The Official Digital Opportunity Plan for Mathews, VA

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Broadband Telecom

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INTRODUCTION

1.1 Background and Acknowledgements

The Infrastructure Investment and Jobs Act (IIJA) of 2021 represents one of the most ambitious efforts in United States history to close the digital divide. This legislation introduced two tentpole programs that were aimed at providing infrastructure and resources to the least-served communities in America: the Broadband Equity, Access, and Deployment (BEAD) Program, and the Digital Equity Act (DEA), both administered by the National Telecommunications and Information Administration (NTIA). BEAD allocated $42.45 billion to expand broadband infrastructure across the country, with a central focus on unserved and underserved areas, both rural and urban, and the DEA allocated 2.75 billion among states to introduce a program to focus on aspects of the digital divide beyond the extension of broadband infrastructure, a practice known as digital opportunity. BEAD also has a portion of money saved for similar practices, known as non-deployment funding. Many communities face barriers that limit their ability to benefit from high-speed internet even when it becomes available. These include lack of affordable service, limited access to connected devices, low digital literacy, and lack of awareness - or even trust - of available programs. The DEA and BEAD non-deployment funding are designed to address these exact challenges. It aims to build the necessary social, educational, and institutional scaffolding to ensure that broadband investments translate into real-world impacts for real people. NTIA has made it clear that non-deployment investments are not optional side projects; they are integral to the success of the BEAD program. Despite this previous claim, in the recent months since this plan was developed, some shifts within NTIA and federal leadership have resulted in major changes to these programs – including changes to how the deployment portion is administered, as well as freezing non-deployment projects and the elimination of DEA programs all together. This plan marks the last vestige of federal DEA support. This does not remove the real-world importance that this practice has, but makes local support all the more crucial.

Virginia's Office of Broadband, a part of the Department of Housing and Community Development (DHCD), created their own State Digital Opportunity Plan[1] to identify regional partners and resources, as well as methods to strengthen local capacity to promote broadband adoption. These include workforce training initiatives to develop a skilled labor force capable of supporting the growing digital economy; digital literacy programs that empower individuals to safely and confidently navigate online services, and affordability efforts that help residents access and sustain service, often by helping them enroll in federal and state subsidies. Other uses of DEA funds include providing connected devices to those who cannot afford them and supporting local organizations that serve as trusted digital resources in communities such as libraries, schools, senior centers, and nonprofits. This Act also created a process for localities to create their own plans, as communities are best served at the local level. Thus, the Virginia Affordability and Adoption Planning Grant (VAAPG) was established, funding the creation of these plans which encourage local government and community partners to work together. The plan that you are reading is a result of this downstream funding and symbolizes collaboration on the federal, state, and local level to make sure that residents of Virginia have access to the digital resources they need to thrive in our digital age. This study marks the result of countless hours of research, analysis, and discussions with policy makers, community groups, local governments, subject matter experts, broadband providers big and small, and members of the public. We hope that this document can provide an established framework for localities to continue this effort as the broadband landscape and needs evolve, provides residents with a necessary view into the resources that are readily available for them to improve their standard of living, and inspires local readiness in the case that federal and regional funding for these programs are reintroduced.

This plan is written for multiple audiences – residents of the Mathews County, their local leaders, and regional and local community organizations who actively work in digital service, and those who might benefit from adding them to its repertoire of community resources. For residents, this document will detail the necessary information to impart an understanding of

[1] https://www.dhcd.virginia.gov/sites/default/files/DocX/vati/dop-appendix-files/virginia-digital-opportunity-plan.pdf

broadband and highlight the resources available in your community that can help lower your barriers to access. For local leaders, you will gain awareness of community organizations who are doing the work and nationally tested projects that can be realized through collaboration with these groups, as well as some sample projects and available avenues of funding. Community organizations will gain insight into resources that are available on the federal and state level to improve or add digital programming into their service offering, as well as gain insight into other organizations who are doing the work and can provide potential synergy when looking to expand services and capacity.

A newly connected household will not truly benefit from broadband if its members cannot afford service, do not have a functioning computer, or lack the skills to navigate job applications, telehealth platforms, or educational content. Non-deployment funding ensures that BEAD does not just build out infrastructure, but also builds up communities, capacities, and confidence. It is the responsibility of localities, through administrative leadership and community impact organizations who must both give them a fishing rod *and* teach them how to fish.

The county has set up a landing page to follow developments with this effort: broadband4mathews.info/digital-opportunity/

It is important to acknowledge the Mathews County Board of Supervisors and community members that made this possible:

Ramona Wilson, County Administrator

Judi Green, Assistant County Administrator & Deputy Clerk to the Board

Ashley Hubbard, Accounting Analyst

Judy Rowe, Chair, Mathews Broadband Advisory Board

Willie Love, Vice Chair, Mathews Broadband Advisory Board

Pearl Foster, Secretary, Mathews Broadband Advisory Board

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Mathews Community Foundation

Mathews County Public Schools

Mathews Memorial Library

Mathews Resource Council

PCs for People

Riverside Mathews Medical Center

Three Rivers Health District

United Way Virginia Peninsula

VA Tech for Troops

West Mathews Community League

SECTION

02

DIGITAL OPPORTUNITY: WHAT IS IT?

2.1 Internet in the Modern Age

The evolution of the internet is a story of necessity - what began as a narrow military communication experiment eventually became a backbone of modern civilization.[2] Its roots were laid in the Cold War era, where Soviet spies and high-stakes espionage were not just left for James Bond. The U.S. Department of Defense (DoD) wanted to improve the security of their critical information by creating a more resilient, decentralized communication system that would not be compromised if one site was tactically bombed. In 1969 they launched ARPANET, a network that connected universities and military facilities for this purpose. Eventually, they found even more applications for this communication technology in military and research sectors. As ARPANET was developed, it introduced computer graphics, parallel processing, computer flight simulation, and other key achievements such as packet switching, file transfer protocols, even e-mail and instant messaging, which became foundational to the service we know today. By 1975, these functions caused more communication networks unaffiliated with the DoD to spring up internationally.

