United States Government Accountability Office

Report to Congressional Requesters

September 2016

U.S. POSTAL SERVICE

Information on How Broadband Affects Postal Use and the Communications Options for Rural Residents

GAO Highlights

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Information on How Broadband Affects Postal Use and the Communications Options for Rural Residents

Why GAO Did This Study

As broadband availability grows, Americans—including those in rural areas—increasingly partake in communications and services offered via the Internet. Some of these Internet services have changed how individuals use USPS. Though many factors influence use of postal services, understanding the relationship between broadband use and the use of postal services is critical to both the future of postal services overall and the communication options available to rural residents. GAO was asked to examine the relationship between broadband and postal use, particularly in rural areas.

This report addresses the relationship between broadband use and the use of USPS's (1) mail services, (2) package and shipping services, and (3) post offices, particularly in rural areas. To address these objectives, GAO reviewed literature on broadband and mail trends, factors associated with postal and broadband use, and the role of post offices in rural America. GAO conducted regression analyses using 2007-2014 data, the most recent available, from the USPS HDS, which collects information from a nationally representative sample of households. GAO interviewed local stakeholders, such as officials from post offices and Internet service providers, in five rural areas, chosen based on recent deployment of broadband and other factors. GAO also interviewed 11 postal experts, chosen based on participation in previous GAO work and postal conferences.

GAO is not making recommendations in this report. USPS did not have any comments on the draft report.

What GAO Found

Broadband use has in recent years been associated with reduced use of First-Class Mail. Continued declines as a result of broadband, however, are uncertain. Broadband access to various Internet services, especially online bill paying, is associated with reduced use of transaction mail, a subset of First-Class Mail. GAO analysis of the U.S. Postal Service's (USPS) Household Diary Survey (HDS) data from 2007-2014 found that households using broadband to access Internet services tended to send less transaction mail than other households, controlling for age, income, and education. However, GAO found that in recent years broadband use may not have had a statistically significant effect on correspondence mail, a subset of First-Class Mail that includes letters and greeting cards. Experts GAO spoke with had mixed views on the future of First-Class Mail as a result of broadband use, with only 4 of the 11 experts expecting decreases in First-Class Mail in the short term. Several experts and officials suggested that Internet privacy and security concerns, as well as many individuals having already changed postal habits in response to the Internet, are among the factors that could be contributing to a slowed rate of "electronic diversion" from mail. With regard to rural areas, GAO analysis of HDS data suggests that rural households without broadband tended to send more transaction and correspondence mail than non-rural households without broadband in recent years. The officials in rural areas GAO interviewed generally agreed that residents of rural areas value mail and postal services for a variety of reasons, including that they have fewer retail alternatives and trust USPS services. Despite this relationship, GAO found that the subset of rural households with broadband were not statistically different in the volume of correspondence mail sent compared to non-rural households. In rural areas, two groups of businesses that GAO spoke with also noted that improved Internet access could result in mail volume declines.

E-commerce continues to have a strong effect on USPS package and shipping volumes. GAO analysis of HDS data found that broadband use in the home was associated with sending and receiving more packages with USPS in recent years. This analysis also found that households in rural areas made greater use of package and shipping services, a view echoed in interviews with officials in rural areas. While research and experts interviewed by GAO generally agreed that USPS's package business will grow in the short term, USPS is likely to face longer-term challenges, such as increased competition in the delivery market.

It is unclear what role broadband use has played in the reduction in post office visits in recent years. GAO analysis of HDS data found no statistically significant relationship between broadband use and post office visits. However, GAO found that rural households tend to visit post offices more regardless of broadband use. Local stakeholders GAO interviewed said that rural residents may use post offices at higher rates because post offices play a valuable social role in small communities and that alternatives for certain services, such as money orders, are lacking. To balance the benefits of its postal retail network with the high costs of some facilities, USPS is undertaking various initiatives. Despite these efforts, balancing the benefits of a robust network with the costs of maintaining that network, especially in rural areas, will remain a challenge for USPS.

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Contents

Abbreviations

BIP	Broadband Initiatives Program
DSL	digital subscriber line
FCC	Federal Communications Commission
HDS	Household Diary Survey
ISP	Internet service provider
Mbps	megabytes per second
OIG	Office of Inspector General
POStPlan	Post Office Structure Plan
PRC	Postal Regulatory Commission
Recovery Act	American Recovery and Reinvestment Act of 2009
RUCA	Rural-Urban Commuting Area Codes
USDA	United States Department of Agriculture
USPS	United States Postal Service

September 12, 2016

The Honorable Heidi Heitkamp
Ranking Member
Subcommittee on Regulatory Affairs and Federal Management
Committee on Homeland Security and Governmental Affairs
United States Senate

The Honorable Claire McCaskill
United States Senate

From the early days of sending and receiving U.S. mail to the rollout of telephone lines across the country, access to various forms of communication has long been important for all Americans, but particularly for geographically isolated rural residents. As the United States has continued to increase the availability of broadband, Americans—including those in rural areas—increasingly partake in communications and services offered via the Internet. Some of these Internet services have changed how individuals use the U.S. Postal Service (USPS). For example, traditional USPS activities such as mailing a letter or paying a bill can now be accomplished by sending an e-mail or using online banking. This trend is referred to as "electronic diversion." USPS has restructured its services and network in various ways to try to remain competitive in a digital world. Some of these changes have affected rural areas, such as reducing hours at rural post offices. Though use of postal services can be influenced by many factors, including general economic conditions, understanding the relationship between broadband use and the use of postal services is critical to both the future of postal services overall and the communication options available to rural residents.

You asked questions about USPS's restructuring efforts and their effects on services to rural residents and whether there is enough understanding of the relationship between broadband and postal use to properly inform USPS's actions. You requested that we examine the relationship between broadband use and use of postal services, particularly in rural areas. We examined the relationship between the use of broadband and the use of USPS's: (1) mail services, (2) package and shipping services, and (3) post offices, particularly in rural areas.

To assess the relationship between fixed broadband use and the overall use of postal services in recent years, we first identified factors associated with postal and broadband use through a review of academic

and government literature.[1] Using the results of this literature review to inform our work, we conducted regression analyses using data for the period 2007 through 2014 from the USPS Household Diary Survey (HDS).[2] Conducted annually, HDS obtains information from a nationally representative sample of over 5,200 households to provide a comprehensive and continuous description of the mail originating from and arriving in American households. Based on interviews with USPS officials and review of documentation about how the survey was designed and conducted, we concluded that the HDS data were sufficiently reliable for the purpose of analyzing relationships between broadband use and postal use while accounting for other variables of interest. To further assess the relationship between broadband availability and online bill paying, we analyzed data for the period 2010 through 2015 provided by a regional bank with operations in Louisiana on customers eligible for online bill paying services as well as broadband provider data from the National Broadband Map and the Federal Communications Commission (FCC). Based on interviews with FCC officials and officials with the regional bank, we concluded that these data were sufficiently reliable for the purpose of analyzing the relationship between broadband availability and online bill paying among customers of that bank. We also conducted analysis using USPS retail facility data as of January 2016 and FCC's broadband subscriber data, to describe broad patterns in postal retail availability and broadband use. Based on interviews with USPS officials, we concluded that the USPS's retail facilities data were sufficiently reliable for this purpose. Based on interviews with FCC officials and a review of documentation, we concluded that the broadband subscriber data were also sufficiently reliable for this limited purpose.

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[1]There are several types of fixed broadband service that generally share the characteristic of utilizing a physical transmission path to connect a user to the Internet—predominantly through coaxial cable, copper wire, or fiber-optic cable. Unless otherwise noted, throughout this report we refer to any form of fixed, high-speed, Internet connection as "broadband." We do not define broadband with a minimum connection speed in this report because our primary data source as well as our interview subjects did not explicitly define broadband with a speed threshold. Further, we did not assess the relationship of mobile communications technology on postal demand. Although advances in technologies and functionalities have made mobile broadband services more versatile and useful to consumers, there are important differences between mobile and fixed broadband that make the services imperfect substitutes, such as unreliability of mobile service and computational limitations of mobile devices.

