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VIA ELECTRONIC MAIL

To: Jen Leasure, The Quilt

From: Jeff Mitchell

Re: **Monthly Broadband Policy Update – through December 30, 2020**

Capitol Hill

Although President Trump criticized the final $900 *billion* COVID-relief legislative package (containing both COVID-relief and an omnibus spending bill that averted a government shutdown) for providing too little financial relief to Americans and too much wasteful spending, on December 27 he signed the package into law.[1]

[1] President Trump used the Budget Control Act of 1974 to delay and request rescission of certain programs however, if Congress fails to act, the programs will eventually go into effect. Congress agreed to consider increasing payments to Americans from $600 to $2000 – with the House already passing legislation to that effect. The Wall Street Journal (subscription required) described some general aspects of the package as follows:

> Two pandemic-related unemployment assistance programs lapsed over the weekend and will restart now that Mr. Trump has signed the bill, but payments are likely to be delayed according to experts. The first program provided unemployment benefits for gig and contract workers and others who don't generally qualify for jobless aid. The second provided up to 13 weeks of additional payments to individuals who exhausted other programs that pay benefits, such as regular state unemployment benefits.
>
> In early December, roughly 14 million people were receiving benefits through those pandemic-relief programs, according to the Labor Department, representing nearly three-quarters of those currently receiving jobless benefits.
>
> The bill also extends the maximum number of weeks a person can claim unemployment benefits to 50 weeks. It provides an additional $100-a-week subsidy for workers who have both wage and self-employment income but whose basic unemployment benefits don't take into account their self-employment income.
>
> It also gives unemployed Americans a supplemental benefit of up to $300 a week, a cut from the previous $600 a week that was approved in April, and ended in the summer.
>
> The legislation extends until the end of January 2021 a federal eviction prohibition and provides $25 billion of assistance to tenants in arrears on their rent. It also contains billions of dollars to help airlines, small businesses, entertainment venues and farms, as well as money to help Americans get vaccinated from the virus.

Regarding the $7 billion broadband spending component of the COVID-relief package, conservative Free State Foundation had this summary:

> The relief package also includes $3.2 billion to keep Americans connected during the COVID-19 pandemic. Eligible households will receive a monthly emergency broadband benefit in the form of a $50 discount on high-speed Internet access service. Eligibility generally is limited to low-income households and those who have endured lay-offs or furloughs.
>
> [T]he FCC has sixty days to adopt rules implementing the program, which will continue for six months after the Secretary of Health and Human Services has declared an end to the public health emergency. The Commission will reimburse participating ISPs directly for the amount of the monthly discount and up to $100 for a connected device (tablet, laptop, or desktop computer) that they provide. A provider need not be designated as an Eligible Telecommunications Carrier in order to participate.
>
> In addition, the legislation tasks NTIA with disbursing a total of $1.3 billion for broadband grant programs, $1 billion targeting Tribal lands and $300 million for unserved (including rural) areas. Recipients of Tribal Broadband Connectivity Grants may use those funds to deploy fixed broadband infrastructure in unserved areas or, during the pandemic, for subsidized broadband service, distance learning, or telehealth programs.
>
> The remaining $300 million will be made available in the form of Broadband Infrastructure Deployment Grants, which will target unserved areas for network infrastructure construction and prioritize, among other things, projects that target smaller communities (that is, counties, cities, or towns with less than 50,000 inhabitants).
>
> NTIA also will become home to a new Office of Minority Broadband Initiatives that will perform a number of responsibilities, most significantly the administration of a $285 million pilot program focusing primarily on the broadband needs of Historically Black Colleges and Universities (HBCUs) and their surrounding communities.

National Telecommunications and Information Administration (NTIA)

NTIA has launched a Digital Inclusion webpage which provides a clearinghouse of information about federal and state digital inclusion resources. There is no NTIA webinar scheduled for December. The November webinar addressed How Broadband Enhances Local Economies while October addressed Digital Inclusion and K-12 Education: The Impact of COVID-19 on Students and Educators; archived webinars are here. The next webinar will be February 17, 2021: *Data as the Foundation for Broadband Planning* (registration link).

