. AUSF distributions and collections are listed on tables shown on Appendix D, along with annual surcharge and NAF amounts. These tables show a trend of declining intrastate revenues, currently estimated by AUSAC at an annual declination rate of 14%,[54] even as AUSF distributions remain relatively stable, resulting in an escalating AUSF surcharge factor as the responsibility to cover those distributions is spread over an ever-declining subscriber base.

For most aspects of AUSF oversight, the RCA defers to an RCA-created entity (AUSAC)[55] to administer the AUSF. AUSAC operates under the guidance of a board consisting of different factions of Alaska's wireline industry.[56] With regard to contributions, the RCA does not review contributing carriers' jurisdictional allocations or otherwise verify reported revenues. As for disbursements, distribution levels and the underlying AUSF surcharge are proposed by an AUSAC tariff filing subject to RCA approval

[51] Noncompetitive areas – Alaska's highest cost and most rural exchanges – receive no COLR support. Incumbent LECs in non-competitive markets receive CCL support and participate in an access charge pool to recover non-CCL access costs from IXCs through an annual access charge process. Currently there are 11 rural carriers remaining in the access charge pool.

[52] Total statewide NAF collections are not reported to the RCA, and thus the above NAF collection amounts significantly understate total NAF collections in Alaska. NAF must be collected by any wireline LEC operating in Alaska. *See* AIIACM Section 109(a). The NAF collection amount of over $11 million stated above is derived from annual COLR support filings by COLR recipients who must report NAF and CCL revenues to determine the COLR support amount. This amount does not include NAF collections by carriers who do not receive COLR support (i.e., ACS of Anchorage, competitive wireline LECs such as GCI, and incumbent wireline LECs serving non-competitive markets (Adak Telephone, Alaska Telephone Company, Bettles Telephone, Bristol Bay Telephone, Nushugak Telephone, OTZ Telephone, Summit Telephone, United Utilities, United-KUC, Yukon Telephone)).

[53] *See* TA25-998, Alaska Universal Service Fund 2018 Surcharge Factor and Administrative Costs, filed October 2, 2017, *and* Letter Order # L1700477, dated November 15, 2017 (approving proposed surcharge factor and AUSAC 2018 operating budget).

[54] *See* TA25-998, Alaska Universal Service Fund 2018 Surcharge Factor and Administrative Costs, filed October 2, 2017, at Schedule 10.

[55] Alaska Universal Service Administrative Company. *See* 3 AAC 53.310.

[56] According to by-laws approved by RCA Order U-08-097(2), the AUSAC Board consists of seven members that include representatives of incumbent LECs (two members), facilities-based IXCs not affiliated with ILECs (two members), competitive LECs (one member), IXCs affiliated with ILECs (one member), and telecommunications members not otherwise represented (one member). *See* AUSAC By-laws Article III Section 3.2, Article X. The current AUSAC website currently lists a wireless industry representative; however, the listed representative works for ACS, a company that no longer has a wireless affiliate. Source: AUSAC website, October 21, 2017.

that is typically submitted on an annual basis, although AUSAC may request midcourse corrections as frequently as every quarter.[57]

Following intrastate access charge reform, AUSF budgets and surcharge filings were not generally subjected to extensive review, however this approach changed in August of 2015 after AUSAC filed a midcourse correction requesting to increase the AUSF surcharge to 15.2%, citing unanticipated carrier credits and the continuing decline of intrastate revenues.[58] When annual carrier filings were subsequently submitted in August 2015, the RCA cited the growth of the AUSF and mature competitive conditions in specified markets and suspended COLR payments to incumbent LECs operating in Juneau and Fairbanks (ACS affiliates) and Matanuska-Susitna (Mat-Su) Borough (MTA).[59] The RCA subsequently discontinued COLR payments in Juneau and the Mat-Su Borough, citing authority in COLR regulations to terminate COLR support where competitive conditions or other relevant factors indicate a COLR is no longer necessary.[60] Affected carriers appealed on both procedural[61] and constitutional grounds.[62] The RCA has since suspended the 2016 AUSF funding request filed for the Fairbanks market to consider eliminating COLR support in that market.[63] As of the date of this report, a stay on the RCA's decision to eliminate COLR support for MTA was granted by the district court, and a similar stay issuance on ACS-AK discontinued COLR support is likely. RCA staff project that the outlays from the AUSF needed to cover discontinued COLR support to MTA and ACS-AK are likely to push the AUSF surcharge above 18%.[64]

---

[57] *See* 3 AAC 53.340(d).

[58] July 13, 2016 RCA Public Meeting Transcripts at 15-23. Carrier credits totaling $938,000 were required after contributing carriers revised previously submitted intrastate revenue reporting.

[59] *See* Orders U-16-069(1) (Mat-Su Borough), U-16-070(1) (Fairbanks), and U-16-071(1) (Juneau).

[60] *See* Order U-16-069(7) (Mat-Su Borough) and U-16-071(7) (Juneau). 3 AAC 52.345(h) addresses the withdrawal of COLR status or termination of COLR support and provides:

> (h) Notwithstanding (a), (b), (f), and (g) of this section or the provisions of 3 AAC 53.265, the commission upon a petition or its own motion may withdraw carrier of last resort status or may terminate carrier of last resort support provided to a local exchange carrier serving a portion or all of the study area if the Commission determines after notice and hearing that a local exchange carrier of last resort is no longer needed in that area due to competitive conditions or other relevant factors.

[61] After the RCA issued a tentative decision to terminate COLR support and invited briefings, the affected carriers argued for either an evidentiary hearing or a rulemaking proceeding. *See* Docket U-16-069, MTA October 18, 2016 *Motion to Dismiss*; MTA January 19, 2017 *Response to Initial Impression* at 25-32; *see also* Docket U-16-070, ACS October 4, 2016 *Motion to Dismiss*; ACS January 31, 2017 *Response to RCA Initial Impression*.