[2]The most recent year for which data were available from the HDS for our analysis was 2014.

To better understand use of Internet and postal services in rural areas and expand on the findings of our quantitative analysis, we identified five case study areas that had recently received broadband access through receipt of broadband infrastructure loans or grants from the U.S. Department of Agriculture (USDA) that met our definition of rural, and that were geographically diverse.[3] These areas were in Louisiana, Missouri, New Mexico, North Dakota, and Virginia. In each of these areas, we interviewed officials with local USPS post offices, economic development entities and businesses, and Internet service providers (ISP) about the relationship between broadband and use of postal services. We visited case study areas in two states, Missouri and Virginia, where we conducted interviews. In total, in the relevant areas in all five states, we interviewed officials at nine USPS post offices[4] and five ISPs, and conducted five meetings where we brought together economic development and business officials from our case study areas.[5] While findings from our case studies cannot be generalized to all rural areas, they provide illustrative examples of the relationship between broadband and postal services, as well as perspectives from stakeholders in rural areas. We also used our literature review to identify research on the role of post offices in rural America.

To better understand the implications of our findings for USPS, we conducted semi-structured interviews with 11 postal experts. We selected individuals and entities from a variety of backgrounds based on their roles as experts in previous GAO reports and participation in recent postal conferences. We also discussed our findings with officials from USPS and the Postal Regulatory Commission (PRC), which is an independent

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[3]For the purposes of this report, we defined "rural" as areas identified as rural by the USDA's Rural-Urban Commuting Area Codes (RUCA). The USDA Economic Research Service's 2013 RUCA data incorporates Census tract commuting patterns and other measures of "rurality" in addition to population density. RUCA has 10 tiers along a spectrum of rurality, each of which is further broken down into secondary codes. We used the 4-tiered data consolidation, which collapses the 10 RUCA tiers into 4, where the bottom 2 tiers are considered rural.

[4]These officials were generally Postmasters but, especially at smaller offices, were sometimes Officers-in-Charge.

[5]The participants of these meetings varied by location, but included representatives of local chambers of commerce, economic development corporations, individual businesses, and other entities.

agency that conducts regulatory oversight of USPS. For more detailed information about our scope and methodology, see appendix I.

We conducted this performance audit from October 2015 to September 2016 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Postal Trends

Challenging economic conditions, a changing business environment, and declining mail volumes have contributed to USPS's revenue shortfall and inability to cover its expenses and financial obligations. USPS has incurred 9 consecutive years of net financial losses and over $125 billion in unfunded liabilities as of fiscal year 2015. As a result, USPS has remained on GAO's High Risk List since 2009.[6]
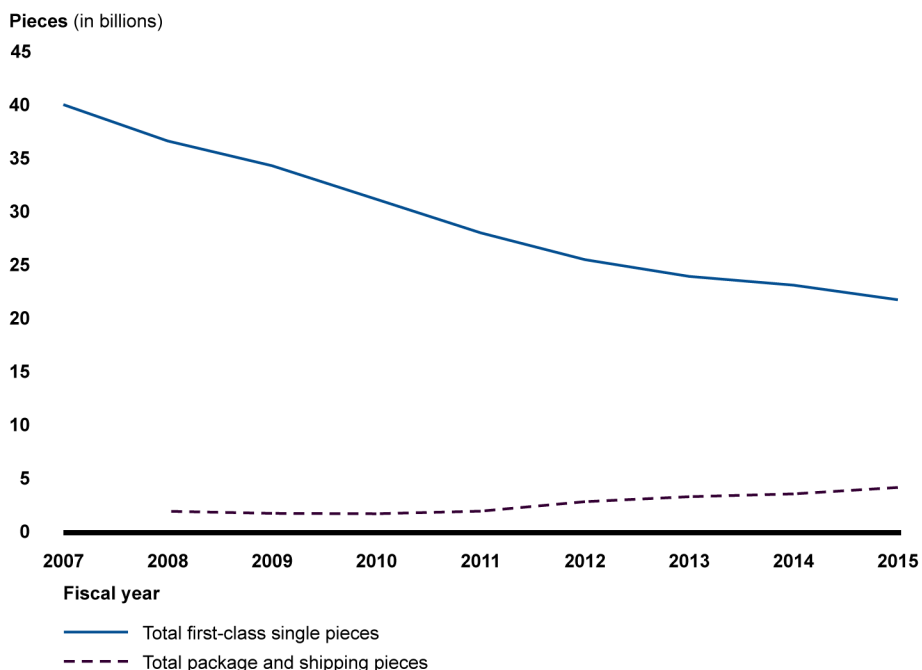
USPS's financial condition is largely attributable to a decline in mail volume. Overall, mail has declined by 28 percent from its peak—213 billion pieces—in fiscal year 2006 to about 154 billion pieces in fiscal year 2015. Volume for First-Class Mail, USPS's most profitable product, has significantly declined from its peak in fiscal year 2001. For instance, First-Class Single Piece mail—that is, all mail bearing postage stamps such as bill payments, personal correspondence, cards, and letters—has declined by about half over the last 9 years (see fig. 1). Although overall mail volumes have declined, USPS packaging and shipping services have experienced double-digit growth in recent years, largely as a result of electronic commerce.[7] USPS package volume roughly doubled from 2008

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[6]GAO, *High Risk Series: An Update*, GAO-15-290 (Washington, D.C.: Feb. 11, 2015).

[7]Electronic commerce or "e-commerce" is a term for any type of business, or commercial transaction that involves the transfer of information across the Internet.

to 2015. Package and shipping services, though, are sensitive to economic changes and have a lower profit margin than First-Class Mail.[8]

Figure 1: U.S. Postal Service Total Single-Piece First-Class Mail, and Package and Shipping Pieces, Fiscal Years 2007—2015

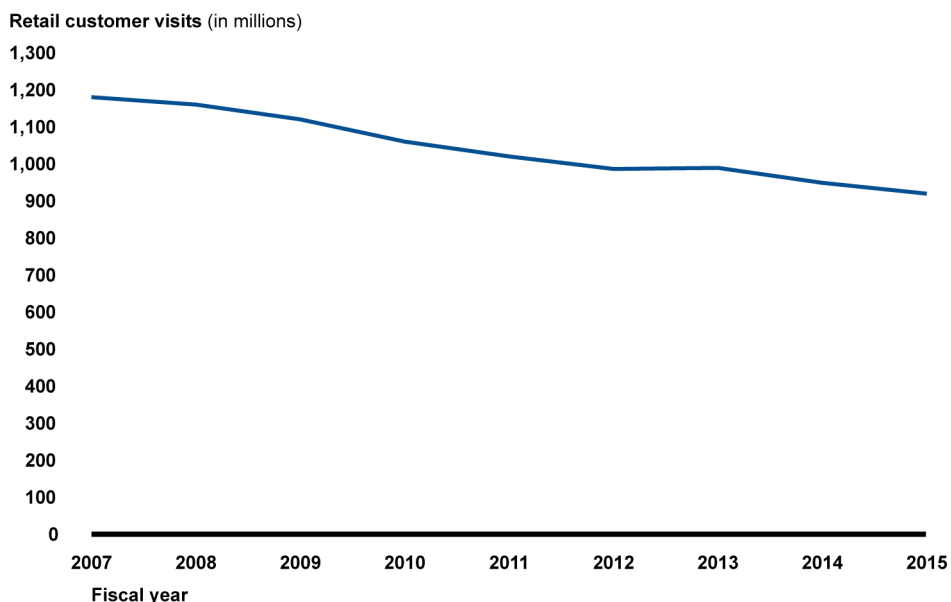Source: GAO analysis of U.S. Postal Service data. | GAO-16-811

Note: Single-Piece First-Class Mail includes First-Class cards, letters, flats, and parcels. Packages and Shipping includes Package Services, Priority Mail, Priority Mail Express, Parcel Return Service, Parcel Select, and, since 2011, First-Class Packages. Equivalent figures for Packages and Shipping volume are not available prior to 2008 because of changes in product types.