The December BroadbandUSA Newsletter links to a November 2020 PEW article providing an overview of states' efforts to tap CARES Act funding for broadband, with links to resources to track those efforts.[2] There are also links to broadband articles from Texas, Illinois, Mississippi, Wisconsin, Michigan (mapping northern Michigan's broadband desert), and Ohio (challenges bringing broadband to its southern Appalachian counties), among others.

NTIA hosts a searchable database featuring 50 federal broadband funding opportunities across a dozen federal agencies. The NTIA Broadband USA main page features a state-by-state summary of state broadband programs (scroll down to the map and click on a state).

USDA – Rural Utilities Service

The most recent RUS Community Connect Grant program application window is now closed. Grant awards require a 15% non-federal match and can range from $100,000 up to $3 million and can be used for the "construction, acquisition, or leasing of facilities, including spectrum, land or buildings used to deploy service at the [a minimum of 25 Mbps down/3 Mbps up] to all residential and business customers located within the Proposed Funded Service Area . . . ." Applicants must provide free broadband service for two years to "Essential Community Facilities" in the funded service area.

Proposed ReConnect projects can be viewed here (must create free log-in to access); 2019 awardees are identified here; 2020 awardees are here; proposed and funded projects are depicted on an interactive map here. The Distance Learning & Telemedicine Grant Program is currently closed.

Precision Agriculture

The FCC's Office of Economics and Analytics on December 15, 2020, released a working paper on the impact of broadband availability on agriculture:

> The working paper analyzes the impact of increased broadband availability in rural areas on the productivity of U.S. farms, drawing on both FCC data on broadband availability by census tract and U.S. Department of Agriculture data on agricultural productivity by county, for key row crops like corn, cotton, hay, and soybeans. The working paper finds statistically significant effects of increased broadband service, both in terms of lower costs (fertilizer, fuel, seed, etc.) and higher production (yield). To cite one striking result, the analysis finds that a 1% increase in the number of 25

[2] Somewhat related, U.S. DOE has launched a portal to track state usage of the $31 billion CARES Act Education Stabilization Fund.

> Mbps/3 Mbps or better broadband connections per 1,000 households is associated with a 3.6% increase in corn yields, as measured in bushels per acre.

The FCC's recently-approved $9 billion 5G Rural Fund will included a $1 billion set-aside for agricultural use in Phase 2. Farms are already using private LTE networks with CBRS spectrum, including greenhouse monitoring in Missouri and supporting drone-mounted cameras to make real-time decisions on herbicide applications in North Dakota. In the "miscellaneous" rural category, note the American Connection Project, which identifies existing open Wi-Fi networks in rural areas.

NTIA's September webinar on precision agriculture is available here. The most recent meeting of the FCC's Precision Agriculture Connectivity Advisory Task Force was October 28 and can be viewed here. Background and links to prior meetings are available here. The April 2019 USDA report on rural broadband infrastructure and next generation precision agriculture is available here. As the precision agriculture market explodes, Purdue University announced in August 2020 that it was collaborating with the National Science Foundation-funded Engineering Research Center to develop the Internet of Things for Precision Agriculture.

Federal Communications Commission

The Senate confirmed Republican nominee Nathan A. Simington to the FCC on December 8, 2020, replacing Commissioner O'Rielly. Although Simington was initially not favored to win confirmation, Senate Republicans apparently wanted to ensure that a Biden FCC begins deadlocked with a 2-2 tie (Carr, Simington, Rosenworcel, Starks). Assuming Rosenworcel becomes FCC Chair (as is expected), the Democrats in order to enjoy their majority will then have to clear a Democratic FCC nominee through the Senate without having the typical leverage of packaging the nomination together with a Republican nominee. (The politics of this are covered in more detail in this Politico article.)

