



Office of Inspector General | United States Postal Service

RISC Report

Next Generation Connectivity: Postal Service Roles in 5G and Broadband Deployment

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The background of the lower half of the page is a composite image. On the left, a tall telecommunications tower with multiple antennas is visible against a dark sky. On the right, a white postal delivery truck is shown from a low angle. The central focus is a glowing, blue and purple network visualization consisting of numerous interconnected nodes and lines, resembling a mesh or fiber-optic network. The large, white, bold text "5G" is superimposed over this network visualization.

5G

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Executive Summary

5G, or fifth generation cellular wireless, is the next stage of development in wireless connectivity. It will not only improve the speed and reliability of connectivity on our cell phones, but it could facilitate a new landscape of wirelessly connected devices, from smart city infrastructure, to autonomous vehicles, to increasingly connected manufacturing and agricultural technology. This improved connectivity could translate into significant economic and societal benefits. At the same time, a digital divide persists — at least 18 million people in America do not have access to broadband and a larger number are not subscribed.

The U.S. Postal Service Office of Inspector General (OIG) conducted research to determine whether there are roles the Postal Service can play to support 5G and broadband deployment, particularly to unserved and underserved areas. The OIG concluded that there may be an opportunity to leverage the Postal Service's network of over 31,000 facilities nationwide.

5G will require a wide distribution of antennas, fiber optic cable, and other communications infrastructure. As such, there may be opportunities for the Postal Service to work with industry partners in identifying facilities where antennas could be located and sites that could be utilized for fiber optic cable connection points. In fact, the Postal Service already leases space for communications infrastructure at 62 of its facilities, and there may be opportunities to expand this program as demand for 5G grows. Federal funding for 5G and broadband deployment could make new sites economically feasible for colocation, including facilities in or near underserved rural and Tribal areas. While we identify some challenges in the paper, these efforts align with broader initiatives to leverage federal infrastructure to support broadband deployment.

Similarly, the Postal Service could work with partners to explore leasing indoor space for edge computing, bringing cloud computing resources closer to end users to speed up data transmission and processing. Locating computing power closer to consumers may be essential for realizing the full benefits of widespread 5G. Not all postal facilities will be able to host servers, but some post offices and

Highlights

5G is the next generation of wireless broadband, and while it is still in the early stages of deployment, it offers long-term potential to help foster the wireless Internet of Things.

USPS should explore ways to leverage its large physical footprint to facilitate 5G and broadband deployment. Partnerships could identify viable sites for antenna and fiber optics infrastructure colocation, as well as indoor space for edge computing.

USPS can help bring broadband connectivity to unserved and underserved rural areas and explore partnerships to foster broadband-enabled services and access to broadband-related government programs.

USPS can potentially partner to assist in collecting data on the availability of wireless broadband service and can make data on viable USPS facilities available to potential industry partners.

some of the over 280 mail processing facilities may offer viable colocations with edge computing providers.¹

Another opportunity for the Postal Service is to promote access to broadband-enabled services. Opportunities include identifying communities where postal facilities can be a digital hub for Wi-Fi access, supporting public safety communications networks, and helping promote broadband-related government services. While these efforts would not generate significant revenue and would require partnerships, they would make USPS's abundant infrastructure even more valuable to the nation and its citizens, consistent with the Postal Service's public service mission.

¹ For more on mail processing facilities, see "Facility Condition Reviews—Mail Processing Facilities" USPS OIG, Report Number SM-AR-19-003, May 6, 2019, <https://www.uspsoig.gov/sites/default/files/document-library-files/2019/SM-AR-19-003.pdf>.

Lastly, the Postal Service can contribute to national broadband deployment efforts by assisting in collecting data on wireless broadband service. Data on nationwide connectivity are an important component of federal efforts; specifically, influencing the distribution of federal funds. Likewise, to effectively leverage federal facilities for broadband deployment, service providers need platforms to learn what assets are available for a particular project. USPS would be able to play a role on both these fronts by harnessing its assets to facilitate data collection efforts and by making facilities data available to potential partners. In fact, the Broadband Deployment Accuracy and Technological Availability (DATA) Act, which became law in March 2020, requires the Federal Communications Commission to test

the feasibility of working with USPS for data collection. USPS could potentially leverage its delivery network that reaches nearly every neighborhood to support wireless broadband data collection, which in turn would better inform policymakers' decisions.

As policymakers turn their attention to funding and promoting the deployment of 5G and broadband infrastructure, they can consider ways to cost-effectively leverage the Postal Service's nationwide network. The Postal Service can also continue to evaluate what partnerships align with its strategies. By playing a broader role in 5G and broadband deployment, the Postal Service would further its foundational mission to bind the nation together.²

² USPS Mission Statement, adopted April 1, 2020, <https://about.usps.com/who/profile/>.

Introduction

The Internet is among the most transformative technological advancements in history. It has dramatically changed the way we work, shop, learn, and interact. Remarkable advancements in wireless connectivity over recent decades have given us access to the Internet nearly anywhere. 5G, the next generation in wireless connectivity, will do much more than improve the speed and reliability of connections on our cell phones. It could help foster a new landscape of wirelessly connected devices, from smart city infrastructure, to autonomous vehicles, to increasingly connected manufacturing and agricultural technology.

At the same time, there remains a digital divide — some Americans have access to high-speed, state-of-the-art broadband service, while others do not. Lack of broadband deployment is most pronounced in rural and Tribal areas. The economic and societal benefits that high-speed broadband offers are not currently available to all.

“Today, a myriad of everyday activities, such as video streaming, real-time face-to-face interaction, and telehealth consultations require substantial and reliable bandwidth.”

There are opportunities for the Postal Service to leverage its network — which is the largest physical and logistical infrastructure of any non-military U.S. government institution — to help support 5G deployment, including to unserved and underserved areas. This paper first examines these opportunities by providing a high-level overview of the current state of 5G and broadband technology and deployment. Then, we explore opportunities for the Postal Service to: (1) support 5G deployment, (2) help bring 5G and other broadband connectivity to

underserved regions and populations, and (3) improve broadband data collection and data availability.

Objectives, Scope and Methodology

The U.S. Postal Service Office of Inspector General’s (OIG) objective was to determine whether there is a role for the Postal Service to play in helping deploy 5G and broadband service, including to underserved/unserved areas in the U.S. The project focused on answering three questions:

1. Where in the nation is 5G and broadband service lacking, and what are the reasons behind it?
2. What role(s), if any, can the Postal Service play in helping to facilitate 5G and broadband deployment, including to unserved/underserved areas?
3. Are there other opportunities for the Postal Service to expand access to services supported by high-speed broadband nationwide?

To research these questions, the OIG reviewed publicly available research and conducted spatial analysis, contracted with a broadband subject matter expert consultancy, and interviewed subject matter experts and federal agency representatives.³ See [Appendix A](#) for more details on the methodology.

Defining Broadband and 5G

Broadband is a catch-all term that is widely used, yet often misunderstood. In simplest terms, broadband is high-speed Internet access. The Federal Communication Commission’s (FCC) definition of what constitutes broadband — currently 25 megabits per second (Mbps) downstream and 3 Mbps upstream — has evolved over time, as technology, applications, and consumer demands have advanced.⁴ Today, a myriad of everyday activities, such as video streaming, real-time face-to-face interaction, and telehealth consultations require substantial and reliable bandwidth.

³ The OIG explored a role for the Postal Service in broadband deployment in two prior reports: “A Possible Pilot Collaboration between Rural Telecom Providers and the Postal Service,” USPS OIG, Report No. RARC-IB-13-001, February 8, 2013, https://www.uspsig.gov/sites/default/files/document-library-files/2015/rarc-ib-13-001_0.pdf; and, “21st Century Post Office: Aligning with the National Broadband Infrastructure Initiative,” USPS OIG, Report No. DA-MA-12-002, January 23, 2012, <https://www.uspsig.gov/sites/default/files/document-library-files/2015/DA-MA-12-002.pdf>.