In addition to mail and package delivery, USPS maintains its retail network of post offices across the country. In fiscal year 2015, there were approximately 31,600 total postal managed retail offices. A key part of USPS's revenue stream, post offices contributed a little over half of the

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[8]USPS has said it must earn about $2.50 in Shipping and Packages revenue to replace the profitability lost from each $1 of First-Class Mail revenue because the costs of transporting and delivering packages are higher than letters.

$19 billion in total retail revenue that USPS earned in fiscal year 2015.[9] USPS has reported decreases in retail revenue at its post offices, as well as fewer retail visits (see fig. 2). Online revenues through the USPS website (usps.com), though, generated over $1 billion in fiscal year 2015. USPS also has partnerships with retailers that provide another 64,000 locations for customers to access stamps and USPS services.

Figure 2: U.S. Postal Service's Total Retail Customer Visits, 2007-2015

Source: GAO presentation of U.S. Postal Service data. | GAO-16-811

Note: Retail customer visits include just those visits that involve a financial transaction.

In response to its financial crisis, USPS took a number of actions that attempted to balance its operating costs with its lower revenues, including making changes to its operations and network. For example:

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[9]In addition to revenue from post offices, total retail revenue includes revenue from alternate access channels, such as usps.com; self-service kiosks; non-USPS-operated postal facilities, such as Contract Postal Units; and USPS approved shippers and stamp retailers.

GAO-16-811 U.S. Postal Service

- From 2009 to 2013, USPS decreased the size of its workforce as well as overall work hours through retirements, attrition, and initiatives to streamline its operations.

- In 2012 and 2013, USPS consolidated 141 mail-processing facilities and reduced mail-processing work hours by over 6 million in 2013.

- USPS reduced or modified retail hours in thousands of mostly small, rural post offices as part of its Post Office Structure Plan (POStPlan).[10] USPS has also expanded its partnerships with retailers in an effort to provide greater access to its products and services while reducing costs.[11]

- USPS changed its standards by increasing the number of days for some mail to be delivered and still be considered on time.[12]

These changes have led to concerns that rural areas are facing degraded delivery service performance. USPS is now collecting data to examine rural delivery service performance.

Internet Trends

Overall, Internet access and use has grown nationwide, and a large majority of Americans now have access to broadband. According to the Pew Research Center, use of broadband has grown from less than 10 percent of adults in 2000 to about 67 percent in 2015.[13] However, FCC has concluded that advanced telecommunications capability is not being

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[10]See GAO, *U.S. Postal Service: Post Office Changes Suggest Cost Savings, but Improved Guidance, Data, and Analysis Can Inform Future Savings Efforts*, GAO-16-385 (Washington, D.C.: April 29, 2016).

[11]See GAO, *U.S. Postal Service: Action Needed to Maximize Cost-Saving Potential of Alternatives to Post Offices*, GAO-12-100 (Washington, D.C.: Nov. 17, 2011); GAO, *U.S. Postal Service: Challenges Related to Restructuring the Postal Service's Retail Network*, GAO-12-433 (Washington, D.C.: April 17, 2012.

[12]See GAO, *U.S. Postal Service: Actions Needed to Make Delivery Performance Information More Complete, Useful, and Transparent,* GAO-15-756 (Washington, D.C., Sept. 30, 2015); GAO, *U.S. Postal Service: Information on Recent Changes to Delivery Standards, Operations, and Performance*, GAO-14-828R (Washington, D.C.: Sept. 25, 2014).

[13]No definition of broadband was provided with this information.

deployed to all Americans in a reasonable and timely fashion.[14] In particular, many Americans still lack access to advanced telecommunications capability, especially in rural areas and on tribal lands.

The federal government has made efforts to increase access to the Internet across the United States, especially in rural areas. As required by the American Recovery and Reinvestment Act of 2009 (Recovery Act),[15] FCC released the National Broadband Plan in 2010 to improve access to, and the services provided by, broadband.[16] To extend access to broadband as well as to stimulate the economy, Congress also appropriated $7.2 billion for broadband programs in the Recovery Act. This funding included $2.5 billion for USDA's Broadband Initiatives Program (BIP), which provided financing for broadband infrastructure projects in rural areas. By 2010, USDA had awarded BIP funding to nearly 300 projects.[17]

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[14]See FCC, *2016 Broadband Progress Report* (January 2016). "Advanced telecommunications capability" is a statutory term with a definition that differs from the term "broadband" as it is used in other contexts. See 47 U.S.C. § 1302(d)(1). However, FCC considers the availability of various broadband services that contribute to advanced telecommunications capability in its analysis. FCC's current speed benchmark for advanced telecommunications capability is 25 megabytes per second (Mbps) download and 3 Mbps upload for fixed services.

[15]Pub. L. No. 111-5, § 6001(k)(1), 123 Stat. 115, 515-516 (2009).

[16]FCC, *Connecting America: The National Broadband Plan* (March 2010).

[17]See GAO, *Recovery Act: USDA Should Include Broadband Program's Impact in Annual Performance Reports,* GAO-14-511 (Washington, D.C.: June 2014).

Broadband Use Is Associated with Lower Use of First-Class Mail, Though Less So in Rural Areas; Extent of Future Decreases in All Areas Is Unclear

Broadband Use Is Associated with Reduced Use of Some First-Class Mail but Continued Mail Volume Declines Are Uncertain

Broadband access to various Internet services, especially online bill paying, has in recent years been associated with reduced of use transaction mail, a subset of First-Class Mail.[18] Our analysis of USPS's HDS data from 2007 to 2014 found a negative relationship between broadband use and the volume of transaction mail sent, after adjusting for available demographic and other factors that might be associated with the use of postal services.[19] In other words, controlling for age, income, and education, households that used broadband to access Internet services tended to send less transaction mail than other households. Our analysis of the HDS data also found that households using broadband were specifically more likely to pay bills online. Further, other analysis we performed in one of our case study areas suggests that broadband availability was associated with greater likelihood of online bill payment.[20] Specifically, we found that the more broadband providers available to customers of a specific regional bank in Louisiana, the more likely these

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[18]Transaction mail includes bills, statements, payments, donations, rebates, and orders.

[19]Since 2007, the HDS has asked participants about "the primary type of Internet connection used by the adults in your home." When reporting results of our HDS analysis we use the term "broadband use" to refer to those households that reported using high-speed services—including digital subscriber line (DSL), cable modems, and fiber optic—as their primary connections to the Internet.
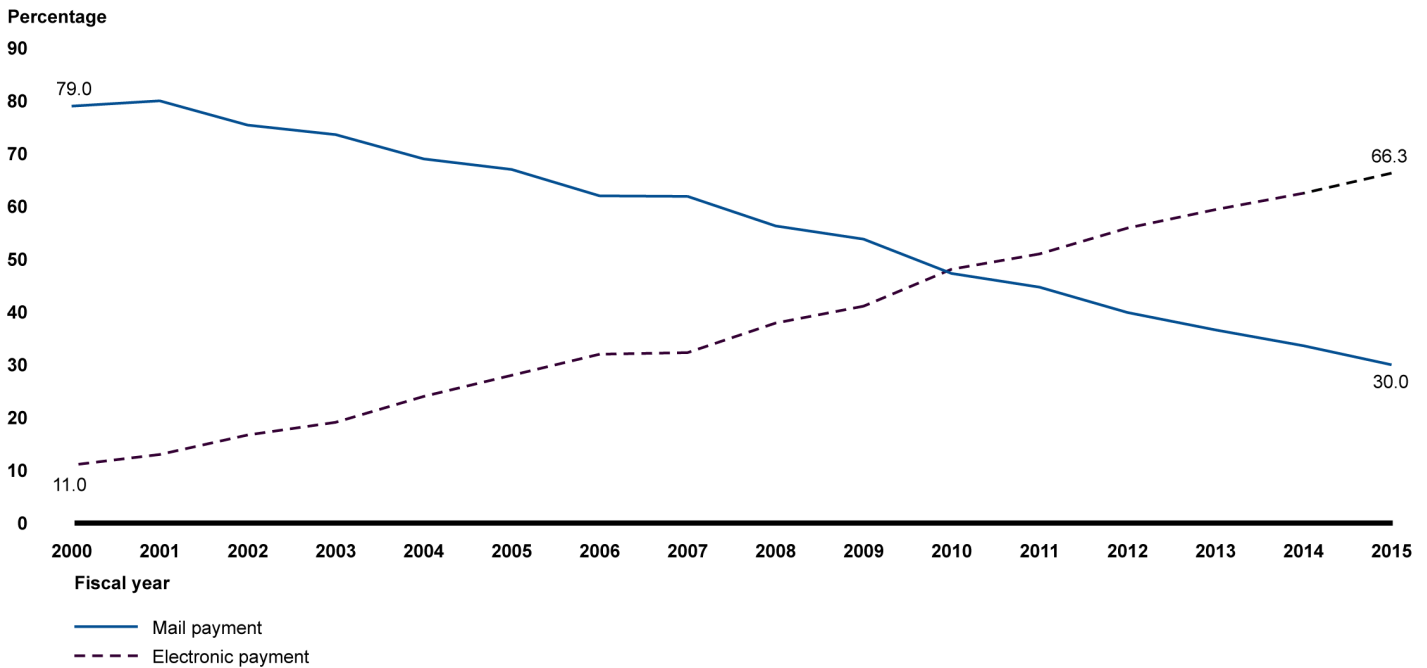
[20]We analyzed data from 2010 through 2015 on customers eligible for online bill paying services from a regional bank with operations in Louisiana and broadband provider data collected by the National Telecommunications and Information Administration's State Broadband Initiative and FCC. In this analysis, broadband providers were those offering fixed Internet access connections over 3 Mbps download and 1 Mbps upload.