[62] Constitutional arguments included that the RCA violated due process rights by terminating COLR support without an evidentiary hearing or administrative rulemaking procedure, violated equal protection rights by treating affected carriers differently than other similarly situated carriers, and possibly confiscated carrier property without just compensation. MTA October 18, 2016 *Motion to Dismiss*; ACS October 4, 2016 *Motion to Dismiss*.

[63] Orders U-17-080(1) (ACS of Fairbanks) and U-17-081(1) (ACS of the Northland), dated July 31, 2017. Those proceedings were still pending at time the memo was prepared.

[64] [($27,179,002 estimated total AUSF support in TA25-998 + ($232,975 MTA monthly COLR support x 17 months)) / $171,650,723 estimated intrastate revenues] = 18.14% AUSF surcharge with MTA COLR support built back in for 2018 as of August 1, 2017.

[($27,179,002 estimated total AUSF support in TA25-998 + ($232,975 MTA monthly COLR support x 17 months) + ($68,624 ACS-AK monthly COLR support x 17 months)) / $171,650,723 estimated intrastate revenues] = 18.82% AUSF surcharge with MTA and ACS-AK COLR support built back in for 2018 as of August 1, 2017.

2. Telecommunications Relay Service Fund

The RCA administers an additional subsidy program separate from the AUSF program. Mandated by state statute, Telecommunications Relay Service (TRS) is a program designed to assist persons with hearing or speech disabilities in placing and receiving telephone calls. TRS providers are selected to provide service under state and federal funding, ensuring no additional costs to TRS end users. State TRS is funded by a monthly universal service surcharge (separate from AUSF) collected by wireline LECs on each access line.[65] State TRS revenues and expenditures are also shown on Appendix D.

Infrastructure Deployment Funding/Market Oversight (Other State Approaches)

Recent studies conducted by NRRI[66] discuss state legislative and regulatory approaches towards modern network oversight, including reviewing state roles regarding broadband deployment.[67] One study summarized state broadband deployment efforts by stating:[68]

> The States have met the challenge of increasing broadband deployment and adoption through a variety of initiatives, including direct funding, partnering across state agencies and industry to fund broadband build-out, "retooling" state USF to include broadband deployment programs like Lifeline, and refocusing existing universal service funds from voice support to broadband build out, particularly in those areas where competition allows the state to divert high cost funds from subsidizing incumbent carriers to supporting broadband deployment.

A. State Universal Service Fund Approaches

The AUSF program includes programs designed to serve the public interest (Lifeline and PIPT), compensate competitive wireline LECs for access charge revenue reductions (CCL), and provide high cost support (DEM and COLR). AUSF support is based on historical carrier costs, with no performance obligations or cost review involved. Alaska is somewhat unique among states with universal service funds as the majority of high cost support (COLR) is focused on competitive rather than non-competitive markets. The RCA also has a separate TRS program to benefit consumers with impaired hearing or speech, and allows Alaskan wireline LECs to recover a separate NAF end-user assessment to offset access revenue reductions.

Universal service program objectives in other states include providing revenues to offset intrastate access charge reductions, promote broadband deployment measures, support high cost areas, and fund public interest programs (TRS, E-rate, Lifeline, and PIPT).[69] The majority of states limit high cost support to COLRs, with several states further limiting high cost support to areas without competition and/or

[65] 3 AAC 51.040(e), (f). It should be noted that CSSB 80 (L&C) passed the Senate on April 17, 2017, and is awaiting action by the House Labor and Commerce Committee, and would expand the assessment of the TRS surcharge to wireless and VoIP access lines.

[66] NRRI is the research arm of the National Association of Regulatory Utility Commissioners (a membership of state regulatory commissions), with the organization's mission being to produce and disseminate relevant research to assist in state commission decision-making.

[67] *See Carrier of Last Resort: Anachronism or Necessity*, S. Lichtenberg, NRRI Report No. 16-06 (July 2016); *The Year in Review 2016: Moving Past Reduced Regulation*, S. Lichtenberg, NRRI Report No. 16-06 (December 2016); *Broadband Availability and Adoption: a State Perspective*, S. Lichtenberg, NRRI Report No. 17-03 (June 2017).

[68] *Broadband Availability and Adoption: a State Perspective*, S. Lichtenberg, NRRI Report No. 17-03 (June 2017).

[69] *State Universal Service Fund 2014*, S. Lichtenberg, NRRI Report No. 15-05 (June 2015) at 12. A pie chart from this study that summarizes state USF by fund type is attached as Appendix 1.

requiring providers to charge rates above benchmark levels to receive state USF.[70] States pursuing broadband initiatives often divert high cost support in competitive areas away from subsidizing incumbents to supporting broadband deployment.[71] Broadband funding oversight differs, with some states creating broadband councils separate from state regulatory commissions to administer broadband grants and other states having state regulatory commissions run broadband programs.[72]

An increasing number of states have redirected state universal service funding to support broadband deployment, refocusing state USF from voice service support to broadband network build-out. Recent state legislative initiatives to advance broadband service include designating broadband as a state-supported service for universal service funding purposes, allowing broadband deployment by municipal governments where private industry has not deployed, and providing broadband deployment tax credits.[73] States also use measures to encourage private-public partnerships, such as requiring matching funds.

B. State Network/Market Oversight Approaches

States diverting their USF from supporting carriers to promoting broadband often look to also reduce regulatory oversight of historically regulated wireline LECs and IXCs, with legislative action often changing regulatory paradigms.[74] The RCA regulatory presence in Alaskan telecommunications markets is already minimal, mainly consisting of tariff filing requirements and limited industry reporting requirements. RCA network oversight is limited to service outage reporting and the annual filing of interexchange (middle mile) maps. On the rate side, regulated carriers essentially operate under rate caps based on revenue requirements approved ten or more years ago. Other than publicly traded companies such as ACS and GCI (who file or provide a link to SEC Form 10-K filings), carrier revenue and expense reporting requirements at the state level are limited to highly aggregated revenue and expenditure information.[75]

Alaskan providers have advocated for relaxed regulation in the past, with at least one Alaskan provider requesting relief from LEC COLR obligations (particularly where RCA eliminates LEC COLR support).[76] COLR obligations may be generally characterized as serving all customers within the service area (extending facilities when necessary), obtaining regulatory approval before discontinuing service,

[70] There are various approaches to benchmark rates, with benchmarks based on carrier costs, state-wide average service costs, household income levels, or the FCC benchmark rate. Some states use different benchmark rates for residential and small business customers.