⁴ “Downstream” speeds refer to the speed with which data travels from the Internet to the user’s computer; “upstream” speeds refer to how quickly data travels from the user to the Internet.

Broadband Service May Be Deployed Using A Variety of Technologies

Consumers receive broadband service via a wide array of technologies, differing in costs, deployment challenges, and capabilities.

- **Digital subscriber line (DSL):** DSL allows for the transmission of data over existing copper telephone lines. While deploying DSL service is relatively inexpensive, available speeds cannot approach those of newer technologies.⁵
- **Coaxial DOCSIS systems (cable):** These systems carry data over the same coaxial cable used to bring cable television service to households.⁶
- **Fiber optic cable (fiber):** Fiber is state-of-the-art for wireline broadband provision. Comprised of numerous strands of glass fiber each the thickness of a human hair, fiber optic cable holds advantages in terms of speed and capacity over every other currently available technology. It is frequently described as “future proof” as it has capacity to support applications that are not yet commercially available. Deploying fiber can be a relatively expensive proposition and deployment in harsh terrain can be especially difficult. Despite these challenges, fiber deployment continues at a steady clip, especially in cities, as carriers recognize its significant value to their networks and customers.
- **Fixed and mobile wireless broadband:** Wireless broadband can be fixed (sent to a specific physical location) or mobile (sent to a wireless handset that may move from place to place). It may be deployed utilizing either licensed or unlicensed spectrum (the range of radio frequencies used to provide service).
- **Satellite broadband:** Satellite broadband service bounces wireless signals off any of the numerous fixed orbit geosynchronous satellites above the Earth.⁷ It

is a shared service, so quality degrades as more consumers access it. It can be expensive, and there are often issues of latency (the delay between data transmission and reception).⁸

While the technologies above are distinct, many are interconnected, differing in how broadband service is delivered to end user consumers. For instance, while antennas deliver broadband to your cell phone wirelessly, the mobile network is reliant on an underlying wireline infrastructure connecting towers, including fiber.

5G is the Next Generation of Wireless Connectivity

Each successive generation of wireless technology offers capabilities surpassing those of previous generations, and fifth-generation, or “5G” wireless broadband holds the potential to go far beyond other wireless broadband technologies in terms of speed, reliability, and capacity. While many consumers are familiar with the term 5G because of its widespread use in marketing materials, deployment is still relatively sparse, limited to select parts of large metropolitan areas. In many areas, particularly those where fiber deployment is lacking, true 5G-level service will not be available for quite some time.⁹

Table 1 shows the evolution of wireless service up to the present day, as well as the services enabled by each generation.

“While antennas deliver broadband to your cell phone wirelessly, the mobile network is reliant on an underlying wireline infrastructure connecting towers.”

5 DSL allows voice and data to share the copper line, enabling users to access broadband and wireline telephone simultaneously. However, copper is considered an outdated technology and many providers are hesitant to invest in copper infrastructure.

6 While cable speeds can be quite high, it is a shared technology, meaning that speed is inversely proportional to the number of users online at any given time. Further, cable infrastructure requires ongoing maintenance and upgrading.

7 A geosynchronous orbit is a high-Earth orbit that matches the Earth’s rotation, thus allowing satellites to appear to remain in a fixed position in the sky.

8 Satellite is generally considered a last option for those consumers who cannot access broadband via any other means.

9 The term “true” as used here refers to actual 5G service. Recently, providers have agreed to stop advertising so-called “5G Evolution” service, which is in reality upgraded 4G LTE service. Critics have claimed that such advertising misleads consumers. See, for example, Fierce Wireless, “AT&T to Stop Using ‘5G Evolution’ in Ads After Unsuccessful Appeal”, May 21, 2020, <https://www.fiercewireless.com/operators/at-t-to-stop-using-5g-evolution-ads-after-unsuccessful-appeal>.

Table 1. The Evolution of Wireless Service

Generation	Year Introduced	Features	Top Speed ¹⁰
1G	1979	Voice calls	2.4 kbps
2G	1991	Call and text encryption Text and picture messages	50 kbps
3G	1998	Data transmission Video calling Mobile Internet	2 Mbps fixed/ 384 kbps mobile
4G	2008	HD mobile TV Video conferencing	1 Gbps fixed/ 100 Mbps mobile
5G	2020	Faster data transmission High connection density Increased capacity Lower latency ¹¹	Up to 20 Gbps

Source: Lifewire, "1G, 2G, 3G, 4G and 5G Explained," June 17, 2020, <https://www.lifewire.com/1g-vs-2g-vs-3g-vs-4g-vs-5g-578681>.

Some consumers may not initially notice much of a difference once they are able to access 5G — they will be able to do everything they could with 4G LTE, only faster and with lower latency.¹² 5G speeds can be as much as twenty times faster

than 4G speeds. In the longer term, 5G could bring significant societal change by vastly increasing the capacity for other devices to harness wireless broadband and fostering a much broader "Internet of Things" (IoT) — the networking of machinery and devices through the Internet. While it is impossible to predict exactly what this change could look like, it could cut across the economy, from health care monitoring and public safety applications, to widespread self-driving vehicles, and smart infrastructure, agriculture, and manufacturing.

Like most new technologies, however, 5G faces its own set of challenges:

- **Limited range for high frequency millimeter waves (mmWave).** mmWave technology enables the fastest 5G coverage available but has distance and line of sight limitations. Limited range makes deployment of mmWave less practical in rural areas where the distance between customers is greater.
- **5G will require much more fiber infrastructure.** Obtaining true and widespread 5G speeds will require many more fiber interconnections. While more and more fiber is being deployed every day, there are still many parts of the country — particularly in rural areas — where fiber is not yet available.
- **5G-capable devices are not yet widely available.** Consumers can only access 5G using a 5G-capable handset. Every single consumer will eventually need to swap out their current 4G handset for a 5G-capable device — an expensive proposition that will also slow adoption in disadvantaged communities.

The challenges mean widespread 5G deployment will require massive investment in new infrastructure over the coming years.

¹⁰ "Kbps" is kilobits per second; "Mbps" is megabits per second; "Gbps" is gigabits per second.

¹¹ "Latency" refers to the lag between the transmission of data and its receipt. High latency creates serious issues for real-time conversation and other sensitive applications, such as autonomous vehicles.

¹² LTE stands for "long term evolution." 4G LTE is an enhanced level of 4G service.

Figure 1: 5G Spectrum

5G Harnesses Three Spectrum Bands

5G service utilizes three spectrum bands, or groups of radio frequencies:

- High frequency millimeter wave spectrum has very high capacity but is very limited in distance traveled, covering only a few hundred feet, or a city block;
- Low band spectrum travels much farther but has substantially lower capacity; and
- Mid band spectrum falls somewhere between the two.

The Enduring Digital Divide

Despite progress in broadband deployment in the last few decades, a digital divide still exists in the U.S. An enduring digital divide has implications for the economic, educational, social, and health status of those lacking broadband connectivity. The COVID-19 pandemic has served to underscore the importance of broadband for enabling telehealth, telework, and distance learning.

According to the FCC, more than 18 million Americans, or 5.6 percent of the population, currently lack broadband service and thus are effectively shut out of the benefits broadband has to offer.¹³ Most of the unserved population is clustered in rural areas, where 22.3 percent of the population lacks broadband service, and Tribal lands, where 27.7 percent are unserved.¹⁴ Typically, these areas are the most difficult and expensive to serve. Population density is lower in rural areas, meaning that there are fewer potential subscribers to cover deployment and

operational costs. Geography can also make rural deployment challenging, with more mountains, trees, rocky soil and deep winter freezes. In addition to these deployment challenges, 35 percent of those who have access to broadband service are not subscribing.¹⁵ Thus, many Americans still cannot achieve the myriad benefits of high speed Internet service, and this digital divide — resulting from a lack of access or adoption — represents significant lost opportunities for the nation as a whole.