customers were to pay certain bills online. These findings are consistent with other research that has shown First-Class Mail volume to be negatively affected by availability of the Internet.[21] Further, these findings align with evidence that while some customers still prefer to receive paper statements through the mail, an increasing percentage now pay their bills electronically.[22] Our summary of HDS data on how households pay their bills also illustrates this trend (see fig. 3). All 11 of the experts we spoke with agreed that individuals with broadband are more likely to engage in online activities that replace transaction mail use, such as online bill paying. One of the experts we spoke with noted that in contrast to correspondence mail, discussed below, bill payments are financial transactions and therefore more easily influenced by matters of cost and convenience. Two other experts we spoke with noted that some businesses have encouraged customers—often through financial incentives—to switch to electronic bill payment.

[21]See PRC, Direct Testimony of Thomas E. Thress on behalf of the United States Postal Service, Docket Number R2006-1.

[22]See Susan Herbst-Murphy, *Trends and preferences in consumer payments: Updates from the visa payment panel study*. Federal Reserve Bank of Philadelphia-Payment Cards Center Discussion Paper, 2015; and USPS OIG. *Will the Check Be in the Mail? An Examination of Paper and Electronic Transactional Mail*. RARC-WP-15-006. 2015.

Figure 3: Share of Bill Payments by Method, Fiscal Years 2000—2015

Percentage

Source: GAO summary of U.S. Postal Service Household Diary Survey data. | GAO-16-811

Note: Bills paid in person are not shown.

Correspondence mail, another subset of First-Class Mail, has been in decline for over a decade, but we found that broadband use may not have had a significant effect on that trend in recent years.[23] Specifically, our analysis of USPS HDS data found no statistically significant relationship between use of broadband and correspondence mail, after adjusting for demographic and other factors that might be associated with the use of postal services. USPS has reported that some decline in correspondence mail has been due to electronic diversion,[24] but four of the experts, as well as the PRC officials, we spoke with suggested that by now most individuals have changed their behaviors to reflect their Internet use, since many households have had the basic Internet access necessary for electronic communications for years. That is, according to these experts,

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[23]Correspondence mail includes letters, greeting cards, invitations, and announcements.

[24]See USPS, *The Household Diary Study: Mail Use & Attitudes in FY 2014*, May 2015.

a substantial number of individuals now have established preferences for e-mail and other technologies over mail, developed over many years, and their behavior does not continue to change. As one expert we spoke with suggested, the lack of a relationship between broadband and correspondence mail in our analysis could reflect that individual communication choices are no longer significantly influenced by broadband in the home. Two experts we spoke with also noted that correspondence mail has been a relatively small portion of First-Class Mail and has generally been a durable part of the mail stream. Some individuals may continue to send personal cards and invitations as a matter of etiquette and tradition, possibly making this type of mail volume more resistant to electronic diversion.

Although USPS's First-Class Mail volume, including both correspondence and transaction mail, has declined substantially since 2000, it is unclear to what extent broadband use will lead to further declines. Several studies have found that electronic diversion was a key factor in past mail volume declines.[25] However, although USPS has said that they anticipate that First-Class Mail volume will continue to decline with the migration to electronic alternatives resulting from technological changes, experts we spoke with had mixed views on the future of First-Class Mail and its relationship to broadband use. Only 4 of the 11 experts we spoke with said that First-Class Mail was likely to continue decreasing at least in the short-term. Two of these experts maintained that there may be another large decline in First-Class Mail as broadband access expands and the now younger generations—who have come of age almost entirely using electronic services and technologies for their business and personal interactions—become the dominant portion of the population and economy. One expert suggested that as the Internet continues to evolve, there are likely to be new, unforeseen ways in which postal business will be diverted online. As USPS has explained to PRC, even upon reaching the natural ceiling of Internet use (where theoretically everyone in the United States could have Internet access), electronic diversion of the mail

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[25]See, for instance, Hong, Seung-Hyun, and Frank A. Wolak, "Relative prices and electronic substitution: Changes in household-level demand for postal delivery services from 1986 to 2004, *Journal of Econometrics* 145 (2008). A 2010 study conducted for USPS also predicted further mail volume declines, in part as a result of electronic diversion. See Boston Consulting Group, *Projecting U.S. Mail Volumes to 2020* (March 2010).

could still increase because of an increasing depth of Internet usage (that is, an increasing number of things individuals can accomplish using the Internet).[26] For example, First-Class Mail could erode further if more individuals abandon paper copies of their bills and rely on electronic records exclusively.[27] Four experts, as well as officials from six of the groups we spoke with for our case studies, also suggested that Internet privacy and security concerns could be contributing to a slowed rate of electronic diversion. For example, officials from one group of business officials we met with said that many people in their area see mail as safer than Internet services because of computer hacking and identity theft concerns. According to these officials, cybersecurity concerns remain a barrier to broadband adoption and a source of continued First-Class Mail use.

USPS officials told us they recognized that broadband use is changing the way people use postal services. As a result, USPS has been exploring a variety of initiatives to strengthen the value of First-Class Mail for all business and residential customers. USPS is piloting Informed Delivery, a program which lets customers receive an interactive e-mail each day that shows the faces of the mail pieces they will receive in their mailbox.[28] Further, in an effort to appeal to the tactile satisfaction customers may experience when handling hardcopy mail (e.g., catalogs, advertising postcards) while also leveraging smartphone technologies, USPS has long collaborated with business customers to develop mail that incorporates a variety of paper textures as well as Quick Response codes that allow customers to easily access the business's online presence. Two experts we spoke with, though, suggested that USPS should focus on its main business of mail delivery, rather than digital initiatives and other efforts that may distract the organization from its core competencies. According to the USPS officials we spoke with, USPS must continue to innovate to stay competitive and relevant to its customers. They believed that USPS cannot ignore the changes and opportunities created by broadband and mobile technologies.

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[26]USPS, *Narrative Explanation of Econometric Demand Equations for Market Dominant Products*, submitted to PRC (July 2015).

[27]Indeed, as one expert noted, some businesses have tried to encourage the switch to digital technology by imposing charges for paper records.

[28]Senders can link the image to a website to make these messages interactive.

Broadband Expansion May Affect Rural America's Reliance on First-Class Mail

Overall, households in rural areas have tended to send more correspondence and transaction mail than non-rural households in recent years. Specifically, our analysis of USPS HDS data found that among households without broadband, households in rural areas tended to send more correspondence and more transaction mail than did non-rural households, after adjusting for demographic and other factors that might be associated with the use of postal services. This analysis is generally consistent with the USPS Office of Inspector General's (OIG) findings on First-Class Mail trends. The OIG found that the areas with the lowest declines in mail volume also had the lowest populations.[29] However, when factoring in broadband use, we found that rural households that used broadband tend to resemble non-rural households in the amount of correspondence mail they sent. In other words, after adjusting for demographic and other factors, rural households with broadband Internet access were not statistically different in the volume of correspondence mail sent compared to non-rural households.