[71] *Broadband Availability and Adoption* at v, 21-52.

[72] State initiatives have included creating broadband task forces and councils to monitor and improve service deployment, conducting studies to identify areas lacking broadband, creating private/public partnerships to increase service availability and adoption. Councils and task forces operating outside state regulatory commissions often depend on state commissions for USF funding. *Id.* at 21.

[73] *Broadband Availability and Adoption* at 31-.32

[74] This topic is discussed in detail in *The Year in Review 2016: Moving Past Reduced Regulation*, with the report noting 41 states reduced or eliminated regulatory oversight of wireline telecommunications service by 2016, with deregulation initiatives accomplished through legislation or commission action.

[75]Federal USF recipients file granular information to track broadband deployment at the census block level, a filing that federal rules require be submitted to the state regulatory commission.

[76]ACS recommended to the FCC that local carriers be relieved from COLR obligations in locations where they have not accepted USF support, and be allowed to petition state commissions for COLR relief where the state does not ensure adequate revenues are available to compensate the carrier for fulfilling service obligations. *Comments of Alaska Communications Group, Inc.*, filed January 18, 2012 in *In the Matter of Connect America Fund,* WC Docket 10-90 *et al.*

charging just and reasonable rates, exercising due care when providing service, and providing intercarrier services.[77] RCA regulations also provide for more granular LEC and IXC COLR obligations.[78]

Many states have modified or eliminated COLR obligations in recent years, with states questioning whether COLR duties should be required.[79] Some states eliminated COLR responsibilities by legislation (no longer requiring carriers to extend basic local service upon request, but still requiring carriers to obtain approval before exiting markets). States reducing or modifying COLR obligations used measures such as limiting COLR duties to areas without competition, allowing COLRs to provide service using any technology, or providing paths to eliminating COLR status (focused on meeting service quality metrics). Some states allow carriers to opt out of COLR duties in markets where competitive alternatives (any technology) exist, while others limit COLR requirements to areas where there is no or limited competition and where carriers accept state USF. Some states limit COLR obligations to markets below a certain size, measured by population size or line counts.[80]

Aside from COLR reform, additional questions remain regarding appropriate level market oversight in modern communications markets. ACS previously argued for eliminating tariff filing requirements, an argument raised in Docket I-17-004 by AT&T Alaska, the IXC COLR for most of the state.[81] Many states have deregulated retail telecommunications in whole or in part, focusing state commission oversight on intrastate network access, wholesale and other carrier-to-carrier services, and the availability and reliability of emergency and Lifeline services. States deregulating retail service may maintain limited authority over service quality and consumer complaints, with some states limiting such oversight to essential (basic local) telecommunications service. Areas that maintain basic local service oversight often allow service provision by any technology, including VoIP.

National studies discuss possible approaches to state market regulation in the broadband era, with a "best practices" method suggested. NRRI recommended state commissions pursuing deregulatory measures continue to evaluate telecommunications markets, addressing market problems that may arise. NRRI recommended four guiding policies when evaluating markets: (1) analyze competition on an exchange-by-exchange basis, (2) focus on health and safety, (3) collect and evaluate customer complaints, and (4) participate in the Broadband Lifeline program to identify areas for improvement and track customer adoption.[82]

Infrastructure Deployment (Previous Alaska Broadband Study Recommendations)

The State of Alaska convened a Broadband Task Force (BBTF) in 2011, charged with developing plans to accelerate broadband deployment, availability, and adoption in Alaska.[83] BBTF established an optimistic goal of deploying 100 Mbps service to every Alaskan household, citing a cost of over $1

[77] *See supra* at footnote 4, citing *Carriers of Last Resort: Updating a Traditional Doctrine at* 4-14. The explanation above focuses on LEC COLR obligations. It should be noted that Alaska is unseal in that it also has IXC COLR obligations.

[78] 3 AAC 53.265(i) specifies essential LEC retail service requirements for LEC COLR, while 3 AAC 3.265(j) specifies essential carrier-to-carrier duties for LEC COLRs. Requirements for IXC COLRs are specified at 3 AAC 52.381(b), with IXC COLRs also required to file annual network information by 3 AAC 52.381(c).

[79] *Carrier of Last Resort: Anachronism or Necessity* at *vi*.

[80] A table from this study that summarizes the way COLR obligations have been limited is attached as Appendix 2.

[81] *AT&T Alaska September 8, 2017 Response* at 6.

[82] *The Year in Review 2016: Moving Past Reduced Regulation* at v-vi, 38-42

[83] *A Blueprint for Alaska's Broadband Future: A Report From the Statewide Broadband Task Force* (October 2014)

billion.[84] Preferred infrastructure methods were identified, with the order of priority being fiber microwave, and then satellite. Last mile was also identified as an area that should be funded when federal programs are insufficient. BBTF recommendations included establishing a broadband policy agency, establishing public-private partnerships to accelerate broadband deployment, and streamlining permitting processes for broadband deployment issues in Alaska.[85]

Mapping and Other Resources

A. Middle-Mile Facilities Map

The Legislature's appropriations language requested information on Alaska's current and future broadband coverage, as well as an analysis of gaps in infrastructure and financing.[86] The Commission requested information from broadband service providers, entities that own or control facilities capable of carrying broadband traffic, and interested persons to assist the Commission in preparing a response to the Legislature's inquiry.[87] The Commission requested specific information relating to middle-mile facilities.[88]

The responses essentially directed Commission Staff (Staff) to public mapping resources, with at least one commenter noting that there is no map that reflects all middle mile facilities in Alaska[89] Staff therefore, endeavored to create one by pooling various public maps. Using the Commission's ArcMap mapping tool, Staff developed a middle-mile facilities map depicting fiber, microwave, and satellite facilities of carriers in Alaska.[90]

It should be noted that access to broadband Internet service are most closely correlated with access to terrestrial middle mile facilities (fiber and microwave), and unfortunately, areas of Alaska that rely on

[84] The magnitude of this goal is demonstrated by reference to the current federal broadband definition. 2016 standards are 25 Mbps down/3 Mbps up for fixed services, up from 10Mbps/1Mbps in 2015. Alaska Plan and ACS CAF awards require service levels of 10/1 Mbps and 25/3Mbps, with reduced service levels of 1 Mbps/256kbps applicable where terrestrial backhaul facilities are unavailable.