Figure 2: Broadband Deployment and Adoption

A Note on Deployment vs. Adoption

Even if broadband service has been deployed to an area, its benefits cannot be fully realized unless consumers subscribe to the service. There are several socioeconomic factors which impact broadband adoption decisions, including:

- **Lack of Demand:** Consumers may not identify a need for broadband in their lives;
- **Lack of Resources:** Consumers may not be able to afford the costs inherent to broadband adoption, namely the cost of hardware, such as a PC or wireless handset (one time) and the broadband subscription itself (ongoing); and
- **Lack of Knowledge or Experience:** Consumers may not know how to access the Internet and may not know where to go to ask for help.

Broadband access and adoption are both vital. While this paper focuses on issues surrounding broadband deployment, adoption issues ultimately are no less important for achieving the goal of bringing the benefits of the Internet to all Americans.

¹³ The percentages for deployment and adoption in this paragraph are for 2018 and refer to fixed terrestrial service at 25 Mbps downstream/3 Mbps upstream. Federal Communications Commission, “2020 Broadband Deployment Report,” FCC 20-50, GN Docket No. 19-285, April 24, 2020, p. 19. <https://docs.fcc.gov/public/attachments/FCC-20-50A1.pdf>.

¹⁴ *Ibid*, p. 18

¹⁵ *Ibid*, p. 31.

Federal efforts help promote deployment

As the benefits of broadband Internet service and the costs of the digital divide become increasingly evident, the federal government has taken steps toward promoting widespread 5G deployment. For example, the FCC has proposed distributing \$9 billion through its Universal Service Fund for 5G wireless

“The more than 31,000 postal facilities in communities large and small put the postal network in close proximity to a large swath of the American public.”

broadband connectivity in rural America.¹⁶ Additionally, the FCC recently conditioned its approval of the merger between wireless carriers T-Mobile and Sprint on the newly-formed carrier deploying 5G service to 85 percent of rural Americans within three years and 90 percent of rural Americans within six years, as well as requiring other 5G coverage commitments from DISH Network.¹⁷ Earlier in 2020, an infrastructure bill introduced in the House of Representatives proposed providing \$100 billion for broadband deployment in unserved and underserved areas.¹⁸

These steps represent important commitments to bring 5G to rural areas.

Partly as a result, some areas could leapfrog from lower quality service directly to 5G, bypassing the intermediate levels of wireless broadband service. The Postal Service can play several potential roles in helping facilitate widespread 5G deployment.

Opportunities for the Postal Service to Support 5G Deployment

The Postal Service could directly support 5G deployment by leveraging its physical infrastructure for the collocation of towers, antennas, and other communications equipment. These opportunities would not require the Postal Service to start from scratch; rather, it could build on existing arrangements whereby space is leased for telecommunications infrastructure. This would align with broader initiatives to leverage federal assets for 5G and broadband deployment. This section outlines some ways the Postal Service could support 5G deployment and potential partnership opportunities.

Leveraging Postal Service Assets to Deploy 5G Infrastructure

The Postal Service could leverage its assets for 5G deployment through:

- 5G antenna collocations and deployment of fiber on postal facilities,
- Leasing space inside postal facilities for servers and edge computing.

5G antenna collocations and deployment of fiber on postal facilities

Achieving 5G's extremely bandwidth-intensive benefits will require many more antennas densely distributed throughout cities compared to prior generations of wireless technology. The U.S. could require as many as 800,000 5G “small cell” antennas, as compared to the 200,000 existing cell towers.¹⁹ The more than 31,000 postal facilities in communities large and small put the postal network in close proximity to a large swath of the American public.²⁰ An estimated 44 million people live within one mile of a postal-owned (not leased) facility. (See [Figure 3](#)).

¹⁶ “FCC Proposes the 5G Fund for Rural America,” FCC, April 23, 2020, <https://docs.fcc.gov/public/attachments/DOC-363946A1.pdf>.

¹⁷ “FCC Approves Merger of T-Mobile and Sprint,” FCC, November 5, 2019, <https://docs.fcc.gov/public/attachments/DOC-360637A1.pdf>.

¹⁸ H.R. 2, “The Moving Forward Act,” Sec. 1603, June 11, 2020, <https://www.congress.gov/116/bills/hr2/BILLS-116hr2eh.pdf>.

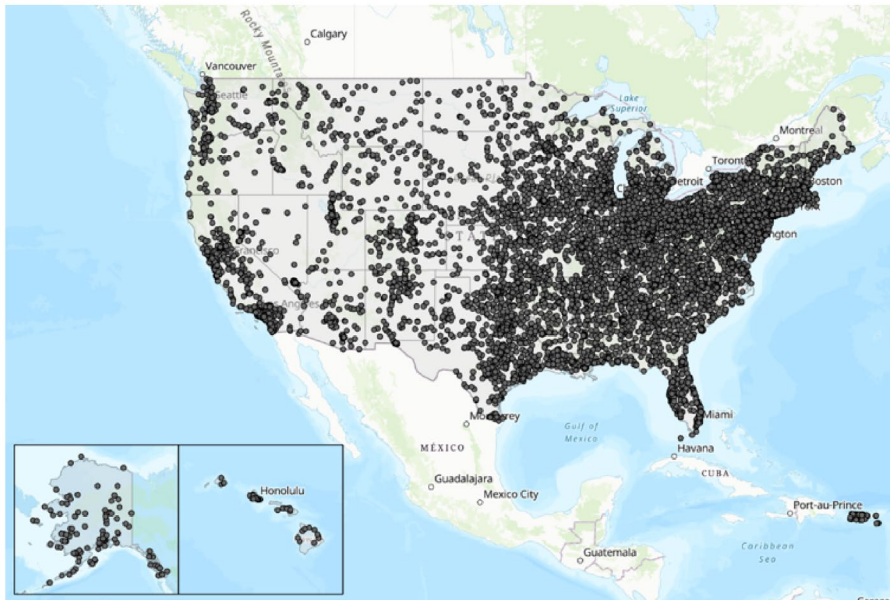
¹⁹ “Why 5G Can't Succeed Without a Small Cell Revolution,” PWC, 2018, <https://gsma.force.com/mwcoem/servlet/servlet.FileDownload?file=00P1r000025E2yhEAC>.

²⁰ The OIG has previously discussed this concept in two white papers previously mentioned in footnote 3.

Figure 3: The Postal Service's Facility Footprint

THE POSTAL SERVICE OWNS (NOT LEASES) MORE THAN 8,000 FACILITIES NATIONWIDE

Forty-four million people live within one mile of the more than 8,000 facilities that are directly owned (not leased) by the Postal Service. Mapped below are facilities owned by the Postal Service.



Source: OIG analysis of Postal Service and U.S. Census Bureau data.

Tower infrastructure companies and cellular carriers are potential lessors that could leverage postal facilities for 5G deployment. In fact, the Postal Service already has existing agreements with tower companies to lease space for wireless towers at 62 postal facilities, which accounts for \$1.4 million in annual revenue. There may be opportunities to expand these agreements to support rising demand for 5G antenna deployment.

Partners could utilize postal facilities for 5G deployment in a few different capacities.

- **Small cells.** 5G small cells could be mounted on viable existing buildings or placed on poles less than 50 feet in height. Small cells are low-power frequency base stations that provide 5G coverage and capacity. They are necessary to achieve the fastest wireless speeds in the 5G network. As the name implies, small cells are smaller than traditional communications equipment. As a result, they could be placed on postal facility rooftops, and do not require large free-standing towers. However, small cell coverage is limited to a few hundred feet or a city block, and thus, they would be most practical at postal facilities in densely populated areas. Figure 4 demonstrates communications infrastructure mounted on rooftops, including small cells.