It only took a few more years for the internet to have its "official" birthday, being January 1, 1983. This occasion was marked by Vincent Cerf's creation of Transfer Control Protocol/Internetwork Protocol (TCP/IP), which established a standard communication system that let computers on these different networks "talk" to each other by transmitting files and data. Now, networks that were established in Hawaii, London, and Norway, could be linked, igniting the global level of communication that we take for granted. It was almost another decade until the next significant breakthrough in 1991, which was Tim Berners-Lee and Robert Cailliau's[3] creation of the World Wide Web at CERN, setting up 'tentpoles' of information that could be remotely accessed by navigating to a specific address.[4] Coincidentally, this was the year that Al Gore advocated for President George H.W Bush to sign the *High Performance Computing and Communication Act of 1991*, allocated $600 million for high performance computing and for the creation of the *National Research and Education Network* (NREN). The NREN brought together industry, academia and government in a joint effort to accelerate the development and deployment of high-speed networking technologies. A year later, students at the University of Illinois created the first internet browser called MOSAIC (which later became Netscape). This marked an experience closer to the internet we currently use and marked the beginning of the internet boom in the 90s.

At the same time, The National Science Foundation's creation of NSFNET connected more universities and opened the gates for broader research and institutional participation by connecting them to commercial networks. Domains, hyperlinks, and HTML pages quickly multiplied. Email became a primary mode of communication, and by the mid-1990s, commercial providers like AOL, Amazon, and eBay began to dominate internet traffic.

The 2000s brought broadband and mobile access, which untethered the internet from dial-up modems and static desktops. This shift enabled the mass adoption of search engines like Google changing the way knowledge was accessed; social media networks like Facebook and Twitter reshaping personal and political expression; e-commerce giants like Amazon redefining global commerce; and streaming services revolutionizing entertainment. Cloud computing, beginning in earnest in the late 2000s, allowed data and applications to move from local storage to remote servers, setting the stage for scalable, globalized access to information and services.[5]

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[2] Abbate, Janet. Inventing the Internet. Cambridge: MIT Press, 1999.

[3] Mr. Caillau is oft unfairly left out of mention for this accomplishment. However, the author of this document has met him in person and is happy to spread the word. ~ *Robert, I am sorry for the trespass. I often wonder if you ended up purchasing that other unit.*

[4] *A short history of the Web*. CERN. https://home.cern/science/computing/birth-web/short-history-web

[5] *Cloud Computing: Gartner Hype Cycle shows Cloud Computing at Peak | Formtek Blog*. (n.d.). https://formtek.com/blog/cloud-computing-gartner-hype-cycle-shows-cloud-computing-at-peak/

Soon thereafter, the ability for mobile devices to be more powerful than the average personal computer erased the lines between people and the sole necessity of personal computers to get online, allowing 24/7 access to all of these services. The explosion of mobile apps, location-based services, and real-time communication tools transformed the way people worked, learned, and socialized. The rise of platforms like Uber, Airbnb, and Instacart demonstrated how the internet could disrupt traditional industries in transportation, hospitality, retail, and others. Meanwhile, internet-connected devices from thermostats to smart wearables ushered in the era of the Internet of Things (IoT), expanding digital reach beyond into more facets of daily life.

In the modern age, the internet's most important use cases are deeply interwoven with essential aspects of life and society. Education has been revolutionized by digital classrooms, online courses, and remote learning, whose importance was made especially clear during the lockdowns of the COVID-19 pandemic. Telehealth has become a lifeline for patients in remote areas with limited mobility, while remote work through video conferencing, cloud collaboration tools, and virtual private networks have reshaped the labor landscape. Financial services have evolved through online banking, peer-to-peer payment apps, and cryptocurrency, bringing new ways to access and manage money. The internet today is not simply a tool, but a foundational layer of modern life, woven into nearly every system, industry, and aspect of daily existence. It has evolved from a patchwork communication network into a globally distributed infrastructure that enables real-time interaction, on-demand access to information, automation of services, and the coordination of complex social and economic systems. Its reach is vast, but its impact is most deeply felt in how it has redefined human experience. While many reading this are familiar or regularly use these features, it is important to be aware that to many people, most of these concepts are still completely 'alien'.

Despite the rapid advancements that broadband connectivity has brought, there is a dark side to this unprecedented level of connectivity. The rise of Artificial Intelligence (AI) has made deepfakes and AI-generated scams more convincing, leaving older adults especially at risk. Many people also use tools such as ChatGPT to answer questions in place of search engines, trusting its output uncritically, creating a false sense of comprehension and potentially becoming misinformed.[6] Some people even develop romantic relationships with chatbots, leaving them susceptible to 'catfishing' scams and other effects that we don't truly understand yet.[7] Cryptocurrencies, often touted as tools of financial inclusion, have also become vehicles for fraud and exploitation, with countless users (many in low-income communities) falling prey to pump-and-dump schemes or wallet scams. Social media though a platform for connection and advocacy, can amplify misinformation, cyberbullying, and extremist content, particularly in echo chambers and where critical media skills are lacking. In communities newly coming online, unfiltered exposure to biased, false, or manipulative information can erode trust in public institutions and worsen political polarization. But perhaps the most pressing issue is the surrendering of personal data that we opt into everyday using these platforms that collect data on every aspect of our life. Smart devices, such as rings or watches monitor our personal health data, browsers record all of our web interactions, and our phones track our every move; all this data is legally able to be bought and sold for customized advertisements or even surveillance purposes.[8] In fact, defense contractor Palantir Technologies was just tapped by the United States government to create federal profiles of every American, using AI to comb

[6] Wiseman, P. (2025, April 5). Can you really trust AI? *Analytics that Profit*. https://www.analyticsthatprofit.com/blog/can-you-really-trust-ai