[85] Commenters in I-17-004 also suggested the RCA advocate for streamlining permitting processes and reducing permit costs and fees. *See e.g.*, Rural Coalition September 8, 2017 comments at 6; KPU September 5, 2017 comments at 6; AT&T Alaska September 8 2017 comments at 6.

[86] CCS HB 7, Section 1 (Chapter 1 SSSLA 17).

[87] *See* Order I-17-004(1), *Order Opening Docket and Requesting Information*, dated August 9, 2017 (Order I-17-004(1)).

[88] Order I-17-004(1) at 4.

[89] Further, Alascom, Inc. d/b/a AT&T Alaska (AT&T Alaska) and GCI Communication Corp. d/b/a General Communications, Inc. and GCI (GCI) referenced their long distance network map annual filing with the Commission under 3 AAC 52.390(o). AT&T Alaska's network map is available online at http://www.corp.att.com/alaska/regdocs/Alaska_System_Map_LR.pdf. Alaska Communications System (ACS) filed a network map showing the company's undersea and terrestrial fiber optic cable middle mile infrastructure. GCI provided a website showing its fiber microwave network http://www.alaskaunited.com/route/ and TERRA network, which includes planned expansion in 2017 (http://terra.gci.com/maps-locations). The Rural Coalition (RC) referenced a middle mile map filed by the Alaska Telephone Association (ATA) to the FCC that contains the best reflection of facilities in the state as of 2015. The ATA filing is available at https://ecfsapi.fcc.gov/file/60001326120.pdf. Further, the RC states there is no map that reflects all middle mile facilities.

[90] *See* Appendix A, Middle Mile Maps.

satellite middle mile will generally have slower Internet offerings available at higher relative cost. Therefore, the middle mile facilities map created by Staff is a particularly helpful tool for visually depicting current service and network gaps.

B. Broadband Coverage Map

As part of its efforts to respond to the Legislative inquiry, the Commission required broadband service providers to file separate coverage maps of the broadband services they offer over different types of facilities: terrestrial (such as fiber, coaxial, copper, and microwave), wireless, and satellite. For wireless providers, the Commission required the providers to indicate coverage areas of varying connectivity (i.e., 2G, 3G, 4G, and 5G) and to provide an electronic version of the maps, preferably in GIS shapefile format. Two wireless Internet service providers (WISPs) provided a link that shows their broadband coverage areas and one satellite service provider filed a broadband service coverage map.[91] Most of the other responses directed Staff to the FCC Form 477 broadband connection webpage.[92]

1. *FCC Mobile Wireless Broadband Coverage Map*

The Federal Communications Commission (FCC) requires facilities-based providers of broadband connections to end users to provide information about broadband connections to end-user locations, wired and wireless local telephone services, and interconnected VoIP services using the FCC Form 477.[93] The FCC uses the data obtained from the FCC Form 477 to describe the deployment of broadband infrastructure and competition to provide local telecommunications services. The forms must be filed twice a year: **March 1st** of each year with data as of December 31 of the preceding year and **September 1st** of each year containing data as of June 30 of the current year.

The FCC required mobile wireless broadband providers to submit polygons in a shapefile format representing geographic coverage nationwide for each transmission technology deployed in each frequency band.[94] The data associated with each polygon should indicate the minimum advertised upstream and downstream data speeds associated with that network technology in that frequency band, and the coverage area polygon should depict the boundaries where users should expect to receive those advertised speeds. If the broadband provider does not advertise the minimum upstream and/or downstream data speeds, then the provider should indicate the minimum upstream/downstream data speeds that users should expect to receive within the polygon depicting the geographic coverage area of the deployed technology in the given frequency band.

The wireless deployment data per census block collected from the FCC Form 477 is found at https://www.fcc.gov/mobile-deployment-form-477-data. The latest data is based on information provided by mobile wireless broadband providers as of **December 31, 2016**. The data contains

[91] SpitwSpots current coverage map can be viewed at: http://sites.towercoverage.com/Default.aspx?mcid=5345&Acct=8046, Borealis Broadband's coverage map can be viewed at http://www.borealisbroadband.net/coverage/. ViaSat filed its broadband coverage map, attached hereto as Exhibit 1 - ViaSat Coverage Map.

[92] https://www.fcc.gov/general/form-477-resources-filers.

[93] *See* https://transition.fcc.gov/form477/WhoMustFileForm477.pdf.

[94] *See* FCC Form 477 reporting instructions at https://transition.fcc.gov/form477/477inst.pdf. Page 32 shows the technology deployed and frequency band codes.

shapefiles that could be projected onto a mapping program to show wireless coverage per census blocks.[95]

Using QGIS,[96] a free open-source mapping program, Commission Staff projected the most recent, publically available shapefiles filed by eight mobile carriers – Arctic Slope Telephone Association Cooperative (Wireless), AT&T Mobility, Copper Valley Wireless, Inc., Cordova Wireless, GCI Communication Corp., MTA Wireless,[97] TelAlaska Cellular, Inc., and Verizon Wireless – with the FCC.[98]

2. *FCC Fixed Broadband Map*

The FCC has a map showing where fixed broadband services of at least 25 megabits-per-second (Mbps) download and 3 Mbps upload is deployed as of June 2016.[99] The map includes a graph that shows the fraction of population with or without access to this level of broadband, a list of providers that offer residential services in a census block area, each provider's maximum advertised residential speed, and demographic data for the county associated with the census block. However, the FCC's fixed broadband map is over a year old and does not show broadband service on a community-by-community basis.