Figure 4: Roof-Mounted Communications Infrastructure



Source: Getty Images.

- **Vertical structures.** As cellular carriers develop their 5G networks and the technology becomes more economically feasible, providers could use postal facilities that are suited for siting larger vertical structures or towers to host antennas. Larger towers will still be required for 5G outside of densely populated areas, and in areas where obstructions, such as trees or hills, require a vertical advantage. Whether the tower is on the ground outside the facility or on a rooftop, postal facilities with adequate space could be used for the deployment of 5G into more suburban and rural areas.

- **Fiber optic cable connection points.** The Postal Service could also lease outdoor ground space to infrastructure companies to house connection points for fiber optic cable, also known as fiber splice points. The wide distribution of fiber that is required as part of evolution to 5G will result in a proliferation of these connection points.²¹ These splice points are used to provide access to fiber in the local community, to connect fibers from the same or multiple carriers, and to interconnect different fiber routes. Infrastructure companies could leverage ground space on USPS property to locate installations. Fiber splice point equipment is located outdoors, avoiding potential concerns about accessing shared indoor spaces.

“There may be opportunities for the Postal Service to partner with wireless carriers that are distributing processing components to the edge of their networks.”

Leasing indoor space for servers and edge computing

Some postal facilities may have space to host equipment and technologies that are necessarily developing in tandem with 5G, including edge computing. The basic premise of edge computing is that it brings computing resources closer to end users in order to reduce latency. Locating computing power closer to consumers is essential for realizing the full benefits of widespread 5G. Reliable low latency can improve the user experience of familiar applications, like video conferencing, streaming entertainment and gaming, and distance learning. But it will also be crucial for a widespread deployment of IoT devices, not just for consumers, but also for businesses, including manufacturing and industrial applications.

An Everyday Edge Computing Use Case

Many people understand the frustration of a glitching video conference, where everyone talks over one another due to audio delays. These technical problems could be reduced if the conferencing company’s servers were only a few miles away from participants rather than consolidated hundreds of miles away.

The deployment of edge computing has already begun. Recently Amazon and Verizon partnered to locate Amazon Web Services’ (AWS) infrastructure closer to the edge of Verizon’s 5G network.²² And it has been reported that traditional retailers could play a role in locating servers nearer to consumers.²³ For instance, Walmart is reportedly planning to build edge computing capacity that will be spread out among its retail locations, including capacity that could be rented out.²⁴ The Postal Service could explore if it has facilities with leasable space to locate servers closer to consumers.²⁵

While not all postal facilities are practical locations for server hosting, some post offices, and the over 280 mail processing facilities, may be able to host edge computing. There may be opportunities for the Postal Service to partner with wireless carriers that are distributing processing components to the edge of their networks. Likewise, as 5G matures, USPS could explore a collaboration with large Internet companies deploying data aggregation servers closer to their users. The physical space requirements of such initiatives range from a few square feet to a full data center. USPS could assess the feasibility of this opportunity by identifying which of its facilities meet space, power and connectivity requirements, and are close enough to consumers to facilitate edge computing.

21 Deloitte, “Deep Fiber: The Next Internet Battleground,” July 2017, <https://www2.deloitte.com/us/en/pages/consulting/articles/communications-infrastructure-upgrade-deep-fiber-imperative.html>.

22 “AWS and Verizon Team Up to Deliver 5G Edge Cloud Computing,” Amazon, December 3, 2019, <https://press.aboutamazon.com/news-releases/news-release-details/aws-and-verizon-team-deliver-5g-edge-cloud-computing>.

23 “How Edge Computing May Revamp, Revitalize Commercial Real Estate,” ZDNet, January 3, 2020, <https://www.zdnet.com/article/how-edge-computing-may-revamp-revitalize-commercial-real-estate/>.

24 “Walmart’s Secret Weapon to Fight Off Amazon: The Supercenter,” Wall Street Journal, December 21, 2019, <https://www.wsj.com/articles/walmarts-secret-weapon-to-fight-off-amazon-the-supercenter-11576904460>.

25 In a September 30, 2017 report to Congress, the Postal Service identified 369 properties with over 1.2 million square feet of excess space. See the following USPS OIG audit on this report: “Congressional Mandate on Excess Space,” USPS OIG, December 14, 2018, Report Number SM-AR-19-001, <https://www.uspsaig.gov/sites/default/files/document-library-files/2018/SM-AR-19-001.pdf>.

Edge computing may also benefit the Postal Service's future information technology needs. This could be particularly important as the Postal Service explores innovations that rely on increased computer processing, including autonomous and big data technologies at scale.²⁶ Thus, examining edge computing leasing opportunities could proceed in tandem with Postal Service efforts to develop its own edge network.

Figure 5: Leveraging Federal Assets for Broadband Deployment

Leveraging Postal Service Assets Aligns with Broader Federal Strategies

Leveraging USPS infrastructure for 5G deployment aligns with executive branch policy, as stated in Executive Order 13821, *Streamlining and Expediting Requests to Locate Broadband Facilities in Rural America*, and a Presidential Memorandum, *Supporting Broadband Tower Facilities in Rural America on Federal Properties Managed By the Department of Interior*. Executive branch policy prioritizes using all viable tools to assist in broadband deployment and adoption, including by expediting and streamlining requests for broadband infrastructure placement on federal property. The American Broadband Initiative (ABI), a collaboration of over 25 federal agencies, further defines federal strategy and agency roles. The Postal Service is not an executive agency or department that participates in the ABI, although it can voluntarily coordinate with ABI initiatives.

Implementation Considerations and Challenges

The following are some key considerations and challenges for implementing the opportunities noted above.

- **Limitations in deployment to leased facilities.** According to a Postal Service representative, 26 percent (8,423) of postal facilities are owned by the Postal Service, while most of the remaining 74 percent are leased.²⁷ Lease agreement terms may be an impediment to communications infrastructure deployment on postal facilities. A USPS representative indicated to the OIG that deployment on leased facilities is more challenging, but not impossible.²⁸ Therefore, USPS would need to assess the legal and financial feasibility of siting towers and antennas on leased facilities.
- **Physical condition and security challenges.** The physical condition of some postal facilities may be a challenge for installing communications equipment. Additionally, responsibility for ensuring the physical security of 5G antenna or equipment installations would need to be negotiated with partners on the initiatives, particularly for equipment that is on or near ground level, such as the fiber optic cable connection points. Recent instances of vandalism to 5G infrastructure perpetrated by anti-5G activists, including arson, highlight this concern.²⁹ To mitigate this risk, the Postal Service would need to arrange for adequate security for its infrastructure and network.
- **Permitting challenges and local-level concerns.** The prospect of densely deployed small cell 5G antennas has raised aesthetic concerns with some municipalities. Some cities are hesitant to permit the deployment of small cells, fearing it will result in new and unsightly infrastructure on every block.³⁰ These challenges could be an impediment to immediate implementation of 5G initiatives. Some post offices that are designated as historic or are in historic

26 Postal Service representatives noted to the OIG in an interview that they were interested in the benefits that edge computing could have for USPS in years to come. The Postal Service's Five-Year Strategic Plan identifies several goals for technological innovations. Autonomous and big data technologies are discussed on page 18. See: "The U.S. Postal Service Five-Year Strategic Plan," United States Postal Service, January 2020, <https://about.usps.com/strategic-planning/five-year-strategic-plan-2020-2024.pdf>.

27 A USPS Facilities representative provided leased and owned facility figures to the OIG in a May 22, 2020 email.

28 Placing towers on rented postal facilities may require separate negotiations with numerous individual landlords, rather than a standardized agreement for colocation at various Postal Service-owned buildings, for example.