The only broadband item from the December 10, 2020, FCC open meeting concerned adopting standards supporting broadcast Internet. The meeting also addressed several national security items concerning Chinese firms; the agenda and meeting details are available here. Although there are no specific items on the agenda for Chairman Pai's last open meeting on January 13, 2021, a number of items are "on circulation" for approval outside of the open meeting process, including a proposed NPRM on 12 GHz spectrum.

Spectrum

In this section of the monthly broadband policy update, we are maintaining short summaries of selected FCC spectrum proceedings that are active and which are expected to impact the public

availability of broadband. Because each of these items are often quite complex, we are focused on broad summaries and major developments only.[3]

National 5G Network?

This item will continue to generate tremendous political controversy which we will not be following in detail. However, here are some basics: In September 2020 the Department of Defense (DOD) issued a Request for Information (RFI) from industry concerning establishing a system to support widespread military and civilian spectrum sharing. The RFI is not limited to any particular spectrum band and, given military use of so much spectrum that is crucial for robust 5G, this is a potentially revolutionary development. Some see establishment of a governance body for all national 5G spectrum usage as a potential first step toward a controversial nationalized 5G system. Others see a potential opportunity to increase the availability and lower the cost of 5G services. Existing wireless carriers (of all sizes) inevitably see a threat to the value of their existing spectrum holdings and strongly oppose this move, while Google, Silicon Valley, and possibly defense contractor interests are pushing for it. One obvious hurdle is DOD's doubtful legal authority to commercially sub-lease spectrum allocated by NTIA without FCC approval.

Somewhat related, NTIA has launched an effort to develop more sophisticated spectrum sharing standards, called "Incumbent Informing Capability" (IIC) for 5G. "Although the effort appears to be in very early stages, it has far-reaching ramifications. It could release vast amounts of spectrum for 5G operators like Verizon and AT&T, but it could also create the possibility that US military commanders and others could cut into commercial 5G network capacity any time they want to."

L-Band (1.0GHz to 2.0GHz)

The FCC's unanimous decision in April to approve a long-pending request by Ligado Networks (f.k.a. LightSquared) to utilize a portion of the L-band spectrum continues to generate opposition. Because Ligado's spectrum is close to spectrum reserved for GPS, the Department of Defense

[3] Here is a short but helpful backgrounder on the importance of the different bands in the 5G era (courtesy Jeremy Horowitz at venturebeat.com):

> The . . . low band tier covers a lot of space, slowly, while the . . . mid band covers less space at faster speeds, and the . . . high band covers the least space at super-fast speeds. . . . One low band (600-700MHz) tower can cover hundreds of square miles with 5G service that ranges in speed from 30 to 250 megabits per second (Mbps). A mid band (2.5/3.5GHz) tower covers a several-mile radius with 5G that currently ranges from 100 to 900Mbps. Lastly, a high band (millimeter wave/24-39GHz) tower covers a one-mile or lower radius while delivering roughly 1-3Gbps speeds. Each of these tiers will improve in performance over time.

(DOD), Department of Transportation (DOT), and other interests strongly opposed this move. On May 22, NTIA (on behalf of DOD and DOT) formally challenged the FCC's decision through a petition for reconsideration and a petition for stay. While efforts to reverse the FCC's Ligado decision continue, most recently reflected by a letter to Congress on October 27 from nearly 80 organizations opposing the decision, Ligado has apparently raised $4 billion to implement 5G deployment in the cleared spectrum.

2.5 GHz Rural Tribal Priority Window (formerly EBS)

The FCC in 2019 decided to auction remaining unlicensed Educational Broadband Spectrum (EBS) (2.5 GHz band) to commercial users. This spectrum is suitable for mobile and fixed point-to-point wireless services. Prior to the auction, tribal entities in rural areas had a limited opportunity to apply for licenses for available 2.5 GHz spectrum in their areas through a "rural tribal priority window." With that window closed, the FCC is processing and accepting applications. (Once accepted, application are subject to further review and a public comment period before they are finally approved.) On October 23, 2020, the FCC announced the first batch of 154 2.5 GHz license grants to tribes.