[7] Dhaliwal, J. (2025, February 12). *AI chatbots are becoming romance scammers—and 1 in 3 people admit they could fall for one*. McAfee Blog. https://www.mcafee.com/blogs/privacy-identity-protection/ai-chatbots-are-becoming-romance-scammers-and-1-in-3-people-admit-they-could-fall-for-one/

[8] S.J.Res.34 - 115th congress (2017-2018): A joint resolution providing for congressional disapproval under Chapter 8 of title 5, united states code, of the rule submitted by the Federal Communications Commission relating to "protecting the privacy of customers of broadband and other telecommunications services". | congress.gov | library of Congress. (n.d.). https://www.congress.gov/bill/115th-congress/senate-joint-resolution/34

through all digital information that can be traced back to an individual.[9] Luckily, there are some services available online, such as DeleteMe or Incogni, that can remove Personally Identifiable Information (PII) that is hosted on the web.[10] The past three decades of technological advancement has already propelled us to a place that was once only imagined in Sci-Fi novels. But this, along with the proposed 10-year freeze on all new state-level AI legislation[11], brings us further into uncharted territory. Knowledge and vigilance in how to safeguard yourself online is more critical than ever. The internet is a powerful tool, but it is becoming increasingly apparent that the responsibility in understanding its drawbacks falls squarely on the individual and local leadership.

2.2 The Case for 'Digital Opportunity'

At the individual level, the internet has transformed how people communicate and ultimately participate in society. Video calling and social media allow family members, friends, and coworkers to interact in real time anywhere in the world as long as they have a suitable internet connection. Peer reviewed research and historical records which once required a trip to the library are now accessible through a few taps on a smartphone (as long as you know where to find valid sources). Digital media in the form of television, movies, video games, and music are easier to access than ever before, using algorithms to tailor content to individual preferences and creating a seemingly endless delivery of entertainment that is specifically attuned to one's personal tastes. People more and more are relying on these methods to fill the needs of their everyday life, opting for convenience and accessibility (think Amazon Prime's two day shipping) than courses of action that cause more friction (using gas to drive to and then physically shop at Walmart – without computer-assisted navigation).

In education, schools and universities increasingly rely on hybrid and online models, especially after the global COVID-19 pandemic revealed the need for ubiquitous, resilient digital infrastructure. The latest report by April ABA shows that in 2023, 49% of students *globally* participated in some kind of e-learning, with 70% of students feeling that online learning is more effective than solely traditional classroom methods.[12] The market size of this industry is estimated to balloon to over $370 billion in 2026, cementing the idea that primary schools and universities will find increasing ways to adopt this technology into curricula. But then, where does that leave the students without reliable access to broadband or devices?

In the workforce, the internet has enabled a shift from centralized offices to remote and distributed work. Cloud-based productivity suites, project management tools, and video conferencing platforms allow teams to collaborate across time zones and borders. You might not have your manager there physically breathing down your neck, but enterprise level software still gives them complete insight into how you use your time through productivity statistics that can be used to compare you to your colleagues. Entire sectors have shifted to becoming digital-native - from the likes of cab services and delivery drivers being replaced by Uber and DoorDash, respectively, to remote software development teams and people making a living anywhere in the world through content creation. Even traditional industries are reshaping operations through automation, data analytics, and digital customer service channels with the increase in IoT enabled hardware providing insights into every

[9] Desk, G. (2025, May 30). Palantir to create vast federal data platform tying together millions of Americans' private records, stock. *The Economic Times*. https://economictimes.indiatimes.com/news/international/us/palantir-to-create-vast-federal-data-platform-tying-together-millions-of-americans-private-records-stock-jumps/articleshow/121521062.cms?from=mdr

[10] Although, if your PII is already on the 'Black Market', there's only so much you can do other than undergo a legal identity change – and even more inconveniently, get a new phone number.

[11] *Ten-year moratorium on AI regulation proposed in US Congress | DLA Piper*. (n.d.). https://www.dlapiper.com/en-us/insights/publications/ai-outlook/2025/ten-year-moratorium-on-ai

[12] *E-Learning/Online Learning Statistics*. (n.d.). https://www.aprilaba.com/resources/e-learning-online-learning-statistics

aspect of a process. The pandemic accelerated this trend, revealing both the flexibility, and fragility, of an internet-dependent labor market.

The healthcare sector has undergone a similar transformation through telehealth services, online patient portals, wearable health trackers, and AI-assisted diagnostics. Patients in remote or underserved areas can consult with specialists via video conferencing. Electronic health records allow providers to share patient data securely and efficiently. The integration of internet technologies into healthcare is not only improving access but also enabling predictive and preventative care through remote monitoring and more frequent check-ins[13].

The economy at large is now deeply dependent on internet infrastructure. E-commerce has outpaced traditional retail in many sectors. Financial technology (fintech) firms offer mobile banking, peer-to-peer transfers, microloans, and even decentralized finance (DeFi) through blockchain. Cryptocurrencies, digital wallets, and embedded payment systems are reshaping monetary systems and access to financial services. The data economy, fueled by real-time user interaction, advertising platforms, and behavioral analytics, has created trillion-dollar companies whose primary assets are data and timing.

Technologically, the modern internet is increasingly 'running in the background'. IoT has extended the internet beyond screens, becoming ambient and pervasive. AI, enabled by cloud computing, massive data flows, and extreme amounts of on-grid power, is now deeply integrated into how the internet. AI development is seen as the next great disruptor, fueling another 'space-race' that will radically shift society. However, areas that do not have sufficient infrastructure to benefit will only be faced with further disparity by the inability to keep up with productivity and innovation.[14]

Perhaps most critically, the internet now underpins democratic participation and civil society and has redefined civic life. Public discourse largely takes place online, from news consumption to political organizing. Governments use digital tools to engage citizens, deliver services, and even conduct voting in some countries.[15] At the same time, the internet has also become a battleground for disinformation, cyberattacks, surveillance, and algorithmic manipulation. The same platforms that empower grassroots activism can also be exploited for propaganda and polarization. This duality has spurred intense global debates about regulation, governance, and even 'truth'. Yet with this transformation comes heightened responsibility and risk: issues like digital privacy, cybersecurity, misinformation, and algorithmic bias have become front-line concerns in the stewardship of the internet's power.