29 See, for example, "U.S. Law Enforcement Warned of 5G/Coronavirus Conspiracy Threats," LightReading, May 18, 2020, <https://www.lightreading.com/5g/us-law-enforcement-warned-of-5g-coronavirus-conspiracy-threats/d/d-id/759730>.

30 To ameliorate these concerns, some equipment companies are marketing to these concerns and are offering equipment that better blends in with the community and existing infrastructure.

districts may face restrictions to external appurtenances, including towers and antennas. Therefore, the most desirable postal facility locations will be those for which zoning and similar restrictions are not impediments and are also centrally located with proximity to fiber routes.

Pilot Projects Could Demonstrate a Role for the Postal Service

To play a role in 5G deployment, the Postal Service would need to establish the economic viability and possible funding arrangements required to cover costs and potentially generate revenue. This includes evaluating private sector interest in partnering with the Postal Service. Although master lease agreements can simplify the negotiation of some terms, leasing and revenue sharing rates will

vary according to the number of vendors at a site and the competitiveness of the specific market. Many postal facilities are in areas that are less economically viable for *any* broadband deployment, let alone 5G coverage. Unserved areas have been left behind because they face significant economic challenges. However, current and planned federal funding for 5G could increase private sector interest and bring some rural postal facilities into consideration as sites for 5G deployment.

“The Postal Service has already begun exploring expanding tower deployment on postal facilities.”

One potential path forward for the

Postal Service is to test opportunities with carefully planned 5G pilot projects. As noted previously, there are many potential partners, including tower companies, major cellular carriers, and large Internet companies. Although these stakeholders bring different opportunities to the table, a 5G pilot project would allow the Postal Service to test the economic viability of its role and demonstrate its ability to facilitate federal efforts to promote 5G deployment. See Figure 6 for an example of a basic hypothetical model for a Postal Service 5G pilot project with a tower company.³¹

Figure 6: Model of a Potential 5G Partnership

Model of a 5G Pilot Partnership

A Postal Service pilot with a tower company to deploy 5G could be modeled along the following lines:

- USPS and the tower company select a state for 5G deployment.
- USPS provides the company with a list of owned facilities in the state and collects data on facility attributes, such as height, roof type (e.g., flat or vaulted), available indoor space and available outdoor space.
- The tower company works with cellular carriers to identify viable facilities for 5G and other wireless broadband deployment that align with carrier strategies.
- USPS signs agreement with company or carriers on lease rates/revenue sharing.
- Company or carriers are responsible for permitting and deploying technology.

³¹ This model was developed in consultation with Vantage Point Solutions, www.vantagepnt.com.

While this is only one example of a model for a pilot, similar principles could apply to partnerships with other stakeholders working to deploy 5G.³² In fact, the Postal Service has already begun exploring expanding tower deployment on postal facilities.³³ 5G technology should be considered as these conversations progress. By building on existing relationships and conducting outreach with potential new partners, the Postal Service can identify its most effective role in facilitating 5G deployment.

Bringing Broadband Connectivity to Underserved Regions and Populations

As discussed earlier in this white paper, the digital divide has been shrinking but many Americans are still effectively shut out of the benefits broadband has to offer. The recent COVID-19 crisis further underscores the need for broadband availability throughout the nation. Beyond a role in deploying 5G, the Postal Service could facilitate deployment of broadband connectivity to underserved regions and promote access to broadband-enabled services.

Facilitating Broadband Deployment in Rural Areas

The opportunities noted above for a Postal Service role in 5G deployment could also apply to bringing 4G LTE and other forms of broadband to currently unserved and underserved communities. For instance, a wireless Internet service provider told the OIG that carrier neutral colocation of antennas on postal facilities

could simplify bringing fixed wireless broadband to small, rural towns. Similarly, establishing Postal Service property as a fiber optic cable connection point could simplify providers' sometimes-confusing process of establishing where fiber is, thus better enabling expansion to rural communities.³⁴

For the Postal Service, these opportunities may face many of the same limitations as noted above for 5G: leased facilities may be challenging for deployment, security issues will need to be addressed, and there may be permitting challenges. Nevertheless, postal facilities could have a tremendous impact in communities that do not yet have high-speed broadband and are unlikely to be economically viable for 5G deployment in the near term.

Partnering to Foster Broadband-Enabled Services

The Postal Service could help connect people to services that rely on higher-speed broadband. OIG analysis found that there are 2,364 USPS facilities located within census blocks that are unserved or underserved in terms of broadband connectivity.³⁵ Three hundred and ninety three of these facilities are owned by USPS, and these may prove simpler for pursuing broadband partnerships than leased facilities. See [Figure 7](#) for a map of the USPS-owned facilities in unserved or underserved census tracts.

32 Effectively demonstrating the Postal Service's value and generating interest with a variety of potential partners could involve proactive industry outreach. An experienced attorney and engineer recommended to the OIG that the Postal Service could generate conversations and discussions by pitching the idea in trade publications and attending or sitting on panels at industry trade shows.

33 Postal Service representatives told the OIG that while they have initiated talks with tower companies to expand cellular tower deployment on postal facilities, COVID-19 has likely delayed any solicitation until fiscal year 2021.

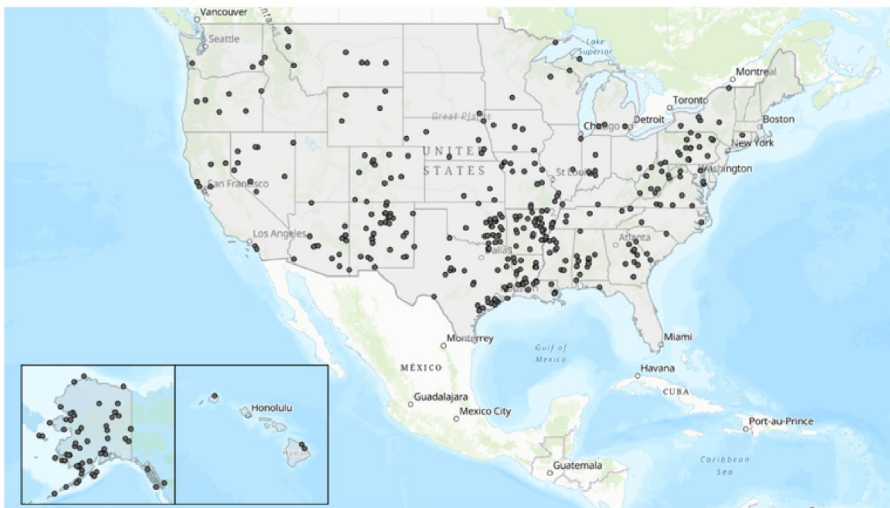
34 Low-Earth orbit satellites (LEOs) are another opportunity that are not discussed in detail in this white paper but hold promise for rural people who lack good terrestrial choices. LEOs have been launched by Amazon, OneWeb (now in bankruptcy), and Space Exploration Technologies Corp. (SpaceX). These satellites require line-of-sight to connect to regional broadband pipes at downlink/uplink stations. As the satellite moves, it will roam onto the next most viable downlink/uplink station. These companies will need many stations scattered throughout the U.S., which could be a fit for Postal Service facilities that are equipped with adequate server facilities, fiber backhaul, and appropriate antennas. No LEO systems have been fully deployed or vetted, so their potential remains to be seen.

35 This analysis used the FCC's Fixed Broadband Deployment Data from FCC Form 477, without satellite coverage data, from June 2019. Unserved or underserved census blocks were those with download speeds below 25 Mbps and with at least one resident in the block. As this does not include facilities *near* underserved areas, the Postal Service likely has an even greater reach into communities on the wrong side of the digital divide.

Figure 7: USPS-Owned Facilities in Unserved and Underserved Census Blocks

USPS-OWNED FACILITIES IN CENSUS BLOCKS WITHOUT BROADBAND

Mapped below are the 393 USPS-owned facilities that are located within census blocks that are totally unserved or have download speeds below 25Mbps. There may be additional postal facilities *near* underserved populations, and the broadband deployment data may also understate the total underserved population. Thus, there may be additional areas of opportunity.