Further complicating the utility of this map for purposes of the Legislature's information request is that the information is limited to Internet connectivity of speeds of 25Mbps/3Mbps, a level of service that is not achieved in many non-urban areas in Alaska. What the map does demonstrate, in stark relief, is how much of the geographic area of Alaska does not currently have what the FCC considers to be a minimum level of broadband connectivity, which is helpful in relating the enormity of the problem the Legislature is trying to understand.

3. *Other Coverage Resources: FCC Form 477 Datasets*

The FCC has datasets, in Microsoft Excel format, of fixed broadband service per state that show the providers' names, type of technology used (e.g. satellite, fiber, copper, cable modem, etc.) and advertised residential speed. Using the FCC's Form 477 datasets for Alaska, GCI filed a table showing fixed broadband download speeds by census place name and by provider compiled from the FCC Form 477 data as of **December 31, 2016**.[100] The Alaska dataset from the FCC Form 477 contains voluminous information, including the name of service providers, census block codes and maximum advertised

---

[95]The shapefiles are located at https://www.fcc.gov/form-477-mobile-voice-and-broadband-coverage-areas.

[96]QGIS can be downloaded at http://qgis.org/en/site/forusers/download.html. The FCC provided instructions how to use QGIS to create geographic representation of wireless broadband coverage (*see* https://transition.fcc.gov/form477/Geo/finding_census_blocks_in_qgis.pdf). After installing QGIS, the 2010 census block geographic data must also be downloaded from https://www.census.gov/geo/maps-data/data/tiger-line.html.

[97]MTA Wireless no longer provides wireless service (*see* https://www.mtasolutions.com/ and http://www.frontiersman.com/news/mta-continues-transitioning-out-of-cell-phone-service/article_23f3f454-cfbf-11e6-838f-8fae1c96bf09.html).

[98]*See* Appendix E – Wireless Broadband Coverage Map.

[99]*See* https://www.fcc.gov/maps/fixed-broadband-deployment-data/.

[100]GCI's table is attached as Exhibit 2 – GCI's Compilation of Form 477 Broadband Coverage Data by Alaska Community. GCI extracted the data from https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477.

speeds in those census blocks.[101] However, the data does not include a list of communities served and population making it less user-friendly for consumers and policymakers

GCI, however, undertook the task to build the table that would be useful to the Commission and the public by combining census block locations and associating them with the place name and the population of each community. As a result, the table clearly shows the advertised speed by the provider in a specific community. A few caveats: First, note that the table includes satellite broadband speeds for nearly every community in Alaska, which may give false impression that almost any community has access to some form of satellite broadband connection. The commenters noted hurdles in obtaining satellite broadband service including finding ground equipment installers and support services and terrain issues that might impede service given the low elevation angles needed to acquire satellite signals at high latitudes.

Second, also note that the table does not include pricing for Internet service, and it represents the maximum speed available in at least one location in a census block associated with a given community. Therefore, it is possible that not every location within a given census block or community has the same access to broadband as listed in the GCI filing. And perhaps more importantly the maximum speed available in the 477 data may not be offered to the general public for what the Commission or consumers in Anchorage, for instance, may consider to be a reasonable price.

Broadband Pricing Resources

The Commission requested service providers to provide a link to the price lists for various broadband services they offer.[102] Exhibit 3 – Alaska Broadband Pricing Data shows the current pricing (with advertised speeds and data limits as applicable) for Internet services from broadband providers in Alaska. The exhibit provides hyperlinks to the providers' websites to allow further exploration of the prices and packages available across Alaska.

It should be noted that the pricing data depicted in Exhibit 3 may or may not provide community-level access to a particular service offering – several websites surveyed expressly make this disclaimer. It is possible a consumer in a particular location cannot subscribe to a particular service offering for a variety of reasons. Public testimony from several individuals offered at various public meetings held in preparation for this report that related stories of continued denial by providers to extend broadband service despite the close proximity of broadband capable facilities – punctuated by one individual that stated that a provider had denied him broadband service even as it trenched fiber across a right-of-way on the individual's property.[103] Another individual testifying telephonically at the November 29, 2017, public meeting stated that his voice and Internet bundle provider now require him to view his combined bill for bundled service on the provider's webpage, which he claims takes five or more minutes to load at the Internet download speed offered at his residence, despite living less than two miles from downtown Fairbanks.

[101] *See* https://www.fcc.gov/form477/BroadbandData/Fixed/Dec16/Version%201/AK-Fixed-Dec2016.zip

[102] Order I-17-004(1) at 3.

[103] Appendix F – Compilation of Relevant Public Testimony Offered by Consumers at RCA Public Meetings.

Ongoing FCC Filing Requirements

Other than filing the FCC Form 477 mapping and service offering data, recipients of federal high-cost support are required to submit additional information. It should be noted that the reporting and mapping obligations tethered to the various federal high cost support models discussed are just beginning to ramp up, meaning the Commission's report did not benefit from the data that will soon be available. This granular data, especially the geocoded service locations that will be reported to the FCC, discussed below, should provide a clearer picture of broadband deployment in Alaska over the next ten years, and should help tremendously to further flesh out answers to the questions in the Legislature's appropriation language.