In essence, the internet and broadband connectivity by extension have become a fundamental necessity for participation in modern society, for better or worse. For some, a broadband connection is almost as crucial as having electricity. Others are blissfully unaware of the concept of a Virtual Private Network (VPN) or the term 'blockchain'. Regardless of a person's individual experience, the guiding principle of this plan is: *everyone deserves the ability to access broadband and the digital services that it offers, whether they ultimately chose to or not.* That is the core argument of 'Digital Opportunity'.

The term Digital Opportunity is relatively new, being an evolution and combination of a few different concepts. Stemming from part of the BEAD program's 'non-deployment' portion of funding, the NTIA passed the 'Digital Equity Act'[16], allocating

[13] Ezeamii, V. C., Okobi, O. E., Wambai-Sani, H., Perera, G. S., Zaynieva, S., Okonkwo, C. C., Ohaiba, M. M., William-Enemali, P. C., Obodo, O. R., & Obiefuna, N. G. (2024). Revolutionizing Healthcare: How telemedicine is improving patient outcomes and expanding access to care. *Cureus*. https://doi.org/10.7759/cureus.63881

[14] Schellekens, P, Skilling, D. (2025, April 5). Three Reasons Why AI May Widen Global Inequality *Center for Global Development*. https://www.cgdev.org/blog/three-reasons-why-ai-may-widen-global-inequality

[15] *International internet voting*. (n.d.). Verified Voting. https://verifiedvoting.org/international-internet-voting/

[16] Authors note: the funding for this program was rolled back federally on May 9, 2025. This plan was completed and delivered as part of the funds that had been committed to each state already, but the future of the Digital Capacity and Competitive grant programs remain unclear. For more information, please see 'Section 3.4 - NTIA's BEAD Program and the Current State of Broadband Funding' for full details on the reinterpretation of the 2021 legislation.

$2.75 billion dollars for states to devise their own plan (of which this document is a downstream product of enabling localities to assess their own needs) which focus on NTIA's defined 'Covered Populations':[17]

- Persons who are 60 years of age or older
- Incarcerated individuals
- Veterans
- Persons with disabilities
- Members of a racial or ethnic minority group
- Rural residents
- Individuals with a language barrier, including those who are English learners or have low literacy levels
- Individuals living in households with incomes not exceeding 150 percent of the poverty level

While on paper the 'Digital Equity Act' may not be everyone's cup of tea, it is well intentioned – the goal of the legislation was to bring awareness to a real-world problem through the examination of groups that are at the most risk by the digital divide and understand the most effective ways to serve them. This notion is entirely driven by data that shows these particular demographics have unique struggles in participating and taking advantage of digital services. For example, Pew Research shows that in 2021, Black and Hispanic adults were less likely on average to have a traditional computer and home broadband to access digital services.[18] Another study during this time demonstrated that Americans with at least one disability were 18% less likely to have any type of computing device, including a personal computer or smartphone[19] - resulting in lower participation in telehealth or digital services that could potentially improve their quality-of-life (QoL). More current data from this institution describes in general that minority, elderly, those with less educational accomplishments, people with lower household income, and those in rural areas are more 'smartphone dependent' meaning that they have less access to computing devices other than their phone, making it more difficult for these groups to participate in remote education and work, as well as access telehealth appointments.[20] Regardless of the specific social factors that might play into these statistics, these trends show a positive (increasing, not *good*) relationship between falling in these 'Covered Populations' and facing issues with access to broadband and devices, and digital services. Inclusion in this manner means lowering the barriers of access for these groups in order for them to be on an even playing field. For example, catering to a rural community could mean expanding an affordable/free personal computer (PC) program from its nearest presence in the closest county to a satellite site in a local recreation center (notably equity and inclusion practices thought of in this framework apply to rural communities in no small part). The act of 'including' starts by identifying the group and problem it faces and enacting a catered solution. It is important to acknowledge that people are not monoliths; every individual has their own unique strengths and perspectives, as well as ways of interacting with the world. By large, people do share commonalities based on culture, shared experiences, and the way they interact with society, as well as how society interacts with them. Regardless, grouping people by demographic factors allows us to collect data and create action, so sometimes it is important to paint in broad strokes

[17] US Census Bureau. (2024, March 28). *Digital Equity Act of 2021*. Census.gov. https://www.census.gov/programs-surveys/community-resilience-estimates/partnerships/ntia/digital-equity.html

[18] Perrin, A. (2025, April 24). Home broadband adoption, computer ownership vary by race, ethnicity in the U.S. *Pew Research Center*. https://www.pewresearch.org/short-reads/2021/07/16/home-broadband-adoption-computer-ownership-vary-by-race-ethnicounty-in-the-u-s/

[19] Anderson, M. (2025, April 24). Americans with disabilities less likely than those without to own some digital devices. *Pew Research Center*. https://www.pewresearch.org/short-reads/2021/09/10/americans-with-disabilities-less-likely-than-those-without-to-own-some-digital-devices/

[20] Atske, S., & Gelles-Watnick, R. (2025, April 24). *Americans' use of mobile technology and home broadband*. Pew Research Center. https://www.pewresearch.org/internet/2024/01/31/americans-use-of-mobile-technology-and-home-broadband/

and understand the ways different groups might share their own common strengths and struggles in order for institutions to better understand how to serve them. This is only one side of 'Digital Opportunity'.