Source: OIG analysis of FCC Form 477 fixed broadband deployment data (excluding satellite) as of June 2019 and USPS facilities data. The analysis included census blocks with download speeds below 25Mbps and with a population greater than zero.

Below are some opportunities for the Postal Service to help advance access to broadband-enabled services in or near unserved areas. While these services should only be undertaken if they cover their costs, they may not generate significant profits. They would, however, enable the Postal Service to make its ubiquitous infrastructure even more valuable to the American people.

A Digital Hub

Some post offices could serve as digital hubs, providing a central location for public connectivity to Wi-Fi near underserved communities. Across the country, anchor institutions such as libraries frequently offer free public Wi-Fi. Several federal representatives involved in broadband deployment told the OIG that offering public Wi-Fi could be a valuable role for a post office in or near underserved communities.³⁶ Even where there is limited lobby space, the Postal Service could provide basic access to the Internet via Wi-Fi or wireless broadband outside of the post office.

Some government agencies have taken steps to promote digital hubs in rural communities. For example, last year the U.S. Department of Veterans Affairs (VA) announced it had been working with Microsoft to bring broadband Internet access to rural areas of the country with large populations of veterans in need.³⁷ Microsoft's Airband initiative uses unlicensed spectrum in the TV band to deploy wireless broadband.³⁸ In fact, the Postal Service has held discussions with Microsoft about participating in the Airband initiative. A Postal Service representative told the OIG that a pilot was planned at a post office in Ohio, but it has been delayed due to the COVID-19 pandemic.

Additionally, [Figure 8](#) discusses the U.S. Department of Agriculture's (USDA) Community Connect Grant Program, which is an example of federal efforts promoting broadband where postal facilities could play a role as a digital hub.

³⁶ Postal Service representatives told the OIG that as the COVID-19 pandemic began, they explored working with the National Telecommunications and Information Administration (NTIA) to temporarily provide public Wi-Fi. However, as of the drafting of this report, the initiative has not moved forward.
³⁷ For details on the VA's partnership with Microsoft, see: "VA Partners with Microsoft to Bring Internet to More Veterans," Official Blog of the U.S. Department of Veterans Affairs, June 28, 2019, <https://www.blogs.va.gov/VAntage/61913/multiple-vha-partnerships-work-bring-veterans-online/>.
³⁸ "An Update on Connecting Rural America," Microsoft, December 3, 2018, https://blogs.microsoft.com/uploads/prod/sites/5/2018/12/MSFT-Airband_InteractivePDF_Final_12.3.18.pdf, p. 12.

Figure 8: USDA's Community Connect Grant Program

Community Connect: A Program Establishing Digital Hubs

The USDA's Community Connect Grant Program is designed to bring assistance to rural, economically challenged communities lacking broadband service, including truly remote areas and some Tribal lands. It typically receives \$30 to \$40 million annually from Congress and distributes around \$2 million per project. One requirement of Community Connect grant awardees is to establish community centers that provide two computer access points and wireless broadband access. A USDA representative told the OIG that grant recipients often want to use existing space, like a room in a school or library, but in many communities the program targets do not have these. Consequently, some projects need to erect a new building. There may be postal facilities in or near some of these unserved communities that have space requirements to qualify for the program. Or, if space is not available, the program could pay for an addition to the postal facility rather than creating a whole new structure.

Facilitating Telehealth

In rural areas, telehealth provides access to specialists and services that may not be otherwise available within the community. But patients without quality broadband cannot access such services at home. The Postal Service could

explore partnerships locating telehealth terminals or kiosks in some rural facilities to monitor vitals and allow those lacking adequate broadband to get remote check-ups.³⁹

An example of a potential telehealth partnership is the Veterans Health Administration's (VHA) Accessing Telehealth through Local Area Stations (ATLAS) program. The VHA is working with Phillips and Walmart to establish locations for Veterans to access free broadband to connect to VA providers by video.⁴⁰ According to a VHA manager, the Postal Service had concerns about the space requirements for participating in a telehealth partnership. The need for an attendant to staff the terminal could present another challenge for many postal facilities. However, the Postal Service could investigate if there are facilities that would meet the space requirements.⁴¹

Additionally, siting towers and antennas on postal facilities could encourage telehealth. A Bureau of Land Management (BLM) representative told the OIG that the agency worked with a telehealth provider in rural Alaska to extend tower networks to allow remote education and telemedicine in rural areas. Similar partnerships may be possible for the Postal Service.

Public Safety Networks

Supporting public safety communications networks could be a natural fit for postal facilities. In particular, the Postal Service could partner to help expand the First Responder Network Authority (FirstNet). Created in response to challenges encountered by first response communications networks on September 11, 2001, FirstNet allows first responders access to a nationwide public safety broadband

“Supporting public safety communications networks could be a natural fit for postal facilities.”

39 The OIG has previously touched upon opportunities for the Postal Service to coordinate and collaborate with wellness organizations to offer services to older Americans nationwide. See: “The Postal Service Role in Delivering Wellness Service and Supplies,” USPS OIG, July 22, 2015, https://www.uspsoidg.gov/sites/default/files/document-library-files/2015/rarc-ib-15-004_the_postal_services_role_in_delivering_wellness_services_and_supplies_0.pdf.

40 As of July 2020, all but one of the ATLAS sites were temporarily closed due to the COVID-19 pandemic. See: “VA and ATLAS,” U.S. Department of Veterans Affairs, <https://connectedcare.va.gov/partners/atlas>; See also, Philips, “Virtual Care, Anywhere, for Veterans,” <https://www.usa.philips.com/healthcare/government/our-approach/partnerships-and-collaborations/atlas>.

41 A VHA manager told the OIG that he believed the VHA approached USPS at the request of a U.S. Senator. The VHA manager said that conversations about USPS participation did not proceed after initial conversations.

network and connects rural areas with larger networks.⁴² BLM representatives told the OIG that the agency has worked with AT&T on FirstNet. USPS could also work with FirstNet to use postal facilities for the placement of antennas and communications equipment. Authorities could park outside of postal facilities in target areas to gain access to a Wi-Fi connection to transmit electronic records.

Remote Education

During the COVID-19 pandemic students across the country transitioned to digital alternatives to the classroom, and some face the prospect of ongoing digital learning. This creates major challenges and disparities for families with limited Internet access. In some school districts public-private partnerships have helped support distance learning. This augments the FCC's "E-rate" program, which provides discounts for schools to obtain affordable telecommunications and Internet access but does not help enable access to broadband at students' homes.

A Department of Education representative suggested to the OIG that the Postal Service could participate in local-level public-private partnerships with school districts to promote broadband access for students via Wi-Fi hotspots at post offices. There are some areas where students have found that fast food restaurants with Wi-Fi or driving some distance to get a stronger cellular signal are the best work arounds for poor or no Internet at home.⁴³ In these scenarios, a post office could provide another alternative. Such a partnership could also entail a role distributing paper packets with educational materials to families without quality broadband access.

Kiosks to Facilitate Access

The Postal Service could host kiosks that provide access to government services reliant on or related to broadband. For example, post offices near communities with lower broadband subscription rates could have kiosks enabling members of the community to sign up for the FCC's Lifeline program. This program provides low-income consumers with a discount on monthly broadband Internet access service.⁴⁴ The kiosks could also provide information on technology or provider discounts, and digital literacy training.⁴⁵

Improving Broadband Data Collection and Data Availability

Data on nationwide connectivity are an important component of federal efforts to promote 5G and broadband deployment. Fixed and wireless coverage maps influence the distribution of federal funds to promote broadband in the regions that are in most need, making the accuracy and reliability of the underlying data of paramount importance.⁴⁶ Likewise, to effectively leverage federal facilities for broadband deployment, service providers need access to data on available assets that meet their needs.⁴⁷ The Postal Service could harness its assets to facilitate data collection efforts and make facilities data available to potential partners.

