Digital Equity

Leveraging Postal Infrastructure for Digital Equity

Design Center: From Postal Networks to Community Places
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Introduction

Toby Greenwalt, Director of Digital Strategy and Technology Integration at the Carnegie Library of Pittsburgh, thinks of digital equity as a three-legged stool: "People need speedy Internet connections, they need hardware, and they need training," he said in an interview for this project. "You need all three together."[1] Without one leg, the stool would fall apart.

Our project team within the "From Postal Networks to Community Places" class at Carnegie Mellon University has been focusing particularly on one leg of that stool: access to broadband. We see it as a catalyst to social connection, economic development, and upward mobility. Broadband should be inclusive. But the reality is, over 24 million Americans lack fixed terrestrial broadband at speeds of 25 Mbps/3 Mbps, according to the FCC's 2018 Broadband Deployment Report.[2]

Digital equity has emerged as a priority for the United States. The FCC recently created a $120 billion Rural Digital Opportunity Fund to support high-speed Internet initiatives for up to four million homes and small businesses.[3] Furthermore, the Senate has introduced the Digital Equity Act of 2019 to create an annual $125 million formula grant program that would support creating digital equity plans in all 50 states, Washington, D.C., and Puerto Rico.[4] Yet there is still a missing piece of the digital equity puzzle: at-scale facilitation to support the digital last mile.

Our team sees an opportunity for the United States Postal Service to utilize its own infrastructure to help bridge the country's broadband divide. We propose that the USPS becomes a broker of broadband connectivity to maintain its mission of connecting people across the US with each other based on its trusted reputation within communities and its Universal Service Obligation. This whitepaper will outline this new systems approach, the value of our proposal, background research, and a brief overview of the business case for this proposal. We are a team of designers who are trying our best to carry forward business and policy value. We bring a lens of systems- and human-centered design to our concept.

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1. Greenwalt, Toby. Personal Interview. April 2019.

2. FCC. 2018 Broadband Deployment Report. 2 February 2018. https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2018-broadband-deployment-report

3. Maggi, Laura. "FCC Creates $20 Billion Rural Broadband Fund." Nextgov. 15 April 2019. https://www.nextgov.com/emerging-tech/2019/04/fcc-creates-20-billion-rural-broadband-fund/156307/

4. Quaintance, Zack. "What's New in Civic Tech: U.S. Senate Tackles Digital Equity." Nextgov. 15 April 2019. https://www.nextgov.com/emerging-tech/2019/04/fcc-creates-20-billion-rural-broadband-fund/156307/

Problem

At the beginning of the semester, our team met at Everyday Cafe to do some brainstorming. Located on the outskirts of the Pittsburgh, Pennsylvania neighborhood of Homewood, Everyday Cafe opened in 2016 as a coffee shop and community center. According to an article on Next Pittsburgh, Everyday Cafe was "filling a void" as a gathering space with free Wi-Fi[5]. Customers could only pay with card or online systems like Apple Pay. Everyday Cafe does not accept cash. As a result, we learned that for some residents, the space is not ideal. We met a Homewood resident who was working at a table with her friend because it was a place to access Internet before the Homewood branch of the Carnegie Library of Pittsburgh opened. She felt Everyday Cafe was not welcoming to those who only carry cash. Yet there were no other open neighborhood spaces with Internet in the early Saturday morning.

While Everyday Cafe has good intentions in creating a community space, its decision to not accept cash payments creates barriers for those who are left out of the traditional banking system to access their pace—and to access the Internet.

Toward the end of our semester, we learned that the Everyday Cafe building formerly housed a post office. We were struck by this finding. We realized that this particular repurposing of a postal building is emblematic of what not to do within communities. Instead, we see the future of USPS utilizing its infrastructure to remove barriers to

5. Henry, Maya. "Everyday Café opening in Homewood, filling a void." Next Pittsburgh. 11 November 2016. https://www.nextpittsburgh.com/city-design/everyday-cafe-homewood/?fbclid=IwAR1jz7KvapQTLYT7I89Mmt-I864oyXde6MR2D7JkxOLx_QkQo_vZndLX6mE

Research

Through our research, we sought to answer the question: How might the postal infrastructure be utilized to enable Internet access and decrease digital equity? In order answer this, we conducted research into two areas: digital equity and infrastructure.

Digital Equity

The digital divide is the uneven distribution in the access to, use of, and impact of computers and the Internet. We endeavoured to synthesize and enrich existing research around digital equity in Pittsburgh and around the country.