The other side is an expansion of the term 'Opportunity' – empowerment beyond just the act of inclusion. The focus here might not be covered in the original guidelines of the NTIA's legislation but is an important concept that builds on the idea of 'digital literacy'. This idea also complements the state priorities outlined by Governor Youngkin, as reiterated in DHCD's Digital Opportunity Plan. To wholistically implement digital opportunity means to also look for solutions that increase economic competitiveness, improve Virginia's education system, and protect constituents from recurring environmental challenges and crime. Addressing issues which can have a disproportional effect on covered populations, as well as approaching technology in a way that allows all people to take full advantage of it – and be aware of its more subtle influences on their life - underscores the true meaning of Digital Opportunity.

Technology and its use cases expand every single day, but it is hard to keep up without empowering people to access it and providing to them with the knowledge to unlock its full capabilities. On a county-wide level, one example is StormSense, a sensor network developed by the Virginia Institute of Marine Science in conjunction with the Mathews County that measures real-time flooding. Anyone that has been to the City of Norfolk during a storm knows that even with moderate rain, some of the roads become entirely inaccessible to vehicles, causing major delays or reroutes. With StormSense, and its integration with Amazon Alexa, anyone can join the app and ask Alexa to ping a specific sensor and anticipate if there will be any disruptions to your route.[21] This is a powerful technology that is implemented on a regional scale, which can improve QoL to anybody that knows they have access to it and understands its proper applications. Opportunity reflects the *Advancement* of technologies that can be used in daily life to address the specific difficulties communities face. This concept also has a dual purpose to educate any type of reader, especially if you do not identify with a covered population or as a community leader. For everyone else, they can get an understanding of the most widely adopted modern technologies utilized by municipal governments akin to Mathews. This allows for people and effected communities to provide two-way visibility with their local government and community groups in order to work on solutions collectively and not be kept in the dark about which digital practices are already bearing on their everyday life. Through this knowledge, people may be able to advocate their local governments for technologies that seem as impactful, or away from technologies that may be perceived as harmful to personal liberties.

Inequity exists at all levels of this discussion. Many of the technologies covered at the beginning of this section remain a mystery to a large portion of people. You may know how to use a VPN but have no clue about cloud computing. You may use ChatGPT in your day-to-day but not realize one of its best uses is to create a personal diet plan that can be customized based on your macronutrient breakdown and daily caloric expenditure – using only what you have in your refrigerator at the time.[22] Empowering individuals to exist in this new landscape of digital opportunities requires them to understand it. Through firsthand experience with broadband, the internet, and internet-reliant technologies, people can learn how to apply these to their everyday life and not feel left behind. The notion that the internet is a 'young-man's game' just doesn't apply when everyone's life is becoming increasingly dependent on its systems, data is being created for each individual that is being bought and sold for less than savory purposes, and the idea of freedom is becoming more and more intertwined with your ability to understand your place in how these concepts intersect. This is the essence of *Digital Equity* – being able to afford and grasp, monetarily and mentally, the benefits and drawbacks that this connectivity brings. Perhaps the National Digital Equity Center (NDEC) in Maine has the most comprehensive definition of this term:

[21] https://www.vims.edu/people/loftis_jd/StormSense/

[22] *ChatGPT - Meal Planner*. (n.d.). ChatGPT. https://chatgpt.com/g/g-VA2ApAENM-meal-planner

> "A condition in which all individuals and communities have the information technology capacity needed for full participation in our society, democracy, and economy. Digital equity is necessary for civic and cultural participation, employment, lifelong learning, and access to essential services."[23]

Digital Equity is a practice that aims to provide solutions for the 'Digital Divide'; by extension, *Digital Opportunity* also encompasses the role of technology in people's lives and their ability to grow and succeed from it.

This document will predominantly focus on two of the main barriers to digital inclusion – affordability and adoption. The other, access, is also an imperative, but is being addressed through the BEAD deployment program (more info in Section 3.4) and has major overlap with affordability, particularly device access. The asset list in Section 4 will also include some locally and regionally adopted technologies, under the lens of advancement. The remaining portion of this section will describe these ideas in detail. Following that is a primer on broadband technology (that can be skipped if you have a basic understanding, or even just used as a reference), then a profile on the Mathews County and its community partners under the lens of each covered population and existing resources available to them. From there, the gaps will be examined using national best practices that are not currently being implemented, and how their success can be measured if a willing party wants to implement them, formatted in a manner to streamline pursuing these projects through grant funding or other means of local project intake. This will also include a showcase of tentpole projects that address the most critical needs of Mathews, strategically based around community partners who have had a voice in this process. Finally, the conclusion will summarize the big takeaways presented and be accompanied by some useful appendices that define broadband related terms and discuss the results of the survey that was offered as part of this project and a glossary.

Everyone deserves the ability to access broadband and the digital services that it offers, whether they ultimately chose to or not.

2.2.1 Affordability

Today, where everything from job applications and healthcare appointments to homework and government services has migrated online, the cost of internet access determines who gets to participate and who is left behind. Without affordable service and devices, millions of Americans - particularly those already facing structural disadvantages - are excluded from the full benefits of a connected society. According to the NTIA, affordability is a major barrier to internet use across the United States. In its 2021 Internet Use Survey, the NTIA found that nearly 15% of offline households cited cost as the primary reason for not subscribing to internet service at home.[24] This is obviously an issue for low-income households, which heavily coincides with other disadvantaged groups under NTIA's covered populations. For instance, about one in 10 adults older than 65 were living in poverty in 2022.[25] In a slightly dated study by the Urban Institute in 2009, it was seen that 58% of American

[23] https://www.islandinstitute.org/ii-solution/improving-digital-literacy/

[24] *Switched off: Why are one in five U.S. households not online? | National Telecommunications and Information Administration*. (n.d.). https://www.ntia.gov/blog/2022/switched-why-are-one-five-us-households-not-online