The USPS, ISP, and business officials we interviewed for our case studies generally agreed that overall, residents of rural areas value mail and postal services for a variety of reasons. First, they stated that rural residents generally have fewer alternatives to the mail. Officials from 7 of the 14 USPS and business group stakeholders we spoke with noted that customers in rural areas have less access to alternative forms of communication, with both broadband and mobile service generally less reliable. Second, officials stated that rural residents overall tend to be older and therefore less likely on average to adopt new technologies.[30] Officials from 9 of the 19 USPS, ISP, and business group stakeholders we spoke with said that elderly residents generally make up a higher proportion of the population in rural areas and often do not have broadband access or, if they do, are reluctant to convert to online bill payment. Third, we were told in our case study areas that rural residents trust and value USPS services. For instance, three of the five groups of business stakeholders we spoke with in rural areas mentioned that they trust USPS employees and the mail. Internal research by USPS also

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[29]USPS OIG. *Declines in U.S. postal service mail volume vary widely across the United States*. RARC-WP-15-010 (April 2015).

[30]Though evidence suggests that age is associated with postal use, our analysis of HDS data controlled for age and still found a correlation between rural residents and mail use.

suggests that rural customers are generally more satisfied with their USPS experiences than non-rural customers.

Notwithstanding the strong relationship between many rural residents and USPS noted by the USPS, ISP, and business group stakeholders we interviewed, the future of First-Class Mail volume in rural areas is unclear. In the aggregate, rural areas have experienced mail volume declines. For example, the USPS official from one rural post office we spoke with recalled that postal carriers would have numerous trays of colorful envelopes ready to be delivered in the week before Mother's Day, but that in recent years, such letters are rarer. Research suggests that some of this decline has likely been due to electronic diversion and that further declines may occur as broadband access expands to more rural areas. Two groups of business officials we spoke with for our case studies noted that introducing expanded and improved broadband access is likely to increase use of the Internet, resulting in further declines in mail volume. For instance, one business stakeholder we spoke with noted that prior to a fiber broadband project's recent completion, many residents of this rural area only had DSL or satellite services for their Internet, which he said were less reliable. The full effect of such expanded broadband access in our case study areas specifically is unknown at this time, given the recent completion of many of the broadband projects.

E-Commerce Continues to Drive Package and Shipping Business, but USPS Could Face Increased Competition and Challenges in the Package Delivery Market

E-commerce continues to have a strong effect on USPS package volumes. Our analysis of USPS HDS data found a positive relationship between broadband use and packages both sent and received, after adjusting for demographic and other factors that might be associated with the use of postal services. In other words, broadband use in the home was associated with sending and receiving more packages with USPS. These findings align with other research showing growth in package volumes related to e-commerce activities. As we previously reported, the Internet has become an important part of the U.S. economy, particularly in how it facilitates e-commerce.[31] Nine of the experts we spoke with specifically attributed the growth in e-commerce as largely responsible for the association we found between broadband use and package delivery. As one expert described, packages have increased in number dramatically as conducting online transactions became easier, and USPS's large delivery network allows it to benefit from this trend.

We found that households in rural areas made greater use of package and shipping services. Specifically, our analysis of USPS HDS data found that households in rural areas received more packages than did non-rural households, after adjusting for demographic and other factors that might be associated with the use of postal services. The same analysis also found that rural households without broadband tended to receive more packages than non-rural households without broadband. Our analysis also found that, substantively, rural households using broadband tended to resemble non-rural households using broadband in the number of packages they received. In other words, when rural households used broadband, they received packages at rates similar to non-rural households.

The USPS, ISP, and business officials we interviewed for our case studies agreed that rural residents send and receive more packages than their non-rural counterparts. A commonly cited reason for the relatively high use of package delivery services was the lack of retail options in many rural areas. Three of the nine local USPS officials we spoke with specifically noted that e-commerce may be used at a higher rate in rural

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[31]See GAO, *Broadband: Intended Outcomes and Effectiveness of Efforts to Address Adoption Barriers Are Unclear*, GAO-15-473 (Washington, D.C.: June 2, 2015) and GAO, *Telecommunications: USDA Should Evaluate the Performance of the Rural Broadband Loan Program*, GAO-14-471 (Washington, D.C.: May 22, 2014).

areas because of the lack of brick-and-mortar retail options. One USPS official mentioned that there are not many local shopping options in his town, which he said had only a tiny general store, a grocery store, and a Family Dollar store, with the nearest Walmart being 60 miles away. As a result, residents do a lot of online shopping and catalog shopping, with individuals regularly coming to the post office to collect packages. Officials from 7 of the 14 USPS and business group stakeholders we spoke with also attributed some of the recent growth of packages to rural entrepreneurs that ship merchandise sold through websites such as eBay or Etsy.

The growth in USPS's package business is likely to continue in the short term. E-commerce and thus package volumes have been forecasted to grow in the double digits year-over-year for the next few years.[32] Other recent research indicates that while e-commerce continues to grow, it remains a modest share of overall consumer purchase activity, suggesting significant room for growth.[33] Six of the experts we spoke with expected that as a result of overall e-commerce growth, USPS's package and shipping services will likely continue to increase in the short-term.

USPS has opportunities to maintain or enhance its share of the package delivery market. Two experts we spoke with said that USPS is likely to remain the dominant package deliverer in rural areas in the short-term because delivery in low-population-density areas is expensive, but USPS is already obligated to visit most households for mail delivery. USPS has also implemented measures to address the shipping needs of rural customers specifically. For instance, USPS created a new job category for rural carriers that will enable them to provide package delivery service on Sundays and holidays.[34] Also, USPS is purchasing new vehicles that will accommodate projected package volumes. Under a pilot program in some cities, USPS is offering access to lockers in convenient locations

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[32]See eMarketer, *Worldwide Retail Ecommerce Sales: eMarketer's Updated Estimates and Forecast Through 2019* (2015).

[33]See Herbst-Murphy, 2015.

[34]The National Rural Letter Carriers' Association and USPS recently agreed to establish a new, non-career leave replacement employee classification of assistant rural carrier. This new position may only perform Saturday, Sunday, and holiday duties and will be paid on an hourly basis. The new position will also have limited contractual benefits.

that customers can use to receive or ship packages. USPS has also designed new mailboxes that can fit most packages weighing up to 5 pounds, which will enable carriers to deliver more packages directly to the mailbox, rather than having to leave their vehicle or leave a notice requiring the customer to retrieve the parcel at the Post Office.

Regardless of any short-term gains in the package delivery market, USPS is likely to face challenges in the longer term. Six of the experts we spoke with suggested that it could be difficult for USPS to maintain large increases in package volumes since they are likely to face increased competition in the package delivery business. The online retailer Amazon, for instance, is developing its own delivery network that could eliminate large package volumes from USPS. One expert also noted that as USPS's package business continues to increase, it could necessitate the development of additional routes, as well as the purchase of more trucks, to deliver packages. Additional routes beyond those necessary for daily mail delivery are more expensive to operate and thus could undercut any profits USPS would make from increased package volumes. This could be particularly challenging in rural areas where package deliveries are more expensive, as it may necessitate surcharges on package delivery in those areas. Furthermore, should the demand for USPS delivery of packages later decrease, USPS could find itself with an expensive, underutilized delivery-related infrastructure to maintain. Another expert also suggested that any shift in priority by USPS to package delivery could degrade the core business of delivering mail, leading to possible service declines for First-Class Mail and periodicals.

