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Composition II

2 February 2024

The State of Rural Internet

Internet service has paved the way for education, job opportunities, and health care. Arkansas has made great efforts to connect communities; however, it falls short in rural communities. According to a 2022 report compiled by the Broadband Development Group, 210,000 Arkansas households are still faced with inadequate broadband access (5). The Federal Communications Commission refers to broadband internet access as download speeds of at least twenty-five megabits per second and three megabits per second upload speeds (Brodian). In light of the COVID pandemic and "increasing uses and demands for broadband" the FCC has inquired about increasing the benchmark for internet speed to one hundred megabits per second for downloads and twenty megabits per second for uploads (Brodian). The FCC's goal is to push internet service providers to extend internet access to low-income and rural neighborhoods which are often left behind (Dobis and Thomas). Internet access has become a utility for Arkansans, but many ranchers are currently unserved or underserved; solutions such as federal grants, low-cost wireless, and low-orbit satellite internet can set a pathway for greater productivity in Arkansas.

In much of the world, the internet has allowed for a new wave of education access. This includes virtual schooling platforms and online tutoring. However, the U.S. Committee on Oversight and Accountability wrote that the lack of internet access hinders a student's ability to participate in online schooling, educational resources, and "further [hinders] access to economic opportunity" (Cloud). Arkansas ranchers also have a use for the internet. Modern farming

techniques include abilities to maximize yield production, however, these techniques require data collection and analysis performed in data centers–all of which require an internet connection. Yet, twenty percent of Arkansas farms lack internet access (Seo 1). Ultimately, these faults in internet access lead to economic implications which only further inhibits economic growth in rural communities. This is where federal grants can come in and bridge the gaps that falter economic growth. In June of 2023, the Biden-Harris Administration announced one billion dollars to Arkansas to build out internet infrastructure, training, and workforce development efforts ("Biden-Harris Administration Announces $1 Billion to Arkansas"). Upon the announcement, Arkansas' Commerce Secretary reiterated that "high speed internet is not a luxury, but [a] necessity" ("Arkansas to Receive $1 Billion for Broadband Expansion."). The secretary also announced that funding will be used to improve digital skills in the workforce ("Arkansas to Receive $1 Billion for Broadband Expansion."). Arkansas was one of many states to receive funding from the federal Commerce Department's $42.5 billion ("Biden-Harris Administration Announces $1 Billion to Arkansas").

Low-cost wireless includes telecommunications equipment from telecoms such as Verizon and AT&T. Wireless also includes point-to-point terminals that are wireless connected between two or more homes or businesses through the use of antennas. Mexico, a country with less than seventy percent of the population connected to the internet, deals with the very same issue Arkansas has: ruralness (Martinez-Dominguez 1). In 2021, during a visit to Santiago Yucuyachi, a rural town in the southern Mixtec region of Mexico, there was an opportunity to create an internet service provider using these point-to-point antennas. With the help of the municipality authorities, Starlink–a satellite internet device, and Ubiquiti equipment, a plan was developed to launch broadband internet service to the town. During trial runs in the past year, the

plan proved to work. Using point-to-point antennas and a centralized base station, the town was able to receive three hundred megabits per second at symmetric download and upload speeds, surpassing the FCC's minimum broadband speed (Brodian). Therefore, if the rural areas in Arkansas adopt a similar strategy, ranchers, or Wireless Internet Service Providers (WISPs), could potentially receive a fiber-like connection over tens of miles (Cameron 105). The benefit that this kind of internet connection provides is that there is no need for the direct connection of fiber lines. Instead, it would be done through a wireless connection that can be spread out over miles, ultimately reducing infrastructure costs. Currently, there is no widespread adoption of wireless internet service providers, however, WISPs in New Zealand have users pay around seventy dollars per month (Cameron 123). Although the cost levied on the end user is higher than the average monthly internet bill of fifty-three dollars in Arkansas, when it is compared to what a fiber line cost would be, it is a substantial discount (Arkansas Development Finance Authority 6).

Internet technologies have grown rapidly within the last decade. Satellite internet, once a frustrating technology, is now user-friendly and oftentimes exceeds the FCC's minimum broadband requirements (Brodian). Low-orbit satellites from SpaceX's Starlink, O3b, and OneWeb have increased speeds tenfold over competitors such as HughesNet using high Earth orbit geosynchronous satellites (Parks 4). These internet startups–with roots in Silicon Valley–also have partnerships with the satellite sector, such as Airbus and Intelsat (Parks 7). In 2017, Starlink's Vice President Patricia Cooper claimed "SpaceX plans to bring high-speed, reliable, and affordable broadband service to consumers in the U.S. [...] including areas underserved or currently unserved by existing networks" (United States Committee on Commerce, Science, and Transportation 5). Due to the number of satellites launched and

continuing to launch, Starlink can connect to the internet almost anywhere in the world, but concern for congestion in the Earth's orbital plane and questions for orbital regulation arise (Parks 12). Starlink and other low-orbit satellites need many orbital satellites to reduce latency between the user's terminal and the satellite, but also to reduce congestion with all the other terminals on Earth (Parks 5). To do this, Starlink continues to launch satellites but also uses software to allocate broadband resources (United States Committee on Commerce, Science, and Transportation 5). In December of 2023, after multiple attempts from Elon Musk to use the Rural Digital Opportunity Fund to subsidize Starlink's service, the FCC reaffirmed its decision to reject $900 million of subsidy ("FCC Reaffirms Rejection of Nearly $900 Million Subsidy"). The FCC marks its decision on Starlink "[failing] to meet basic program requirements" ("FCC Reaffirms Rejection of Nearly $900 Million Subsidy"). Without a subsidy, the price of Starlink is steep, yet still in reach of most consumers left without any other options. According to Starlink's website with an Arkansas address, equipment is six hundred dollars with a monthly service of $120 ("Starlink for Homes").

Internet communication has become a transformative power and is becoming ever more indispensable. At the same time, the issue of limited internet access in rural Arkansas has persisted and continues to be a pressing issue that hinders socioeconomic development. Fixes for rural internet should involve the federal government and grants announced in recent months have provided a substantial amount of aid for Arkansas governments. In addition, a wave of wireless internet service providers can emerge to connect rural communities while maintaining a low cost for the users. Low-orbit satellite connections have also demonstrated faster speeds than the FCC's minimum broadband definition while maintaining lower costs than establishing fiber

infrastructure (Cameron 105). Finding a remedy for rural internet infrastructure is critical in ensuring equitable access to opportunities and resources.

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