Improving Digital Equity in the City of Pittsburgh

In 2015, a group of graduate students from Carnegie Mellon University's Heinz College produced a report that considers strategies to bridge the digital divide in Pittsburgh[6]. This report posits that there are three main issues to consider when thinking about digital equity, and that a user who lacks any one of these things is unable to fully participate in the digital world: access to an Internet connection, physical tools to connect to the Internet, and literacy about how to use the Internet. This project was a part of the City of Pittsburgh's Roadmap to Inclusive Innovation.

Inclusive Innovation Roadmap - Pittsburgh

Inclusive Innovation was a joint collaboration between the City of Pittsburgh, the Department of Innovation & Performance and The Urban Redevelopment Authority; its roadmap laid out a number of initiatives the City should undertake in the coming months and years to remain a hub of innovation for social groups, companies and people[7]. These initiatives included a spatial analysis and mapping of free Wi-Fi hotspots and a plan to address it; increased public wireless Internet accessibility in communities through public locations such as CitiParks and senior centers; options to check-out wireless hotspot stations from the library; and expand the municipal fiber network in partnership with anchor institutions to allow increased Internet connectivity for communities in need. At the time of writing this, the efforts were labeled as "5% on-track," but they continue through the purview of OnePGH Resilient Pittsburgh, a strategy for Pittsburgh to thrive in the 21st century as a city of engaged, empowered and coordinated neighbors[8].

6. Getsie et al. Digital Equity in the City of Pittsburgh. 16 December 2015.

7. City of Pittsburgh, Department of Innovation & Performance. Pittsburgh Roadmap for Inclusive Innovation. 2015.

8. City of Pittsburgh. OnePGH Resilient Pittsburgh, 2017.

Internet Infrastructure

USPS Office of the Inspector General White Papers

We also surveyed recent white papers from the USPS Office of the Inspector General.

We discovered that the OIG had previously explored the possibility of a partnership between the Postal Service and rural telecommunications companies to establish a digital postal network and ensure adequate digital access in rural areas, in order to continue to fully serve rural communities even if postal services are reduced[9]. While this plan was not adopted, the white paper does indicate that the USPS has perceived value in this augmentation of its infrastructure.

In 2012, the OIG reviewed the technical and economic aspects of broadband propagation to determine whether it would be beneficial for the USPS to align with the 2010 U.S. National Broadband Infrastructure Initiative[10]. The paper concluded the postal service's expansive footprint of properties could be used to encourage network upgrades and competitive entry, particularly in unserved or underserved areas.

Another white paper from 2013 explored the opportunity for USPS to establish a one-stop, shared, multi-channel service platform to help all levels of government fill these gaps while reducing redundant costs; in this paper, the OIG broaches the opportunity for the USPS to lease facility space to Internet and mobile service providers for the installation of network connection equipment[11]. This affirmed our hypothesis of USPS' potential as a broker of wireless access.

9. USPS Office of the Inspector General. A Possible Pilot Collaboration between Rural Telecom Providers and the Postal Service. 8 February 2013.

10. USPS Office of the Inspector General. 21st Century Post Office - Aligning with the National Broadband Infrastructure. 23 January 2012.

11. USPS Office of the Inspector General. e-Government and the Postal Service — A Conduit to Help Government Meet Citizens' Needs. 7 January 2013.

FCC National Broadband Plan

The Federal Communications Commission's National Broadband Plan set out a roadmap for initiatives to stimulate economic growth, spur job creation and boost America's capabilities[12].

The plan mentions an idea that we had considered in our ideation: a study of spectrum utilization in the US could use inexpensive frequency scanners installed on postal trucks or other fleet vehicles and would cost $10–$15 million. Not only do the scalability and affordability of this plan make them very appealing to understanding issues of digital equity and infrastructure in the US, they also open the door to conversations about use of other kinds of sensors on postal fleet vehicles, which offers another potential stream of revenue for the USPS.

The National Broadband Plan mentions that many city and county initiatives that are enabled by broadband exist, but there is no systematic collection of information that would allow for rigorous evaluation and lead to an understanding of best practices. One of the provocative ideas mentioned is Alameda County, California, and their integrated data warehouse for social services that saves $11 million a year by reducing duplicative work and improving detection of fraud. This secure model presents another opportunity: digital cloud storage of mail by USPS. If implemented, this plan would require the establishment of a digital infrastructure including universal broadband access and secure data centers; this may open a new possible revenue stream through rental of storage to private companies, local government.