Overall Effect of Broadband Use on Post Office Visits Is Unclear, though Data Is Limited; Rural Residents Value the Presence and Services Provided by USPS

While access to Internet services has had a major effect on other postal services, as described above, it is unclear what role the Internet has played in the nationwide reduction in post office visits in recent years. Our analysis of USPS's HDS data found no statistically significant relationship between broadband use and post office visits.[35] Our analysis of USPS's retail facilities and FCC's broadband subscriber data also did not demonstrate a clear connection between USPS retail availability and broadband use.[36] Further, revenue data from the post offices in our case study areas show no consistent trends; some offices generated more revenue after the broadband project was completed, while others generated less revenue. One expert we spoke with suggested that these findings could be the result of off-setting trends, with some customers using post offices more frequently to pick up packages, while some customers are buying fewer stamps at the post office. Another expert said that broadband use may be unrelated to post office use because people have settled into new postal retail behaviors. That is, whether they use broadband to access the Internet could no longer be a significant factor in whether individuals choose to visit post offices. The PRC officials we spoke with also noted that not all postal transactions can be done online. For instance, purchasing money orders must be done in person at a USPS retail facility.

With regard to rural households, however, we found that rural households tended to visit post offices more than non-rural households, independent of broadband use. Our analysis of the USPS HDS found that households in rural areas tended to make more post office visits than did non-rural households, after adjusting for demographic and other factors that might

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[35]Post office visits may not result in a financial transaction if, for example, an individual is just picking up or dropping off mail. The HDS data do not contain information about individual household post office transactions or revenue.

[36]This analysis showed that counties with more broadband subscribers (in relation to the total number of households) had, on average, more USPS retail facility availability, as measured by the average total hours open of all retail facilities in the county. However, the analysis showed that counties with relatively more broadband subscribers had, on average, less USPS retail facility availability per capita. This is in line with the notion that residents of urban and suburban areas are more likely to subscribe to broadband, and that those areas also generally have more USPS retail facilities but fewer open hours per capita because of the relatively higher population levels, but does not establish any connection between broadband and USPS retail availability. In these data, broadband subscribers were residential units with fixed Internet access connections over 3 Mbps download and 768 kilobits per second upload.

be associated with use of postal services. That is, our analysis suggests that rural households used local post offices at a higher rate than non-rural households. However, this information is limited because it does not capture the nature of the post office visits. Indeed, a possible explanation for the relationship we found is that some rural households are required to pick up their mail at the local post office because they are not eligible for home delivery.[37]

Rural residents may rely on post offices more than non-rural customers because, as noted previously, fewer retail options exist for them. Officials from 12 of the 19 USPS, ISP, and business group stakeholders we spoke with maintained that post offices provide services that are not available anywhere else in their communities. The PRC officials we spoke with also said that the lack of retail options could explain an increased reliance on USPS services. For instance, officials from eight post offices we spoke with said that some residents use post offices frequently for money orders, sometimes because they do not have bank accounts or because there are no banks in their rural communities. Although money orders are among USPS's more profitable products, the number of domestic money orders sold has plunged 60 percent since their peak in fiscal year 2000, largely as the result of alternatives from other providers and broad shifts toward electronic payments.

Rural residents may also use USPS services and post offices at higher rates because of the special role of USPS in rural communities. Officials from 12 of the 19 USPS, ISP, and business group stakeholders we interviewed for our case studies in rural areas agreed that post offices are valuable to the economic and social life of their communities. Seven of the 11 experts we spoke with believed that rural customers may have a different relationship with USPS than other customers. According to one expert, the post office is "disproportionately important" in rural areas while another expert noted that rural post offices provide a sense of community. Four of the nine local USPS officials we interviewed said that in very small communities where most of the residents know one another, the post office serves as one of the few places where residents see each other and talk. As a result, post offices serve as a valuable social space in

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[37]USPS exempted itself from providing carrier delivery service to customers who reside within a quarter-mile of non-city delivery post offices.

GAO-16-811 U.S. Postal Service

these small communities, where even the bulletin board can be a valuable communication tool. The USPS OIG also recently stated that in rural areas the post office is not just a place to pick up mail, buy stamps, or mail a package, but can also serve as a community gathering place.[38] Six local USPS officials also listed examples of when postal employees went above and beyond their typical duties to help fellow citizens of their rural communities. For instance, according to the USPS officials, staff commonly help illiterate, disabled, or non-English speaking customers complete forms.

In addition to what we heard from our case study and expert interviews, research we identified through our literature review noted that USPS retail outlets have long played an important role in the health of rural communities for several reasons. Many rural areas, due to their remote locations and often limited retail options, face systemic disadvantages impeding their full and robust participation in the global economy. In these areas, USPS prices can establish a competitive baseline for other delivery services. USPS also ensures that anyone—including isolated or disadvantaged consumers—can access products from anywhere. Researchers have also reported, as discussed above, that in addition to the practical effects, post offices may serve an important symbolic and social role in rural areas.[39] The mail carrier is a source of social contact for isolated populations and may be a rural resident's only daily contact. Furthermore, USPS also cooperates with other government agencies for their mutual benefit. For example, state wildlife departments have used rural mail carriers to track populations of small game.

To balance the benefits of its retail network with the high costs and decreasing revenue generated by those retail facilities, USPS is undertaking various initiatives. USPS officials we spoke with noted the real value of the local post office to rural customers. Officials said that POStPlan was implemented in a way that sought to minimize the impact on rural communities, such as keeping many post offices open but with more limited hours of service. USPS has also made the purchase of

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[38]USPS OIG, *Retail Opportunities for the U.S. Postal Service*, MS-WP-15-004 (2015).

[39]For example, according to a study conducted for the PRC, researchers report that post offices can establish a community identity, especially in rural areas. See Urban Institute, *A Framework for Considering the Social Value of Postal Services* (Feb. 2, 2010).

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stamps easier for rural customers by selling stamps in grocery stores or pharmacies. Finally, rural carriers serve as a "Post Office on Wheels" and can both sell stamps and pick up packages for customers in very remote areas. USPS is also developing mobile technology applications that will allow customers to perform more services at retail USPS locations without interacting with USPS personnel, such as printing shipping labels.

Irrespective of these efforts, balancing the benefits of a robust retail network with the costs of maintaining that network, especially in rural areas, will continue to be challenging for USPS. Research has indicated that though delivery of mail may be more expensive per piece in rural areas than in urban areas, a variety of benefits accrue to USPS for maintaining the network to deliver the mail in rural areas. Despite these and the more intangible benefits described above, research has also indicated that USPS's retail network may not be structured efficiently. Prior to USPS's recent retail changes as part of POStPlan, analysis prepared by USPS OIG suggested that USPS's network had too many retail facilities located too closely together and with too many retail windows relative to the local population, though rural customers on average must travel farther to reach a postal facility than in urban areas.[40] Another study of the distribution of USPS retail facilities found that the distribution of another valuable retail business, pharmacies, followed the distribution of population much more closely than did the distribution of postal retail outlets.[41] Further, our analysis of USPS retail facilities data shows that USPS has more facility open hours per capita in rural areas than in nonrural areas. The postal retail network, though, is different from one based on market forces largely because of USPS's universal service obligation, part of which requires it to provide access to retail services.

Agency Comments and Our Evaluation

We provided a draft of this report to FCC, PRC, and USPS for review and comment. FCC provided technical comments, which we incorporated as appropriate. PRC also provided technical comments, including requests for more information about our methodologies in the final report, which we

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[40]USPS OIG, *Analyzing the Postal Service's Retail Network Using an Objective Modeling Approach*, RARC-WP-10-004 (2010).

[41]Cohen et al, *The Conflict About Preserving Small Rural Post Offices: Difference in the Distribution of Pharmacies and Post Offices* (November 2006).

incorporated as appropriate. USPS did not have any comments on the draft report.

As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the appropriate congressional committees, the Postmaster General, the Acting Chairman of the PRC, the USPS Office of Inspector General, the Chairman of the FCC, and other interested parties. In addition, the report will be available at no charge on the GAO website at http://www.gao.gov.

If you or your staff have any questions about this report, please contact me at 202-512-2834 or rectanusl@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff making key contributions to this report are listed in appendix II.