The FCC on December 17, 2020 denied petitions for reconsideration of the July 2019 EBS Order – petitioners included SHLB.

3.1-3.55 GHz

On August 10, 2020, the White House announced an intergovernmental agreement where the Department of Defense has agreed to vacate a 100 MHz band from 3.45 to 3.55 GHz to allow for 5G use. This agreement clears the way for an auction of this valuable spectrum in as soon as 15 months. In September 2020 the Commission approved an order and notice of rulemaking proposing uses for the newly cleared 100 MHz of spectrum. The speed at which this agreement was reached is unusual by historical standards, where the process typically takes 5-8 years. The 3.1-3.55 GHz band is currently used by the Department of Defense (DOD) for fixed and mobile radar as well as secondary non-federal amateur and experimental users.

Citizens Broadband Radio Service (CBRS) (3.55-3.65 GHz)

The FCC's CBRS auction of Priority Access Licenses (PALs) closed on August 24, netting over $4.5 billion, with all three major wireless carriers bidding. Verizon, the large carrier with the biggest mid-spectrum needs, was the big winner, bidding $1.9 billion for 557 licenses in 157 counties. According to TeleCompetitor: "The top 5 CBRS auction winners combined will spend about $3.9 billion, representing nearly 87% of total auction proceeds. There were a total of 228 winners in the auction, including many small rural providers."

General Authorized Access (GAA) allow unlicensed access to available channels managed by a frequency coordinator called a Spectrum Access System (SAS). More information about SAS functionality – which is critical to all future spectrum sharing applications – is available here and here. A good general non-legal web resource for CBRS is available here.

UETN was in the news in October 2020, with their announced deployment of a private LTE network to 25 schools using GAA CBRS spectrum. UETN's project is expected to deliver robust parking lot access to school networks featuring high speeds and content filtering. Virginia Tech, which claimed eight PALs CBRS licenses, is expected to combine those with GAA use to develop innovative private LTE applications.

C-Band (3.7-4.2 GHz)

Broadcast satellite operations are the current licensed users of the mid-band C-Band spectrum. The FCC in February 2020 voted to approve two orders to reorganize and reclaim 280 MHz of the band for flexible-use and to facilitate public auctions of the newly available bands. Auction 107 commenced December 2020 and reached over $66 billion in proceeds after two weeks of bidding, setting a record. Complete auction results are available here.

4.9 GHz Band

From the Commission's background on this item:

> Nearly two decades ago, the Commission designated the 4.9 GHz (4940-4990 MHz) band for use in support of public safety. Today, the 4.9 GHz band remains underused outside of major metropolitan areas, with stakeholders citing high equipment costs and limited availability of broadband equipment, among several barriers to its use. Currently, access to the 4.9 GHz band is restricted to certain entities and use of the spectrum is limited to public safety purposes. Licensees do not receive exclusive use licenses for the spectrum but rather operate pursuant to a coordination framework for shared use of the band. Although nearly 90,000 public safety entities are eligible under our rules to obtain licenses in the band, there are only 3,559 licenses currently issued to 2,090 individual licensees.

The order, which was approved in September 2020, eliminated the exclusive public safety use requirement for the spectrum and permits "one statewide 4.9 GHz band licensee per state (the State Lessor) to lease some or all of its spectrum rights to third parties, including commercial, critical infrastructure, and other users, thus making up to 50 megahertz of mid-band spectrum available for more intensive use." Public safety interests are upset with the item and the speed at which it is proceeding, with a petition circulating to have the spectrum allocated instead to FirstNet.