A. Connect America Fund Phase II

On October 24, 2016, under the Connect America Fund Phase II (CAF II), ACS was awareded frozen support of $19,694,208 annually from January 1, 2016 to December 31, 2025, to deploy broadband to at least 31,571 locations.[104] The FCC adopted 10/1 Mbps as the minimum broadband speed requirement for deployment of broadband services to a specified number of locations in the ACS service territory and as a condition of receiving frozen support. Further, the FCC required ACS to submit geocoded locations of newly deployed facilities to Universal Service Administration Company (USAC) every **March 1st**, and separately identify the number of locations where it is offering speeds of at least 10/1 Mbps or 25/3 Mbps.[105]

B. Alaska Plan

On August 23, 2016, under the Alaska Plan, the majority of rate-of-return local exchange carriers and their wireless affiliates, as well as GCI, were awarded fixed amounts of support over the next ten years to deploy and maintain their fixed and mobile networks.[106] Under the Alaska Plan, the Alaska carriers would bring broadband to as many as 111,302 fixed locations and 133,788 mobile consumers at the end of the 10-year term.[107]

As a condition for receiving federal high cost support under the Alaska Plan, starting on **March 1, 2018** and every **March 1st** thereafter, Alaska Plan recipients are required to submit to USAC the geocoded locations for which they have newly deployed or upgraded broadband meeting the minimum speeds in their approved performance plans and their associated speeds.[108] Note that the carriers participating in

---

[104] *See* Connect America Fund Order, WC Docket No. 10-90, FCC 16-143, released October 31, 2016 (https://ecfsapi.fcc.gov/file/10312535028273/FCC-16-143A1.pdf) (ACS CAF II Order).

It should be noted that "locations" associated with the various high cost support obligations detailed in this report refer not to collective communities, but rather to individual residences, businesses, or premises the various providers' networks are capable of serving at the indicated benchmark service level.

[105] ACS CAF II Order at ¶¶50–52.

[106] *See* Alaska Plan Order, WC Docket No. 10-90, WT Docket No. 10-208, WC Docket No. 16-271, FCC 16-115, released August 31, 2016 (https://ecfsapi.fcc.gov/file/0831056301771/FCC-16-115A1.pdf) (Alaska Plan Order).

[107] *See* FCC Public Notice DA 16-1425 (https://ecfsapi.fcc.gov/file/12212564530462/DA-16-1425A1.pdf) and DA 16-1419 (https://ecfsapi.fcc.gov/file/122165550991/DA-16-1419A1.pdf), released December 21, 2016, approving Alaska Plan support and deployment plans for rate-of-return carriers and wireless providers, respectively.

[108] Alaska Plan Order at ¶¶57–59.

the Alaska Plan did not have access to USAC's reporting portal until November 9, 2017, so this high detail, granular data was not available for purposes of this report.

The FCC also required Alaska Plan participants to submit fiber network maps or microwave network maps in a format specified by the Bureaus covering eligible areas and to update such maps if they have deployed middle-mile facilities in the prior calendar year that are or will be used to support their service in eligible areas.[109]

C. Alternative Connect America Fund

On March 23, 2016, the FCC adopted an alternate high-cost funding mechanism that would allow rate-of-return carriers to elect to receive model-based support in exchange for deploying broadband-capable networks to a pre-determined number of eligible locations.[110]

Alaska Power and Telephone Company (AP&T) and Summit Telephone & Telegraph Company of Alaska, Inc. d/b/a Summit Telephone Company (Summit) are the two rate of return local exchange carriers that elected to receive federal high cost support under the Alternative Connect America Cost Model fund (A-CAM) to deploy broadband to at least 8,794 locations.[111] Rate-of-return carriers receiving high cost support under the A-CAM are required to submit to USAC the geocoded locations for which they have newly deployed or upgraded broadband at specified minimum speeds in their approved performance plans every **March 1st**.[112] Further, the carriers are required to file geocodes for pre-existing broadband-capable locations, with such information required to be submitted to USAC no later than **March 1, 2019**.[113]

Future Broadband Facilities Deployment

In response to the Commission's docketed questions, the carriers participating in the A-CAM, Alaska Plan, and CAF II emphasized their federal high cost support commitments. ACS notes that the CAF II broadband expansion plans are under development and will mainly be in the Fairbanks area and on the Kenai Peninsula with pockets of new broadband service in other locations that ACS serves. ACS provided broad-view maps of these planned areas of expansion.[114]

GCI referenced FCC Public Notice DA16-1419 for the wireless broadband expansion plans, and its 2017 Annual ETC Report for the wireline broadband expansion plans.[115] The RC companies note their

[109]Alaska Plan Order at ¶60 and ¶102.

[110]*See* Alternative Connect America Cost Model Order, WC Docket No. 10-90, WC Docket No. 14-58, CC Docket No. 01-92, FCC 16-33, released March 30, 2016 (https://apps.fcc.gov/edocs_public/attachmatch/FCC-16-33A1.pdf) (A-CAM Order).

[111]*See* FCC Public Notice DA 17-99, released January 24, 2017 (https://ecfsapi.fcc.gov/file/0124726018461/DA-17-99A1.pdf).

[112]A-CAM Order at ¶210 and ¶216.

[113]A-CAM Order at ¶213.

[114]*See* Exhibit 4 – ACS CAF II Potential Coverage Map.

[115]*See* Exhibit 5 – Map Excerpts from GCI's 2016 ETC Report Detailing Future Wireline Facilities Expansion.

broadband commitments under the A-CAM and the Alaska Plan, and provided photos of their current expansion projects.[116]

In response to Order I-17-004(1), several satellite providers described their expansion plans. WorldVue Satellites Limited d/b/a OneWeb will partner with mobile network operators, ISPs and other organizations to help extend their coverage, providing seamless, affordable broadband to schools and to rural and remote areas worldwide. OneWeb claims to be the first and only funded low-Earth-orbit non-geostationary satellite orbit fixed-satellite service (LEO NGSO FSS) system to obtain access to the U.S. market (in June of 2017) and is on track to begin launching its first satellites next spring, after which OneWeb will begin enabling commercial services through its partners across Alaska in 2019.