Leveraging USPS for Data Collection

The Postal Service's reach to nearly all neighborhoods in the nation makes it a valuable resource in solving data collection issues. Many analysts, including the FCC itself, have noted that the FCC's current maps of broadband deployment

42 See the FirstNet website at www.firstnet.gov. See also: "FirstNet CEO: AT&T Has 20 Rural Partners, Wants More," *Telecompetitor*, April 24, 2019, <https://www.telecompetitor.com/firstnet-ceo-att-has-20-rural-partners-wants-more/>.

43 The following articles discuss issues facing students and schools in unserved areas: "Distance Learning Despite the Broadband Gap," Teach for America, April 7, 2020, <https://www.teachforamerica.org/stories/distance-learning-despite-the-broadband-gap>; and "How Rural Students Are Left Behind in the Digital Age," Teach for America, January 17, 2020, <https://www.teachforamerica.org/stories/how-rural-students-are-left-behind-in-the-digital-age>.

44 "Lifeline Program for Low-Income Consumers," FCC, <https://www.fcc.gov/general/lifeline-program-low-income-consumers>.

45 The non-profit organization EveryoneOn.org provides location specific information on technology and Internet discounts, as well as digital literacy training.

46 "Broadband Data and Mapping: Background and Issues for the 116th Congress," Congressional Research Service, October 16, 2019, <https://fas.org/sgp/crs/misc/R45962.pdf>, p. 7.

47 Leveraging federal facilities for broadband deployment and making data on federal assets available to providers are key action plans in the American Broadband Initiative Milestones Report. See: "American Broadband Initiative Milestones Report 2019" National Telecommunications and Information Administration, February 2019, https://www.ntia.doc.gov/files/ntia/publications/american_broadband_initiative_milestones_report.pdf, pp. 22-23.

do not always match the actual coverage experienced by some consumers.⁴⁸ A potential solution is for the FCC to work with the Postal Service to collect more

“The Broadband DATA Act, signed into law in March 2020, requires the FCC to test the feasibility of a partnership with the Postal Service to facilitate broadband deployment data collection on an ongoing basis.”

accurate data.⁴⁹ In fact, the Broadband DATA Act, signed into law in March 2020, requires the FCC to test the feasibility of a partnership with the Postal Service to facilitate broadband deployment data collection on an ongoing basis.⁵⁰

The methods for collecting these data range from apps on smartphones that measure a carrier’s signal speed and quality, to mounting radio equipment and antennas on vehicles to collect much more intricate measurements of connection quality. As of the drafting of this report, the FCC and Postal Service were engaged in initial conversations on a potential collaboration. Figure 9 notes some of the basic cost and operational considerations of leveraging USPS assets for data collection.

Figure 9: Implementation Considerations

Implementation Considerations for USPS in Data Collection

The costs for collecting mobile performance data vary depending on the detail of performance data needed. The unit cost for sophisticated equipment to conduct “drive testing” of mobile coverage starts as high as \$30,000 and would require installing equipment on vehicles. Deploying more sophisticated test drive equipment might be challenging in rural areas where carriers use their own vehicles, which is precisely where accurate data may be most needed.

A potentially cost effective and less intrusive solution could involve leveraging mobile apps on cell phones or the handheld Mobile Delivery Device (MDD) scanners used by mail carriers. While this method cannot capture the detailed performance data of more costly drive test units, apps can capture mobile signal speed and quality. FCC representatives told the OIG that they have had initial discussions with the Postal Service to explore if postal carriers’ MDDs can be adapted to passively capture mobile performance data. Even if configuring the MDDs for this purpose proves technically challenging or impractical, pairing cellular apps with the postal delivery network in a target area for measurement could be less costly than alternatives.

48 “Mobility Fund Phase II Coverage Maps Investigation Staff Report,” FCC, December 4, 2019, <https://docs.fcc.gov/public/attachments/DOC-361165A1.pdf>, p. 52, paragraphs 74 and 78; and “2019 Broadband Deployment Report,” FCC, May 29, 2019, p. 13, footnote 92, <https://docs.fcc.gov/public/attachments/FCC-19-44A1.pdf>.

49 A prior Government Accountability Office (GAO) report discussed a role for USPS in data collection See: “Offering Nonpostal Services through Its Delivery Network Would Likely Present Benefits and Limitations,” GAO, December 2019, <https://www.gao.gov/assets/710/703324.pdf>. FCC Commissioner Jessica Rosenworcel has also noted a potential role for USPS in data collection, and the idea was noted in a FCC notice of proposed rulemaking. See “Better Maps, Better Connectivity: Getting the Data Close to the Broadband Gap” Remarks of Commissioner Jessica Rosenworcel to the Pew Charitable Trusts, December 11, 2018, <https://docs.fcc.gov/public/attachments/DOC-355485A1.pdf>; and “Report and Order and Second Notice of Proposed Rulemaking, FCC 19-79,” FCC, August 6, 2019, <https://docs.fcc.gov/public/attachments/FCC-19-79A1.pdf>, p. 51, paragraph 126.

50 42 U.S.C. § 644(b)(2)(B)).

More accurate broadband data would better inform how and where to focus future efforts to promote 5G and close the overall digital divide. FCC representatives told the OIG that, if feasible, working with the Postal Service on data collection could resolve issues of bias that arise in other data collection methods.⁵¹ The Postal Service could be particularly valuable in rural areas because companies that map and sell coverage data often do not go beyond 10 miles of large cities, meaning rural data are not always detailed or validated.⁵² This makes the Postal Service's large network in rural areas well situated to measure rural coverage.

Mobile network data could also be valuable to state governments and private industry. The Postal Service would have to consider legal restrictions that may preclude the commercial sale of such data.⁵³ Nevertheless, the Postal Service could play a role in data collection in many ways. USPS and policymakers should explore the technical feasibility, costs, and benefits of these opportunities.

Improving Data Availability

To promote collocation of communications equipment on its facilities, the Postal Service could work to make data on viable postal facilities accessible to potential industry partners or lessors. This step would be in line with the efforts of other federal agencies in the American Broadband Initiative (ABI). In fact, the BLM's Joint Overview-Established Locations (JOEL) map, which is a publicly available map identifying existing and potential broadband location sites on federal property, recently added a layer of data of postal facilities.⁵⁴ The Postal Service could potentially participate in other mapping efforts as part of the ABI and provide detailed, accurate, and timely data for its available assets on an

ongoing basis.⁵⁵ See [Appendix B](#) for more information on efforts to map federal assets to promote broadband deployment.

In addition to ensuring its facilities data are available on existing federal platforms, the Postal Service could independently share facilities data with service providers on its own platform. One challenge is that the facility attributes that would be most useful, such as building height and roof type, may require USPS to proactively collect and consolidate these data.⁵⁶ USPS would also have to assess the extent to which it can collect and share data on facilities it leases. Collecting and consolidating such data will likely be an important part of any expanded effort for 5G or broadband deployment. Therefore, if USPS pursues such efforts, it should consider the best strategy for making facilities data more broadly available to service providers.

Conclusion

If the true value of broadband Internet was not fully appreciated before, the COVID-19 pandemic has made it abundantly clear. Broadband offers educational, health, financial and work benefits that we increasingly rely on as a part of daily life. Unfortunately, those finding themselves on the other side of the digital divide will be left out and left behind. Providing high-quality broadband service to unserved and underserved parts of the nation will be a critically important endeavor for our nation in the years to come. With its ubiquitous footprint throughout the country, the Postal Service stands poised to play a role bringing 5G and broadband where it is most needed.