5.9 GHz Band

The Commission at the November 2020 open meeting approved rules to reorganize spectrum previously reserved for the transportation sector ("Dedicated Short Range Communications" or DSRC) in order to support development of next generation "Cellular Vehicle to Everything" (C-V2X) technology in the upper band, while freeing up the lower 45 MHz of the 5850-5925 MHz band. The reorganization increases spectrum available for unlicensed Wi-Fi utilization – strongly supported by Qualcomm and silicon valley interests – but continues to be staunchly opposed on safety grounds by transportation interests including state departments of transportation for all 50 states.

6 GHz Band

In April 2020 the FCC authorized 1200 MHz of spectrum to be available for two kinds of unlicensed use of the 6 GHz band: low power indoor usage and standard power usage anywhere. By expanding Wi-Fi and increasing opportunities for innovation, the FCC's action is widely expected to create billions in value for the economy. Some claim this is the most important decision the FCC has made on unlicensed spectrum use in 25 years. On October 2, the DC Circuit denied emergency requests to stop the 6 GHz order from taking effect – however those cases will continue to be heard. Interests opposed to the FCC's 6 GHz order included AT&T, the National Association of Broadcasters (NAB), and public safety groups. Generally, opposing interests fear interference with incumbent operators with AT&T, for example, expressing concern that existing microwave links used for network backhaul will be disrupted.

12 GHz (coming soon, but here is a preview).

White Spaces

The unused spectrum between TV station channels or in places where channels are vacant are called "white spaces." This vacant broadcast spectrum represents a resource for mobile broadband, particularly in rural areas. In March 2020 the FCC proposed updated rules to facilitate increased innovation in the white spaces area. The FCC approved proposed rules in October 2020 that are expected to protect broadcasters while allowing innovative 5G and broadband deployment in the unused channels. These rules were essentially the product of a negotiated industry consensus between broadcasters and groups such as Microsoft who have helped perfect the technology necessary to make spectrum sharing in these spaces work.

Low-Earth Orbit (LEO) Satellite

Elon Musk's SpaceX in October 2020 launched its "Better Than Nothing Beta" test of its Starlink LEO satellite internet service. The beta has a $499 set up fee associated with the equipment needed to connect, and a $99 monthly fee. A Starlink spokesperson explained: "Expect to see data speeds vary from 50Mb/s to 150Mb/s and latency from 20ms to 40ms over the next several months as we enhance the Starlink system. There will also be brief periods of no connectivity at all." Amazon is also launching a massive LEO project, called "Kuiper." Notwithstanding these well-funded, glitzy LEO start-ups, skeptics remain.

Starlink ended up being a big winner in the just concluded Rural Digital Opportunity Fund (RDOF) reverse auction, winning $885.5 million of the $9.2 billion available. (AT&T has a useful overview of the complete RDOF auction results that, of course, also provides the big ISP perspective. A more skeptical perspective on the RDOF results can be found here.)

Universal Service/Digital Equity

The current universal service construct, which is over 25 years old, is straining to address the equitable distribution of limited broadband resources – partly reflected in a universal service fund contribution factor just jumped in one quarter from 27% to almost 32%. The next FCC will inherit this unstable situation and so we are adding this general universal service section to the memo. Notably, the related concepts of universal service and digital equity seem to merging, as illustrated by this recent comprehensive Benton report: "Broadband for America NOW".

COVID-19: New Telehealth Programs and E-rate & Rural Health Waivers

The $100 million Connected Care Pilot Project application window opened in early November and closed December 7. The linked public notice above has essential information, but here is the FCC's Connected Care Pilot webpage with more background.

The Commission's March 2020 COVID-related waiver the gift rules for both the E-rate and RHC programs was recently further extended until June 30, 2021. Note the waiver is available only to certain entities:

1. Health care providers "involved in the screening and treatment of patients for COVID-19 and in providing service to other patients in an effort to both help mitigate the spread of COVID-19 and devote limited on-site medical resources towards treatment of COVID-19";

2. "E-Rate eligible entities on behalf of students, teachers, or patrons while schools and libraries prepare for extended remote learning and remain fully or partially closed as a direct result of COVID-19."