12. Federal Communications Commission. National Broadband Plan. 2010.

Opportunity

"The mission of the U.S. Postal Service is to provide the American public with trusted, affordable, universal service. Congress and the President set forth this mission by recognizing the Postal Service's critical role in commerce and in binding the nation together."

–USPS Universal Service Obligation

The United States Postal Service should become a broker of broadband connectivity to maintain its mission of connecting people across the U.S. with opportunities, services, and each other based on its trusted reputation within communities and its Universal Service Obligation.

We propose turning Post Office buildings into community anchor institutions by partnering with local ISPs and leasing space for transmission infrastructure on Post Office property and potentially on that of postal lessors. In this way, the USPS will deliver the "Digital Last Mile," access to broadband Internet and all the resources and opportunities it affords.

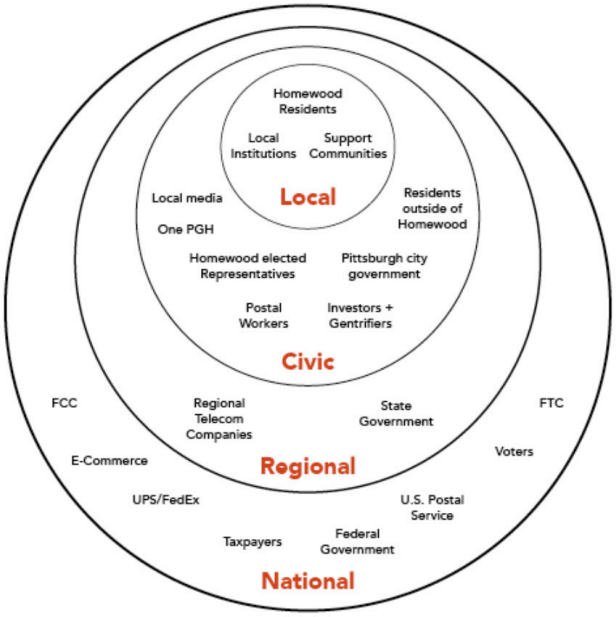
Such a move would help enable more equitable access to the Internet for Americans in urban and rural environments. Like libraries and schools, post offices already function as community hubs of connection; the evolution of the USPS to expand information access and connectivity aligns with the existing Universal Service Obligation, which is essential to ensuring that everyone receives the mail service they need. This would also lay down important infrastructure for USPS to pursue new digital alternatives to daily hardcopy mail delivery, as well as open up new opportunities for innovation.

“But trust cannot be commanded. It can only be nurtured and inspired by a healthy community between people who feel bound by a social contract. ‘Trust is something that emerges from how people interact politically, for mutual benefit, through institutions,’ adds the Harvard University political philosopher Michael Sandel. ‘Healthy communities build civic muscles that lead to greater trust.’”

–from Thank You for Being Late by Thomas L. Friedman

Proposed System

Below is a visualization of our proposed system. While countless stakeholders may be affected with introduction of the Digital Last Mile system because of the avenues that will open up due to Internet access, we focused on the relationship between the USPS, residents of communities across America currently underserved by digital connectivity options, local Internet service providers, local governments, and the postal infrastructure. These are the nodes that are essential to the implementation of expanded broadband access.



Post Offices: Local Internet Service Providers (ISPs) could rent space on post office roofs transmit their signal, expanding their service footprint to include more potential customers.

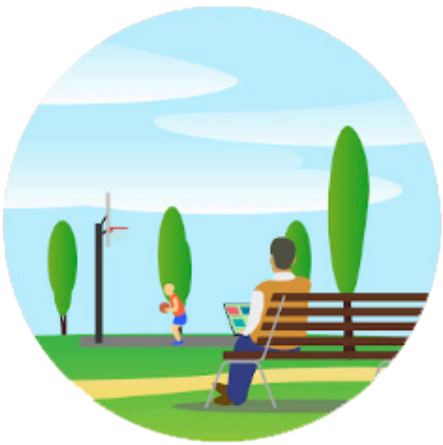
Public Spaces: Local governments can establish contracts with the United States Postal Service's Digital Last Mile program to offer public Internet within public spaces, like parks, senior centers, and warming stations.

Homes: Through the Digital Last Mile program, residents can sign up for at-home Internet plans through a local ISP contract that locks in a rate for low-income households negotiated by the local branch of USPS.