[25] Ochieng, N., Cubanski, J., Neuman, T., & Damico, A. (2024, May 21). *How many older adults live in poverty? | KFF*. KFF. https://www.kff.org/medicare/issue-brief/how-many-older-adults-live-in-poverty/

families that were classified as low-income were ethnic minorities.[26] The American Psychological Association (APA) found that unemployment rates for the blind or visually impaired were 70%, and this rose by ten percent (80%) for the intellectually or developmentally disabled.[27]

For lower income households, broadband access becomes a choice among many essential expenditures that can be afforded for the month. For example, just 61% of households earning less than $25,000 per year reported having internet access at home, compared to 95% of households earning $75,000 or more. Similarly, only 54% of individuals aged 65 and older reported using the internet daily, compared to 85% of those aged 25–44. People with disabilities were 11 percentage points less likely than those without disabilities to use the internet at home. Additionally, rural households lag behind their urban counterparts in both affordability and access, due to both economic and infrastructure constraints.[28] These households are frequently in a position to weigh broadband access among other essential needs for the month, and in some scenarios emergency expenses can force them to forego this service along with having to be aware not to waste their limited, metered mobile data. These households are considered 'subscription vulnerable', which puts them further at risk to be cut off from consumer financial benefits or healthcare service efficiencies; simply put, it is a negative feedback loop - broadband access could introduce other cost savings or the ability to have visibility and opt into benefits, but without home access, this is more difficult to achieve for someone having to make ends meet with little spare time.[29]

Further, affordability encompasses more than the price of a broadband subscription. It includes upfront costs (installation fees, modem or router purchase), ongoing expenses (data caps, overage fees), and the cost of suitable devices like laptops, tablets, or smartphones. The Alliance for Affordable Internet defines affordability as achieved when 1 GB of mobile data costs less than 2% of a person's monthly income.[30] For a household of four, making less than $48,225 a year ($4,018 a month) places them 150% of the 2025 Federal Poverty Level (FPL), resulting in an affordable monthly subscription price of $80.38. Yet in the U.S., many low-income individuals - especially those in rural and tribal areas, spend well above this threshold particularly when relying solely on mobile plans.

Like BEAD funding, the federal government launched the Affordable Connectivity Program (ACP) as part of the IIJA to address this crisis. The ACP provided up to $30/month for broadband service ($75/month for households on Tribal lands) and a one-time discount of up to $100 for a connected device. Unfortunately, the program ended in April 2024 due to lack of additional funding from Congress, leaving more than 22 million households, predominantly containing low-income and marginalized populations, without this crucial subsidy.[31] At its peak in December 2023, the county had 15,579 beneficiary subscribers for the month, and locally saved $9,998,830 total for the duration on the program.[32] Eligibility was automatic if you already had monthly assistance through the Supplemental Nutrition Assistance Program (SNAP), Medicaid, or other programs. Even though there is no direct federal program that takes its place, many Internet Service Providers (ISPs) offer their own low-cost

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[26] Simms, M. C., Fortuny, K., & Henderson, E. (2009, August). *Racial and ethnic disparities among low-income families*. Urban Institute. https://www.urban.org/sites/default/files/publication/32976/411936-racial-and-ethnic-disparities-among-low-income-families.pdf

[27] American Psychological Association. (2017). *Disability & Socioeconomic Status*. American Psychological Association. https://www.apa.org/pi/ses/resources/publications/disability

[28] *Key findings for Fiscal Year 2022 | National Telecommunications and Information Administration*. (n.d.). https://www.ntia.gov/report/2024/2023-federal-broadband-funding-report-investing-internet-for-all/key-findings-for-fiscal-year-2022

[29] *Broadband Affordability is an Ongoing Challenge for Low-Income*. (2024, July 24). Benton Foundation. https://www.benton.org/blog/broadband-affordability-ongoing-challenge-low-income-households

[30] A4AI Alliance For Affordable Internet. (2016, April 14). *About A4AI - Alliance for Affordable Internet*. Alliance for Affordable Internet. https://a4ai.org/who-we-are/about-a4ai/

[31] *The FCC is Taking Steps to Wind Down the Affordable Connectivity Program*. (n.d.). Federal Communications Commission. https://www.fcc.gov/fcc-taking-steps-wind-down-affordable-connectivity-program

[32] https://www.usac.org/about/affordable-connectivity-program/acp-enrollment-and-claims-tracker/

packages for means-tested households, as well as promote the Lifeline program which offers a smaller and more stringent level of monthly assistance. More information on available programs can be seen in Section 4.

Market conditions also play a role in affordability. In areas where only one or two ISPs operate, prices are higher, and service quality is often lower due to lack of competition. According to the FCC, 33% of Americans in rural areas and 27% on Tribal lands lack access to broadband at minimally acceptable speeds. In these areas, even when broadband is technically available, high costs make it inaccessible for many.[33]

Affordability is further complicated by opaque pricing structures, data caps, and fees that disproportionately burden low-income users. As mentioned, Pew Research shows that Black and Hispanic households are more likely to be "smartphone-dependent" for internet access and thus more vulnerable to high mobile data costs and limited monthly usage. This form of digital tiering limits the depth and quality of participation in online life, saving it for the bare necessities. Not having access to a dedicated personal computer makes it more difficult for families to access services such as telehealth appointments, develop digital skills such as using the Microsoft Office suite (Word, Excel, PowerPoint - or its Google alternatives), or other programs that could open the doors for different educational outcomes (Google Earth to a career in geospatial analysis, for instance). There is clear data that having a home internet connection makes the digital experience more productive for many people, enabling them to save money through online banking and researching products before they buy, using telehealth for remote doctors' visits or participating in e-learning and doing school assignments, or even looking for jobs, creating resumes, and learning new skills.[34] This opportunity cost is only increasing with the recent tariffs implemented, making personal computers and their components (and let's face it, technology across the board) harder to afford in general.[35]

Other than geographic availability, affordability is the fundamental barrier to broadband access that hits low-income and disadvantaged populations the hardest. Solving the affordability gap requires a coordinated, multi-sector approach. This includes long-term federal funding for subsidies in place of ACP, stronger price transparency regulations, support for community broadband and municipal networks, and greater competition among ISPs. It also requires integrating affordability efforts with digital literacy and device access initiatives, so that subsidized connectivity translates into sustained and meaningful use.