Lori Rectanus
Director
Physical Infrastructure Issues

Appendix I: Objectives, Scope, and Methodology

This report assess the relationship between the use of broadband and the use of the U.S. Postal Service's (USPS) (1) mail services, (2) package and shipping services, and (3) post offices, particularly in rural areas. For the purposes of all our data analysis in this report, we defined "rural" as areas identified as rural by the U.S. Department of Agriculture (USDA) Economic Research Service's Rural-Urban Commuting Area Codes (RUCA). The 2013 RUCA data (the most recent available) incorporates Census tract commuting patterns and other measures of "rurality" in addition to population density. RUCA has 10 tiers along a spectrum of rurality, each of which is further broken down into secondary codes. We used the 4-tiered data consolidation, which collapses the 10 RUCA tiers into 4, where the bottom 2 tiers are considered rural.

Background

For background and context for this report, we examined our recent reports on USPS as well as the USPS Office of Inspector General's reports on mail volume changes and USPS changes to its operations and network. We also examined USPS's Revenue, Pieces & Weight reports from fiscal year 2001 to 2015 for information on mail volumes. Further, we reviewed recent Federal Communications Commission (FCC) and Pew Research Center reports on broadband trends.

Literature Review

To assess the relationship between broadband use and overall use of postal services, we first identified factors associated with postal and broadband use through a review of academic and government literature. We also used our literature review to identify research on the role of post offices in rural America. To identify articles for our literature review, we searched databases such as Academic OneFile, National Technical Information Service, PolicyFile, ProQuest Research Library, Scopus, and WorldCat. Searches were limited to documents from 2010 and later. After conducting preliminary searches in these databases, two analysts separately reviewed the search results to identify the most relevant articles, with a third analyst resolving the differences. After this review, if an article cited another article or was cited by an article that seemed relevant to our audit, we included those articles in our literature review. With our full list of articles, an analyst reviewed each article for its key findings regarding factors associated with postal and broadband use. All of these key findings were then summarized by an analyst, with the conclusions used to inform our data analysis. We also identified other studies cited in this report through our interviews with various stakeholders. All articles cited in this report were also subjected to an

internal review to ensure that the methodology was sufficient for our
purposes and that we characterized its findings appropriately.

Household Diary Survey Analysis

To assess the relationship between broadband use and the use of postal
services, as well as how use of postal products differs in urban and rural
areas, we conducted regression analyses using data from the USPS's
Household Diary Survey (HDS). Conducted annually, the HDS obtains
information from a nationally representative sample of over 5,200
households to provide a comprehensive and continuous description of the
mail originating and destinating in American households. Our analysis
used HDS data collected from 2007 to 2014 because data were collected
for all our variables of interest for these years and because 2014 was the
most recent year for which data were available for our analysis.[1] The data
were not available, and it was not our purpose, to assess the relationship
between broadband use and the use of postal services in the early years
of broadband, that is prior to 2007. For our analysis, we created a pooled
dataset that included household-level data collected as part of the HDS
from 2007 to 2014, and we used weights, calculated by USPS, designed
to ensure that each yearly sample was representative of households
nationwide.

We used negative binomial regression analysis to model the HDS data.
Negative binomial regression models are a type of count model that allow
for overdispersion in zero counts in the dependent variable, which was
appropriate given that not all households used all postal services we
examined. Based on the findings from the literature review described
above, we included independent variables for age, education, and
income, because those factors have been found to be associated with
use of both postal and broadband services.[2] We also included
independent variables for household location, to assess whether the

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[1]Some households included in the HDS data had zero mail pieces sent or received
associated with them. The data did not allow us to determine whether a sampled
household with zero mail pieces simply failed to fill out the HDS diary or actually had no
mail. We ran regression models with these households and without and our results were
not substantially affected by this decision.

[2]Our regression analysis did find that age, education, and income all had a statistically
significant relationship with postal use.

rurality of a household affects postal use,[3] and both the Census region and year, to control for any other regional or time effects.[4] To examine the effect of Internet use on postal use, we included an independent variable for broadband access.[5] We did not have complete information on all factors that might relate to volume of mail sent or received, such as proximity to a post office or the reliability or speed of a household's broadband connection. Accordingly, our model omits some factors that may also influence the volume of mail households send and receive. Our dependent variables—the aspects of postal and broadband use we examined—were the volume of:

- visits to the post office;

- correspondence mail sent;[6]

- transaction mail sent;[7]

- standard mail received;

- packages sent;

- packages received;

- periodicals received; and

- bills paid online.

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[3]To test for differences in how broadband use might be related to postal use between rural and non-rural households, we also included interaction terms between the household location variable and broadband use.

[4]We pooled multiple years of the HDS survey together and estimated a single model, rather than analyzing each year of the HDS separately because this created a larger sample size that better enabled us to detect any effects of broadband use on postal use. This approach assumes that the relationship between broadband and postal usage is constant over time, which during this limited time frame we have no reason to suspect otherwise.

[5]Since 2007, the HDS has asked participants about "the primary type of Internet connection used by the adults in your home." When describing results of this HDS analysis we used the term "broadband use" to refer to those households that reported using high-speed services—including DSL, cable modems, and fiber optic—as their primary connections to the Internet.

[6]Correspondence mail includes letters, greeting cards, invitations, and announcements.

[7]Transaction mail includes bills, statements, payments, donations, rebates, and orders.

We considered coefficient estimates statistically significant if they were significant at a level of 0.05 or less.[8] For interaction coefficients that considered the joint effect of rural status and broadband access, we used an adjusted Wald F statistic to assess statistical significance. Because our primary goal was to assess the existence and direction of any relationship between broadband access and our dependent variables, and because of substantial variation in the distribution of counts across our different dependent variables, we focused our discussion on the direction and statistical significance of the estimated coefficients for broadband, rural status, and their interaction, rather than their individual magnitude.

To ensure the accuracy of our data analysis, and reliability of the HDS data, we conducted various tasks. To verify that we understood the HDS data provided to us, and were able to correctly apply the weights that make the data nationally representative, we re-created select statistics reported by USPS in its 2014 HDS report. The statistics were selected to represent data from all of the USPS product types of interest to our model (i.e., First-Class Mail, Packages, and Post Office visits, as well as a selection of other product types). To assess the HDS data reliability, we interviewed USPS officials and reviewed documentation about the design of the survey and the methods by which survey data were collected and processed. Based on this information, we concluded that the HDS data were reliable for the purpose of conducting a regression analysis of broadband use and postal use while accounting for household location (rural versus non-rural) and other variables of interest.

Other Data Analysis

To assess the relationship between broadband availability and online bill paying, we analyzed data provided by a regional bank with operations in Louisiana and data on broadband providers in that same state. More specifically, we analyzed data from 2010 to 2015 on customers eligible for online bill-paying services from a regional bank in one of our case study areas—described further below—and broadband provider data collected

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[8]This value indicates that there is a less than 5 percent chance of obtaining a result equal to or more extreme than what was actually observed if no relationship between the variables existed.

by the National Broadband Map and FCC's Form 477.[9] Using these data, we created a zip-code-level dataset. With this dataset, we calculated the percentage of customers paying their bills online, among those eligible, for each month over our time period. We also calculated percentages of customers paying their bills online for categories of customers with different numbers of broadband providers (that is, those areas with 1, 2-3, 4-5, or more than 5 broadband providers available at that time).[10] We also calculated percentages for the rural and urban zip codes specifically.

Based on interviews with officials from FCC and the regional bank, as well as review of documentation associated with the broadband data, we concluded that these data were reliable for the limited purpose of creating summary statistics of broadband availability and customer online bill-paying trends. However, we acknowledge that the broadband data collected as part of the National Broadband Map and FCC's Form 477 overstate broadband availability in some areas by counting entire Census blocks as served by providers who serve any portion of that block. Though there were over 11 million Census blocks in the United States for the 2010 Census, this limitation could be problematic in rural areas with relatively large Census blocks. We therefore are not reporting the results of this analysis for rural areas specifically. Nevertheless, the National Broadband Map and FCC data represent the best snapshot of broadband availability as of the time of the data's collection. Further, GAO used the National Broadband Map data for other analysis in 2014.[11] At that time,

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[9]The National Broadband Map is a searchable and interactive website that allows users to view broadband availability across every neighborhood in the United States. It is also a set of publicly available datasets on broadband availability. First published in February 2011, the National Broadband Map was updated every 6 months through April 2015 with data from the State Broadband Initiative. The National Broadband Map was created by the National Telecommunications and Information Administration, in collaboration with FCC, and in partnership with 50 states, 5 territories, and the District of Columbia. Broadband deployment data are now collected biannually from service providers by FCC through the Form 477 Data Program.