Postal Delivery Trucks: Local governments and local ISPs can rent space for sensors on postal delivery trucks to collect data about connectivity strength, W-iFi dead zones, and more.

Stakeholders

In mapping our stakeholders, we grounded our model in Homewood; however, this model could be picked up and translated to any other community in the United States. Multiple layers of stakeholders will be involved in the negotiation and roll-out of the Digital Last Mile program, and we believe that this system will be built both from the top-down and the bottom-up, in that federal agencies and local entities will have to articulate the implementation of the system, and equity will be seeded and grown at at a community level by trusted entities. The trust that the United States Postal Service has earned will help in bringing stakeholders on-board.



Value Proposition

We believe that the USPS should become a broker of broadband connectivity to maintain its mission of connecting people across the US with each other based on its trusted reputation within communities and its Universal Service Obligation. Our research indicates that such a system would provide considerable value to multiple stakeholders.

USPS

By leveraging its existing infrastructure to support digital transformation, the USPS will incur value in the form of increased relevance to American communities in the 21st century. The Postal Service will also open itself up to new revenue streams: the leasing of postal infrastructure to enable broadband access, as well as the opportunities that will result from the expanded footprint of connectivity. USPS will be able to consider new digital innovations as well, such as secure digital mail boxes and the implementation of and leasing access to Internet of Things infrastructure on postal dropboxes, fleet vehicles, and more.

Local Internet Service Providers (ISPs)

By partnering with a historically trusted brand that supports communities, local ISPs could position themselves as opposite big ISPs (like Comcast and Verizon) that have a track record of distrust through poor customer service and questionable business practices. USPS could also lease space to local ISPs on postal delivery trucks to attach sensors detecting things like Wi-Fi dead zones and areas with poor connectivity strength. These local ISPS could utilize the data collected from these sensors to improve their network..

Local Government

Local governments could find value in the data about their area collected via sensors mounted on USPS delivery trucks. If local governments pay USPS to lease space for these sensors, they could provide the data as open source to residents, as well. It would be important to keep this data transparent because of existing concerns among the general public related to privacy and surveillance. USPS can view Alphabet's Sidewalk Labs as a cautionary tale for their piloting of sensors at a city level[13].

Because of broadband access, we could also imagine USPS creating secure online systems for local governments to share bills, documents, and receipts with their residents, as proposed in the USPS Office of the Inspector General white paper, A Possible Pilot Collaboration Between Rural Telecom Providers and the Postal Service[14].

13. Bliss, Laura. "How Smart Should a City Be? Toronto is Finding Out." CityLab. 7 September 2018. https://www.citylab.com/design/2018/09/how-smart-should-a-city-be-toronto-is-finding-out/

14. USPS Office of the Inspector General. A Possible Pilot Collaboration between Rural Telecom Providers and the Postal Service. 8 February 2013. https://www.uspsoig.gov/sites/default/files/document-library-files/2015/rarc-ib-13-001_0.pdf

Residents

USPS-brokered broadband infrastructure will enable digital equity for people who either live in areas where high-speed Internet is difficult to get or who do not have the resources to pay for broadband in their homes. Increased access to the Internet will bring greater economic opportunity to American communities and dismantle barriers faced by those who are currently excluded by the digital divide. Increased Internet connectivity can also yield increased social connectivity by bridging divides across distance. Residents may also feel comfortable purchasing broadband via a smaller ISP when it has partnered with USPS, one of the most trusted brands in the country.

Businesses

Increased access to high-speed Internet through the Digital Last Mile will prove to be a valuable infrastructure for current and future businesses. For instance, 29 percent of U.S. farms have no access to the Internet[15]. with the expanded connectivity footprint, farmers will be able to leverage their new Internet connections to adopt precision agriculture methods, increasing efficiency, economy, and sustainability. Elsewhere, entrepreneurs will be able to access the Internet affordably, helping catapult new ventures into the world.

15. United States Department of Agriculture. Farm Computer Usage and Ownership. 2017.

Conclusion

We understand that the United States Postal Service has previously researched, written about, and discussed possible futures for broadband, but has not implemented these proposals. Amid new allocations to digital infrastructure, the USPS should utilize its own infrastructure to close the broadband divide through facilitating the expansion of broadband connectivity. This Digital Last Mile is a continuation of the tradition of serving every address in the nation. If digital equity is a three-legged stool of access, hardware, and literacy, then the USPS can provide the workshop in which that stool gets built. By investing in the Digital Last Mile, the agency will help catalyze development and progress across America.