2.2.2 Adoption

Digital adoption, the process by which individuals and communities develop the skills and confidence to use digital tools effectively, is another essential pillar of digital opportunity. Without the digital skills to navigate the internet, fill out forms, apply for jobs, engage in telehealth, or use secure platforms, individuals remain disconnected - even if they are technically online. At its core, digital adoption is rooted in digital literacy: the concept that an individual is more likely to opt into and use digital services if they have a fundamental understanding of the benefits and convenience it can bring into their life.

This challenge is especially acute among the covered populations. According to NTIA's Internet Use Survey, significant gaps in adoption persist among these groups. For example, as of 2021[36]:

[33] Congressional Research Service. (2019). *Broadband internet access and the digital divide: federal assistance programs* (No. RL30719). https://sgp.fas.org/crs/misc/RL30719.pdf

[34] *How home internet adoptions improves people's lives*. (n.d.). BSG. https://www.bsgco.com/policy-fact-sheet?ref=broadbandbreakfast.com

[35] Westover, B. (2025, April 11). Cheap laptops on the chopping block: With tariffs looming, should you buy now? *PCMAG*. https://www.pcmag.com/opinions/cheap-laptops-tariffs-should-you-buy-right-now#

[36] *New NTIA data show enduring barriers to closing the digital divide, achieving digital equity | National Telecommunications and Information Administration*. (n.d.). https://www.ntia.doc.gov/blog/2022/new-ntia-data-show-enduring-barriers-closing-digital-divide-achieving-digital-equity

- Only 54% of individuals aged 65 and older used the internet daily, compared to 85% of those aged 25–44.
- People with disabilities were 11 percent less likely to have internet service at home compared to those without disabilities.
- Among households with annual incomes below $25,000, only 57% had a laptop or desktop computer, compared to 91% of those earning $75,000 or more.
- Rural Americans were about 8 percentage points less likely to use the internet at home than urban Americans.

These statistics reiterate the disparity between covered populations and tech literate Americans on the other side of the digital divide. Measured gaps in access are closely linked to digital literacy and skills. Digital adoption is not just about having a device or a connection, it is about being able to use that connection meaningfully. This includes knowing how to send emails, access virtual government services, use productivity software, evaluate online information, and protect personal data. These gaps are especially prominent in frontline industries such as retail, food service, and manufacturing - sectors that more frequently employ people of color and those from lower-income backgrounds.[37] Without targeted digital skills training, these workers face long-term economic exclusion as industries automate and digitize. In an increasingly digitized world, these competencies are becoming increasingly foundational, not optional.

Since the beginning of 2025, there has been a marked shift away from funding of programs that assist vulnerable populations and make it more difficult for people to access benefits that they have relied on for years. For example, Social Security payments are no longer going to be made by check past September 30, 2025.[38] Rather, seniors and disabled individuals (among other beneficiaries) will have to set up direct deposit to their bank account or government-issued card. For people who are not digitally literate, there may be a steep learning curve to access and learn how to navigate digital banking. Conversely, filing claims has been more difficult because there is no online option, and over 7,000 jobs in the Social Security Administration have been cut, resulting in slowed claims processing and more processing errors. Both children and elderly people rely on these benefits, potentially losing up to 40% of household income where both are beneficiaries.[39] When these systems shift, people fall through the cracks, unable to keep up. In this scenario, digital literacy is not about knowing how to access services but understanding how to keep updated and skilled for these developments in real time.

To further that previous example, it is important to note that the Congressional Budget Office (CBO) has estimated that almost 11 million existing recipients will lose their Medicaid coverage by 2034 due to changes implemented by the One Big Beautiful Bill Act (OBBBA), signed into law on July 4, 2025. This act introduces changes to eligibility centered around stricter work requirements and twice-a-year income verification checks.[40] People who are unaware of these changes, or struggle to upload their income documentation online will be at risk to lose coverage, with some being none the wiser until it they are in a health situation and need to use it. While there are other courses of action some of these individuals can take in Virginia[41], this potentially has other downstream effects, such as closure of rural healthcare providers who disproportionately rely on

[37] Cai, J. Y., & Mattingly, M. J. (2025). Unstable work schedules and racial earnings disparities among U.S. workers. *RSF the Russell Sage Foundation Journal of the Social Sciences*, *11*(1), 201–223. https://doi.org/10.7758/rsf.2025.11.1.10

[38] Hall, L. (2025, March 27). White House plans to eliminate social security payments by paper check. *Money*. https://money.com/white-house-eliminates-paper-checks/

[39] Williamson, M. W. (2025, July 3). *Trump administration attacks on Social Security put kids and families at risk*. Center for American Progress. https://www.americanprogress.org/article/trump-administration-attacks-on-social-security-put-kids-and-families-at-risk/

[40] Weixel, N., Choi, J., & O'Connell-Domenech, A. (2025, June 4). *11 million could lose insurance coverage: CBO*. The Hill. https://thehill.com/newsletters/health-care/5333534-11-million-could-lose-insurance-coverage-cbo/

[41] *Staying covered if you lose Medicaid or CHIP*. (n.d.). HealthCare.gov. https://www.healthcare.gov/medicaid-to-marketplace/

Medicaid covered individuals to stay afloat.[42] SNAP benefits and rural housing programs are being diminished in a similar fashion.

Efforts to promote digital adoption typically fall into two categories: basic digital literacy training (e.g., how to use a computer, navigate the web, send an email) and applied digital skills (e.g., using spreadsheets, navigating telehealth platforms, engaging in online learning or job applications). Programs such as the digital navigator model, which places trained individuals in communities to provide one-on-one support, have emerged as highly effective solutions, especially in underserved areas.[43] Libraries, adult education centers, and community-based organizations often serve as anchors for these efforts.