ViaSat, Inc. (ViaSat) is expanding to Europe and has plans to be a global high-speed internet service provider in the near future. ViaSat's ViaSat-2 satellite launched June 1, 2017, and commercial service from that satellite is expected to start during the first quarter of 2018 over North America, Central America, the Caribbean, a portion of northern South America, as well as the primary aeronautical and maritime routes across the Atlantic Ocean between North America and Europe. ViaSat-2 has more than 300 Gigabits per second of total network capacity and will significantly improve ViaSat's broadband service speeds (e.g., 50, 100 Mbps) and allow for service plans with no data caps. Further, expected to begin 2019, ViaSat will launch the first of three satellites, referred to as the "ViaSat-3 satellites" in an effort to provide global broadband coverage and is expected to increase broadband coverage over the southeastern portion of Alaska. The first ViaSat 3 satellite will launch over the Americas likely in 2019 and the second ViaSat 3 satellite over the Europe, Middle East, and Africa regions is anticipated in 2020. The third ViaSat-3 satellite will provide service in the Asia-Pacific market. Each ViaSat 3 satellite is anticipated to have as much bandwidth as all the rest of the satellites currently in-orbit and under construction combined.

Hughes Network Systems, LLC (Hughes) Gen5 started providing 25/3Mbps service in March 2017, following the launch of the EchoStar XIX satellite in December 2016. Hughes continues to work with its local dealers in Alaska to rapidly implement this new service offering. Additionally, Hughes is in the process of designing and constructing its next-generation, high throughput broadband satellite, which will offer speeds of approximately100 Mbps to consumers throughout the United States. In addition, Hughes is an investor in OneWeb that is anticipated to begin providing high-speed, low-latency broadband service throughout Alaska, as early as 2019.

Space Norway acquired access to the U.S. market for a proposed NGSO FSS satellite system, known as Arctic Satellite Broadband Mission (ASBM), including service to Alaska.[117] Attached as Exhibit 7 is a presentation of Space Norway's ASBM project provided to the commission courtesy of the Alaska Telephone Association (ATA).

SpitwSpots, Inc., a wireless Internet service provider (WISP), stated to the Commission its plans to continue expansion in step with improvements to fiber and microwave middle mile infrastructure, as well as efforts to work with other WISPs across the state to increase coverage.

[116] *See* Exhibit 6 – Rural Coalition Broadband Deployment Project Narratives.

[117] *See* Space Norway Order, IBFS File No. SAT-PDR-20161115-00111, released November 3, 2017 (http://transition.fcc.gov/Daily_Releases/Daily_Business/2017/db1103/FCC-17-146A1.pdf)

Gaps in Funding and Service

GVNW Consulting, Inc. (GVNW) and Vantage Point Solutions (Vantage) conducted a study of middle mile availability and the cost of completing middle mile rings in Alaska to achieve the goals as envisioned in the Alaska Broadband Task Force Report. To provide terrestrial broadband service to all communities in Alaska, the study advocates building a hub-and-spoke ring type network consisting of fiber and microwave around the entire state, with anchor cities connected to the ring network and branches to smaller communities. The study projects a total cost of $1.6 billion.

Further, the study presumes that where there is no terrestrial middle facility to connect the community, that community would remain served by satellite. As discussed above, while satellite technology is projected to improve with augmented broadband capability, currently any location in Alaska served exclusively by satellite middle mile facilities will have diminished broadband Internet access relative to locations with terrestrial middle mile. The GVNW study is therefore another useful resource for assessing gaps in Alaska's broadband footprint that are expected to persist into the near future. Attached as Exhibit 8 is the GVNW and Vantage research provided courtesy of the RC.

ACS proposed a middle mile plan to the FCC in competition with the Alaska Plan advocated by the ATA. The ACS middle mile plan proposed to close the middle mile gap in Alaska, through the construction of a publicly funded middle-mile facility managed by a neutral administrator. ACS estimated approximately $610 million would be needed for the construction of new fiber and microwave facilities and $30 million to upgrade existing microwave middle-mile systems over a period of ten years. The FCC ultimately rejected the ACS middle mile plan,[118] which is attached as Exhibit 9. The proposal is nevertheless another useful assessment of the monies required and associated facilitating mechanisms needed to provide improved terrestrial middle mile in Alaska.

Acknowledging limitations to the middle-mile access, the FCC allowed certain Alaska rate-of-return carriers to maintaining existing Internet access at speeds below the required 10/1 Mbps level under the Alaska Plan. The Alaska Plan itself, therefore, is another resource for assessing gaps in service. However, the FCC noted that to the extent such limiting conditions have changed, these carriers should revise their deployment obligations and upgrade their existing service or deploy service to new locations.[119] As a practical example, Arctic Slope Telephone Association Cooperative (ASTAC) is currently limited to 4/1Mbps under the hybrid microwave-fiber middle-mile network that connects its service area. However, ASTAC will be able to significantly increase its service speed when Quintillion Subsea Cable System provides middle-mile access to ASTAC in the near future, which in turn will trigger Alaska Plan obligations to significantly augment service targets. The RCA was recently informed that Quintillion will turn up service as a wholesale provider starting December 1, 2017, in the communities of Nome, Kotzebue, Point Hope, Wainwright, and Utqiaġvik now that the initial Alaska portion of its multi-phase system has completed construction.

For their part, satellite service providers and WISPs contend that satellite internet can fulfill the needs of many rural communities given the improvements on the horizon, including low-earth orbiting (LEO)

[118] Alaska Plan Order at ¶¶ 71, 74 (stating "[a]s an initial matter, the ACS proposal would require changes to several different universal service mechanisms outside the scope of this proceeding, such as the rural health care and E-Rate mechanisms …[and] would involve significant implementation and operational issues regarding the proposed middle mile provider that, at a minimum, would lead to substantial delay and may well not be practical").

[119] *See* FCC Public Notice DA 16-1425 at 5 (https://ecfsapi.fcc.gov/file/12212564530462/DA-16-1425A1.pdf).

satellites that augment the constellation with numerous, small satellites that track closer to Earth, reducing latency associated with traditional geo-stationary satellites.