With the right partnerships, there are a variety of ways the Postal Service could work to help foster 5G deployment. Postal facilities can host 5G infrastructure and

51 "Report and Order and Second Notice of Proposed Rulemaking, FCC 19-79," FCC, August 6, 2019, pp. 49-50, paragraph 123, <https://docs.fcc.gov/public/attachments/FCC-19-79A1.pdf>.

52 To illustrate concerns around the accuracy of data for rural areas, in 2019 the mostly rural state of Vermont released a report challenging the accuracy of wireless coverage data and describing the data's impact on state eligibility for FCC grants. See: "Mobile Wireless Analysis and Results from Drive Test," State of Vermont Department of Public Service, January 16, 2019, <https://publicservice.vermont.gov/announcements/mobile-wireless-analysis-and-results-drive-test>.

53 Under the Postal Accountability and Enhancement Act, the Postal Service may only sell non-postal products or services to the public that were offered at the time the law was enacted (or January 1, 2006), and that the Postal Regulatory Commission authorized to continue. 39 U.S.C. § 404(e).

54 "American Broadband Initiative Progress Report," NTIA, June 2020, https://www.ntia.gov/files/ntia/publications/abi_progress_report_june2020.pdf, p. 4.

55 In addition to Department of Interior assets, JOEL also includes other agency data from the General Services Administration's (GSA) Federal Real Property Profile (FRRP MS) of executive branch property, which is a database of all real property under the custody and control of executive branch agencies. The National Telecommunication and Information Administration's National Broadband Availability Map (NBAM) is another platform mapping assets available for broadband deployment. NBAM contains non-public data that may be business sensitive and is not open to the public, but it is intended to inform policymakers in policy planning and investment decision-making. The JOEL Map can be accessed at the following link: <https://blm-egis.maps.arcgis.com/apps/webappviewer/index.html?id=230ae94d676e4e688143d84078be78f8>.

56 A Postal Service representative told the OIG that they were unaware of databases that identified postal facility structure types or heights.

edge computing technology that will bring critical network elements closer to end users. It can help facilitate telehealth, remote learning, public safety, and other vitally important services. By improving broadband deployment data collection, the Postal Service can help policymakers determine where to deploy funding to maximize benefits.

Realizing this potential will require creativity and forward-looking vision and partnerships. While any projects will need to cover their costs, this undertaking is less about revenue generation, and more about providing a critical public service. By participating in this important endeavor, the Postal Service would take fullest advantage of its vast infrastructure and further cement its already critically important role in American life.

Appendices

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Appendix A: Methodology

This project focused on answering three questions:

- Where in the nation is 5G and broadband service lacking, and what are the reasons behind it?
- What role(s), if any, can the Postal Service play in helping to facilitate 5G and broadband deployment, including to unserved/underserved areas?
- Are there other opportunities for USPS to expand access to services supported by high-speed broadband nationwide?

To research these questions, the OIG reviewed secondary research and conducted spatial analysis, contracted with a subject matter expert, and interviewed subject matter experts and federal agency representatives.

- **Reviewed secondary research and conducted spatial analysis.** The OIG reviewed research on the state of 5G and broadband deployment and policy, along with prior OIG studies on broadband deployment, and other relevant documentation. We also accessed publicly available broadband deployment data and Postal Service data to perform spatial analysis.
- **Contracted with a subject matter expert.** The OIG contracted with consultant Vantage Point Solutions, an expert on broadband deployment,

for technical guidance and consultation on industry developments and opportunities for the Postal Service.

- **Interviewed subject matter experts and federal agency representatives.** In addition to speaking with Postal Service management, the OIG interviewed several industry experts on 5G and broadband deployment and policy. This included broadband engineers and lawyers, the CEO of a regional fixed wireless provider and broadband experts with major technology companies and a trade association representing wireless carriers. The OIG also interviewed representatives from the following agencies:
 - Federal Communications Commission,
 - National Telecommunications and Information Administration,
 - U.S. Department of Interior Bureau of Land Management,
 - U.S. Department of Agriculture,
 - U.S. Department of Education,
 - General Services Administration, and
 - U.S. Department of Veterans Affairs Veterans Health Administration.

Appendix B: Federal Broadband Mapping Efforts

The following are federal sector maps under development to help promote broadband deployment:

- **The Joint Overview-Established Locations (JOEL) Map.** In 2019 the Bureau of Land Management (BLM) created the Joint Overview-Established Locations (JOEL) map.⁵⁷ This publicly available map identifies existing and potential broadband location sites on federal property. The map includes Department of Interior telecommunications sites located on federally managed lands and agency contact information to encourage greater insight into broadband infrastructure colocation opportunities. JOEL also includes all federal real property sites identified in the GSA Federal Real Property Profile, a database of real property under the custody and control of executive branch agencies.⁵⁸
- **The National Broadband Availability Map.** The National Telecommunications and Information Administration has created a geographic information system platform called the National Broadband Availability Map (NBAM) which allows for the visualization and analysis of federal, state, and commercially available data sets on broadband availability. Because the platform contains non-public data that may be business sensitive, it is not currently publicly available, but is intended to inform policymakers in policy planning and investment decision-making.⁵⁹ Data collected by the Postal Service through any future collaboration with the FCC to improve coverage maps could also potentially be included in NBAM.

57 "Interior Launches New Effort to Facilitate Broadband Deployment in Rural America," U.S. Department of the Interior Bureau of Land Management, February 13, 2019, <https://www.blm.gov/press-release/interior-launches-new-effort-facilitate-broadband-development-rural-america>. BLM's JOEL Map can be located at the following link: <https://blm-egis.maps.arcgis.com/apps/webappviewer/index.html?id=230ae94d676e4e688143d84078be78f8>.

58 Data elements such as height and agency point of contact were recently added to the Federal Real Property Profile (FRPP) to promote broadband deployment on federal assets. These elements were required by the "Making Opportunities for Broadband Investment and Limiting Excessive and Needless Obstacles to Wireless Act" (MOBILE NOW Act), enacted on March 23, 2018 as part of the Consolidated Appropriations Act 2018 (Pub. L. 115 – 141). See: "2019 Guidance for Real Property Inventory Reporting" GSA, June 7, 2019, <https://www.gsa.gov/cdnstatic/FY%202019%20FRPP%20DATA%20DICTIONARY.pdf>, page 4. According to the June 2020 American Broadband Initiative Progress Report, The GSA GIS Center for Excellence added data layers for Postal Service properties to the FRPP map. See: "Appendix A—Status of Milestones Report Actions," NTIA, https://www.ntia.gov/files/ntia/publications/abi_appendixa.pdf, page 7.

59 "NBAM Facts," Broadband USA, June 4, 2020, <https://broadbandusa.ntia.doc.gov/ntia-resources/nbam-faqs>.

Appendix C: Management's Comments



September 8, 2020

Evgeni Dobrev
Acting Manager, Operations Central
Research and Insights Solution Center

SUBJECT: Next Generation Connectivity: Postal Service Roles in 5G and Broadband Deployment Final Review Draft (Project Number RISC-WP-XX-XXX)

Thank you for the opportunity to review and comment on the white paper, Next Generation Connectivity: Postal Service Roles in 5G and Broadband Deployment. US Postal Service has reviewed the document which outlines partnership opportunities in the development of 5G including: leveraging our physical footprint for broadband antenna deployment, fiber optics infrastructure colocation, and providing indoor space for edge computing.

US Postal Service is engaged in ongoing discussions with the FCC Office of Engineering and Technology to determine how best to support the broadband mapping requirements set forth in the Broadband DATA act. A pilot program utilizing sensors mounted on USPS delivery vehicles and fixed assets to collect broadband signal data is being explored.

The US Postal Service Digital Business team is continually evaluating prospects to leverage our physical infrastructure to generate revenue and support the public good. While many organizations have shown interest, it is challenging to find partners willing to provide the capital required.

Responsible Officials:

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on 2020-09-08 13:18:07 CDT

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