The FCC in April 2020 established the COVID-19 Telehealth Program in response to Congress appropriating $200 million in funding for telehealth to the FCC as part of the CARES Act. *(As noted above, Congress has appropriated an additional $250 million to this program, which we will look at more closely next month*.) Funding was exhausted by June 2020 and the final list of awardees is available here (Excel; PDF). Successful applicants received funding commitments that they could claim by demonstrating the purchase of eligible goods or services by September 30, 2020. The FCC in September 2020 extended that purchase deadline until December 31, 2020.

E-rate

The Commission on December 10, 2020, modified E-rate invoicing rules to ensure applicants have the ability to invoice for 120 days after USAC issues a revised funding Commitment.

New America recently released a report addressing the digital learning gap in the age of COVID: The Online Learning Equity Gap – Innovative Solutions to Connect All Students at Home. The report strongly supports the FCC's use of E-rate funding to support digital learning outside of the classroom, and highlights innovative efforts in Colorado and Virginia to address the "online learning chasm." Related: see this article about the DragonNet project in Missouri. As noted, last month, Funds for Learning has released its annual E-rate Trends Report for 2020, reflecting spending and survey data through July 17, 2020.

Rural Health Care

We understand the FCC has instructed USAC to clear the backlog of unapproved Rural Health Care (RHC) applications from FY 2019 and to release applications that have been unofficially held from prior years, assumed to be based on disputes over the appropriate "rural rate." This push to clear the backlog is coming at the expense of resources devoted to new funding applications for FY 2021. Paradoxically this means, although the new rules allowed competitive bidding to start this past July 1 (instead of the upcoming January 1), many may not be able to commence their applications early because of USAC delays approving eligibility and RFPs.

Net Neutrality

No parties sought Supreme Court review of the October 2019 DC Circuit decision upholding the FCC's 2017 repeal of net neutrality rules, thus ending the voluntary stays in the state-specific federal litigation. Recall the DC Circuit reversed the FCC in asserting blanket preemption of state-specific rules, but this did not preclude state-by-state preemption claims based on specific conflicts with federal law. In addition to California and Vermont (litigation updates below), four other states have enacted some form of net neutrality law: Colorado, Maine, Oregon, and Washington, none of which have yet been challenged by industry or the federal government.

The likely reason for no new cases is that potential litigants are looking to the California and Vermont cases to see what those courts do. Meanwhile, Public Knowledge highlights some of what carriers are up to in the absence of federal net neutrality rules.

Federal Courts:

- Eastern District of California. In October 2018, SB 822, the California Internet Consumer Protection and Net Neutrality Act of 2018 was challenged in federal district court in California by the DOJ and several industry groups in a separate suit. DOJ had sought a preliminary injunction but the court agreed to a request by all parties to stay the case after California agreed not to enforce the law pending final resolution of *Mozilla v. FCC*. The DOJ on August 5, 2020 filed a renewed motion for a preliminary injunction; the state responded on September 16; reply briefs by the DOJ and industry groups were filed October 14.

- Vermont District Court. In October 2018 the same industry groups – American Cable Association (ACA), CTIA - The Wireless Association (CTIA), NCTA - The Internet & Television Association (NCTA), and USTelecom challenged Vermont's net neutrality law and executive order in federal district court there and in January 2019 sought summary judgment. The parties in March 2019 agreed to stay further proceedings pending a final resolution of *Mozilla v. FCC.* DOJ and industry groups also renewed their challenges to the Vermont law after the stay expired, however the parties have agreed to a new stay pending the outcome of the motions for injunctions in the California litigation.

States

The National Conference of State Legislators (NCSL) features a summary of net neutrality efforts by state for 2020 here (updated March 27, 2020). *Note this list does not identify current laws, only current efforts to pass new laws*.