Microcom, however, states that the satellite industry has launched over 500Gbps of capacity over North America (Jupiter 2 and ViaSat 2), only 1Gbps of which reaches Alaska at a very low look angle. Other commenters responding to the Commission's inquiries in Docket I-17-004 expressed concern with the commercial viability of LEO constellations given Alaska's latitudinal location.[120] Whether satellite or some other more novel (and cheaper) solution to broadband gap that exists between disparate communities in Alaska will actually materialize in the near future is an open question, but given the dollar figures that go with deploying a terrestrial network estimated above, it appears that ViaSat's assertion that all technological options available should be considered to supply Internet service across the state, and that Alaska's Internet access policy recommendations should remain technology neutral is well put.[121]

Conclusion

The analysis presented in this legislative report is the culmination of many hours of work by RCA staff with the input of industry stakeholders, drawing from both groups' extensive knowledge and understanding of the regulatory field on which the broadband network is being built. It is also colored by the public testimony of Alaskan consumers that want and need broadband Internet access.

This report attaches several studies that demonstrate the costs associated with providing broadband Internet access throughout Alaska – costs that reach into the hundreds of millions and even billions of dollars. The pattern of settlement and geography in Alaska means that most communities are isolated, without road access, and surrounded by challenging terrain. This makes deployment of the terrestrial network facilities, currently required to provide broadband Internet access, not only a difficult technical proposition but potentially an unrealistic economic proposition unless massive subsidies are provided. The report notes anticipated advances in satellite technology and several entrepreneurial efforts to leverage those advances to deploy satellite constellations that might substantially reduce the cost of delivering broadband Internet service to rural Alaska in the future. Unfortunately, technological advances are not a guarantee and there is no magic bullet to providing broadband Internet access to remote Alaska. All middle mile and last mile solutions are going to have to be studied closely by both providers and policy-makers alike; and it is more than likely many hard decisions will have to be made regarding where and how scarce resources will be expended.

This report highlights the improved mapping and data requirements on the horizon that will help clarify the issues and how and where the recipients of federal support are planning to attack them. The RCA believes supplemental legislative reports, if requested, could flesh out in greater detail the communities that will receive improved Internet service, and those that will have to wait to determine when or if they will be served.

[120]Docket I-17-004, *Response of AT&T*, filed September 8, 2017 at 11 – 12.

[121]*I-17-004, Order No. 1 – Order opening docket and requesting information ("Information Docket")*, filed September 8, 2017 at 3.

The report details the annual stream of federal and state support that is currently provided to Alaska wireline and wireless carriers. These subsidies are substantial[122] and add to the revenue carriers receive for the provision of telecommunications services, including Internet service; despite this, the message the RCA is continually reminded of by these carriers is simple – the support is not enough to deploy broadband Internet statewide.

The report also identifies key blind spots in the RCA's knowledge of how the support carriers receive, including the state support the RCA supplies to carriers, is actually spent and what kind of profit margins ISPs operating in the state currently enjoy for providing Internet services. Many of these RCA regulatory blind spots are imposed by federal preemption over Internet service. As for state support, blind spots arise from how the AUSF regulations are currently drafted; and while rulemaking efforts are currently underway to reform the program, as the report notes, the AUSF suffers from the continued erosion of the intrastate revenues that are reported to AUSAC and against which the surcharge is levied which has created instability in the fund. Further, the RCA's adjudicatory efforts to begin to discontinue supporting carriers in competitive markets have met with court challenges. The unfortunate fact is that some of the voice customers that pay the resulting surcharge – anticipated to possibly increase to over 18% in 2018 – may not directly benefit from the way AUSF support is actually spent on improved broadband capable networks, raising clear equitable concerns with how the AUSF is currently structured.

Federal law and the FCC's interpretation of it preclude the RCA from assessing the AUSF surcharge against broadband Internet service, even as that service's users are the most likely beneficiaries of how AUSF support is currently spent. So while the RCA has a degree of expertise in, and limited jurisdiction over, the network deployed in Alaska to the extent the network carries intrastate telecommunications, the RCA is federally hamstrung when it comes to demanding and effecting meaningful improvements to broadband Internet service, aside directing financial support toward the issue.

The AUSF could be repurposed to make explicit what are now implicit subsidies of broadband capable network deployments. The RCA has discussed and explored the grant-making role into which several other states have transformed their respective state universal service funds. The report notes that still other states have initiated programs to support rural broadband deployment with general funds. In reviewing this report, however, the RCA urges the Legislature to keep not only the scope of the problems facing rural broadband deployment in mind – both the logistical and economic problems highlighted above – but also the inherent and specific problems with the AUSF, before rendering judgement on whether such a transition in the AUSF would make a meaningful impact on the problem without exacerbating inequity in which consumers pay and which consumers benefit. The RCA cautions that until its jurisdictional mandate is statutorily changed, either by Congress or by the Legislature, the RCA remains empowered to ensure that basic voice service is made universally available to Alaskans that want and need it. Until prospects to connect all Alaskans to next-generation telecommunications service are realistically achievable, the RCA cannot, and the Legislature should not, lose sight of the fact that even affordable voice service in some parts of Alaska is not something to be taken for granted.

[122] As noted in Appendix B, federal high cost support to Alaska wireline and wireless carriers through 2025 exceeds $1.6 billion. For additional context, the total federal non-high cost support provided to Alaskan carriers for the five-year period from 2012 through 2016 exceeded $389 million. Assuming no drastic changes to any of the non-high cost support programs by the FCC, it is reasonable to assume Alaska carriers may receive a combined federal subsidy in excess of $2 billion through 2025 based on historical projections. In addition, Appendix D details total state support to Alaska carriers, which has averaged just under $39 million annually in 2015 and 2016, and is subject to revision by the RCA.

In closing, despite the obstacles to affordably obtaining modern, high-speed internet access for all Alaskans discussed in the report, the RCA is nevertheless encouraged that the Legislature is focusing on a problem that risks creating what one member of the public from the Fairbanks area described as a group of second-class citizens that, due to the lack of access to broadband Internet service, are increasingly marginalized and foreclosed from meaningful participation not just in American commerce, but in education and citizenship. The RCA trusts this report will aid in the Legislature's future efforts. The RCA stands willing to offer its assistance.