[10]In this analysis, broadband providers were those offering fixed Internet access connections over 3 Mbps download and 1 Mbps upload.

[11]See GAO, *Telecommunications: USDA Should Evaluate the Performance of the Rural Broadband Loan Program*, GAO-14-471 (Washington, D.C.: May 22, 2014). We also examined the accuracy of this broadband data in another recent report: GAO, *Telecommunications: Additional Coordination and Performance Measurement Needed for High-Speed Internet Access Programs on Tribal Lands*, GAO-16-22 (Washington, D.C.: Jan. 29, 2016).

we assessed the reliability of the National Broadband Map data by
reviewing how the map developers collected data and conducted quality
assurance checks, as well as through interviews with stakeholders.
Based on this information, and knowing the limitation described above,
we determined that these data were sufficiently reliable for our reporting
purposes.

To assess the relationship between postal service availability and
broadband use, we analyzed broadband subscriber data and information
from USPS's Facilities Database. More specifically, we analyzed data on
the location and hours of service for USPS retail facilities[12] as of January
2016 as well as broadband subscriber data collected by FCC's Form 477.
Using these data, we created a county-level dataset. With this dataset,
we calculated the average hours of USPS retail availability for areas with
different levels of broadband subscribers.[13] In each county, we also
calculated the average hours of USPS retail availability per capita, across
counties with different levels of broadband subscribers. Based on
interviews with USPS officials, we concluded that the Facilities Database
was reliable for the purpose of conducting an analysis with broadband
use. Based on interviews with FCC officials and review of documentation,
we also concluded that the broadband subscriber data were reliable for
the purpose of conducting analysis with USPS retail availability.

Expert Interviews

To discuss interpretations of our data analyses and to better understand
the implications of our findings for USPS, we conducted semi-structured
interviews with 11 postal experts (see table 1 below). We selected
individuals and entities intended to represent a variety of backgrounds—
including mailers, researchers, consultants, and a consumer advocate—

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[12]The dataset provided to us by USPS included all Post Offices, Village Post Offices, and
Contract Postal Units. For this analysis, we excluded all facilities in which the data
indicated that it did not offer "Postal Products and Services."

[13]In this analysis, broadband subscribers were residential units with fixed Internet access
connections over 3 Mbps download and 768 kilobits per second upload.

and based on their roles as experts in previous GAO reports[14] and participation in recent postal conferences.[15] We also discussed our findings with officials from USPS and the Postal Regulatory Commission (PRC). To assess the responses provided in these interviews, an analyst examined each interview summary for specific themes, and a second analyst reviewed the work for accuracy and completeness.

Table 1: Experts Interviewed

- Robert Atkinson, Founder and President, Information Technology and Innovation Foundation
- Jody Berenblatt, Senior Advisor, GrayHair Advisors
- Michael Bradley, Professor of Economics, George Washington University
- Shea Felix, Senior Global Product Marketing Manager, Stamps.com
- James Gattuso, Senior Research Fellow, Heritage Foundation
- Victor Glass, Professor of Professional Practice and Director of the Center for Research in Regulated Industries, Rutgers University
- Richard John, Professor of History and Communications, Columbia University
- Jessica Lowrance, President Elect, Association of Postal Commerce
- Tonda Rush, Director of Public Policy, National Newspaper Association
- Art Sackler, Executive Director, National Postal Policy Council
- Don Soifer, Executive Director, Consumer Postal Council

Source: GAO. I GAO-16-811

Case Study Interviews and Analysis

To better understand use of Internet and postal services in rural areas and expand on the findings of our data analysis, we identified five case study areas that had recently received broadband access through receipt of broadband infrastructure loans or grants from USDA, met our definition

[14]We consulted the following reports on postal issues: GAO-12-100; GAO, *U.S. Postal Service: Mail-Related Recycling Initiatives and Possible Opportunities for Improvement*, GAO-08-599 (Washington, D.C.: June 3, 2008); GAO, *U.S. Postal Service: Opportunities to Increase Revenue Exist with Competitive Products; Reviewing Long-Term Results Could Better Inform Promotions Decisions*, GAO-13-578 (Washington, D.C.: June 25, 2013); GAO, *U.S. Postal Service: Delivery Mode Conversions Could Yield Large Savings, but More Current Data Are Needed*, GAO-14-444 (Washington, D.C.: May 12, 2014); and GAO, *U.S. Postal Service: Status of Workforce Reductions and Related Planning Efforts*, GAO-15-43 (Washington, D.C.: Nov. 13, 2014).

[15]Including the 2016 PostalVision 2020/6.0, 2016 National Postal Forum, 2015 Brookings Institution event "The future of the United States Postal Service," and the 2012 forum "Future of the Post Office."

of rural, and were geographically diverse. More specifically, we obtained a list of Broadband Initiatives Program (BIP) projects—including their completion date, service area, and broadband speeds offered—from USDA's Rural Utilities Service.[16] To identify areas that recently gained improved broadband access, we identified those BIP projects completed between January 2015 and September 2015. To assess whether the service areas of these projects met our definition of rural, discussed above, we analyzed the shape files of the service areas using RUCA code data to identify those with areas that were entirely rural. From these remaining projects, we selected five projects to obtain a range of geographic locations. These five projects were in northeast Louisiana, northern Missouri, northern New Mexico, western North Dakota, and western Virginia. Finally, we selected two of these areas to visit in person (Missouri and Virginia), based on resource and logistical considerations.

For each of these case study areas, we interviewed officials with local USPS facilities, economic development entities and businesses, and Internet service providers (ISP) about the relationship between broadband use and use of postal services. In total, we interviewed officials at nine USPS post offices (see table below) and five ISPs, and conducted five meetings where we brought together economic development and business officials from our case study areas. To assess the responses provided in these interviews, an analyst examined each interview summary for specific themes, and a second analyst reviewed the work for accuracy and completeness. While findings from our case studies cannot be generalized to all rural areas, they provide illustrative examples of the relationship between broadband and postal services, as well as perspectives from residents and businesses in rural areas.

Table 2: Locations of Local Post Office Interviews

- Bonita, Louisiana
- Browning, Missouri[a]
- Meadville, Missouri[a]
- Milan, Missouri[a]
- Mora, New Mexico

[16]BIP was created to provide financing for broadband infrastructure projects in rural areas with limited broadband availability.

- New Town, North Dakota
- Covington, Virginia[a]
- Iron Gate, Virginia[a]
- Low Moor, Virginia[a]

Source: GAO. I GAO-16-811

[a]Interviews conducted in person at the post office.

To further understand how, if at all, the recent broadband projects affected postal use in our case study areas, we analyzed USPS's post office revenue data. More specifically, we calculated the total revenue generated at nine post offices in our case study areas for the same 6-month periods before and after completion of the broadband project. We were not able to conduct more detailed analysis of revenue trends because of lack of equivalent data at all post offices, since different post offices have used different revenue and transaction-tracking systems, and other limitations. Based on interviews with USPS officials, we concluded that the USPS revenue data were reliable for the purpose of examining trends over time at selected post offices.

We conducted this performance audit from October 2015 to September 2016 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: GAO Contact and Staff Acknowledgments

GAO Contact

Lori Rectanus, (202) 512-2834 or rectanusl@gao.gov

Staff Acknowledgments

In addition to the individual named above, key contributors to this report were Mark Goldstein (Director); Teresa Anderson (Assistant Director); Faye Morrison (Assistant Director); Kyle Browning; Stephen Brown; Russ Burnett; Caitlin Cusati; Leia Dickerson; Sharon Dyer; Bill Egar; Georgeann Higgins; Kenneth John; John Mingus; Anna Maria Ortiz; Cheryl Peterson; and Michelle Weathers.