However, contemporary digital skills initiatives face significant challenges. Funding is frequently piecemeal, often tied to short-term grants or pilot projects. Many programs lack culturally and linguistically relevant content, which is critical for engaging immigrant and limited-English-proficient populations. Others struggle to reach older adults or people with disabilities who may face physical or cognitive barriers to participation. Moreover, there remains a stigma among some adults in admitting they need help with technology, creating another layer of difficulty in outreach and engagement.

Workforce readiness is another critical component of digital adoption. As the labor market continues to evolve, digital skills are increasingly becoming prerequisites for employment. Even entry-level jobs in logistics, healthcare, or customer service often require using scheduling software, mobile apps, or digital inventory systems. Employers report difficulty finding workers with the basic tech skills necessary for modern roles, while many workers (especially those already in low-wage jobs) lack access to affordable upskilling opportunities.[44]

Schools and youth programs also play a role, but digital adoption is not limited to younger generations. Adults over 60 make up a large share of the digitally under-skilled population. While students may be "digital natives," research shows they often lack deeper digital competencies such as evaluating sources, using tools productively, or understanding online privacy. These struggles extend to other age groups as well, especially with the increase in AI "deepfakes",[45] polarized, biased news articles, and the ability for anyone to go online and say whatever they want using any alias. We have all heard the idiom, "Don't believe everything you see on the internet" (which previously, referenced television),[46] but due to how advanced technology has become and how algorithms are tailored to maximize engagement at all costs, it is much more difficult to discern what is real (for a good example of how good AI is at faking real-life already, watch the video linked in this footnote).[47]

Ultimately, digital adoption is what turns broadband access into opportunity. It is the mechanism by which individuals transition from being consumers of content to creators, learners, earners, and engaged, informed citizens. It is also more crucial than ever to be vigilant and understand the potential effects misleading and fake content can have. Without the appropriate skills, connectivity investments fall short of their promise and benefits that are rightfully available to residents in this country are veiled behind obscurity. In this way, digital skills training and literacy programs are not merely educational interventions; they are civil rights strategies for the digital age.

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[42] National Rural Health Association. (n.d.). *NRHA's Rural Health Voices Blog | National Rural Health Association - NRHA | NRHA*. National Rural Health. https://www.ruralhealth.us/blogs/2025/06/federal-medicaid-cuts-imperil-rural-hospitals-and-residents-new-report-finds

[43] Digital navigator model. National Digital Inclusion Alliance. (2025, May 16). https://www.digitalinclusion.org/digitalnavigatormodel/

[44] Sundararajan, A. (2025, April 22). Workforce capacity development and occupational transitions with dignity. *Brookings*. https://www.brookings.edu/articles/workforce-capacity-development-and-occupational-transitions-with-dignity/

[45] Goodwin, L. (2024, December 20). *"AI deepfake romance scam duped me out of £17k."* https://www.bbc.com/news/articles/cdr0g1em52go

[46] And prior to that, probably the radio.

[47] https://www.youtube.com/watch?v=FERa1AI2EK8

2.2.3 What Else Technology Can Address

While broadband access and digital literacy are critical to digital equity, there is a growing need to expand the conversation to include other transformative technologies that can address factors that disproportionately affect disadvantaged and covered populations. Such technologies may enhance resilience, environmental awareness, prevent or lessen the impact of crime, and generally improve overall quality of life. For marginalized communities, particularly those facing compounding risks from severe weather events, economic instability, and infrastructure neglect, adopting technologies such as weather sensors, air quality monitors, smart utility systems, and localized alert platforms can make the difference between surviving a crisis and falling victim to systemic vulnerability.

Weather and disaster-related technologies are a case in point. Communities of color, low-income neighborhoods, and rural areas are more likely to be affected by natural disasters, often due to their location in flood-prone areas or their lack of access to early-warning systems and mitigation infrastructure.[48] Rural counties that do not have appropriate emergency alerting infrastructure, especially the multitude of those with large coast communities in Virginia, even more so. For example, according to the Environmental Protection Agency, Black and African American individuals are 34% more likely to live in areas with the highest projected increases in weather event driven mortality. Moreover, affordable housing is likely to be built on land that is cheaper, which is due to factors like being in less desirable areas, more prone to flooding, and having less surrounding investment in general. Due to this, these areas which may contain a higher degree of covered populations are more prone to being at risk.[49] Comprehensively, these groups are more prone to illnesses related to heat, air and water pollution, an impacted food system, insects, and downstream mental health effects.

In this context, enhanced alerting based on community sensor networks, including low-cost flood gauges, temperature and humidity monitors, and air quality sensors can serve as early warning systems. These tools can alert residents in real time about rising floodwaters, poor air quality due to wildfires or industrial activity, or heat events that disproportionately impact elderly or chronically ill residents. However, the benefits of these technologies depend on adoption, deployment, and sustained use - and currently, access and implementation are uneven.

In times where severe climate incidents are increasingly frequent, there have been federal cuts to organizations such as the National Weather Association (NWA) and National Oceanic and Atmospheric Administration (NOAA), removing 600 and 1,300 employees, respectively,[50] which resulted in vacancies for crucial positions. This has a direct result on the predictive ability of these organizations to accurately assess weather events through less weather balloons being deployed (with staffing cuts being a stated reason), as well as use this data to alert civilians in the case of severe warnings (due to vacancies for top positions such as warning coordination meteorologists and permanent science officers).[51] Regardless of if these will be filled or not, the current situation during this perceived transition period has been at the center of recent disasters such as the catastrophic flooding in Texas, which was underestimated and occurred in the early hours of the morning, as well as the delay in the usual alerting of six tornadoes in Nebraska – which was still implemented at the right time but could have been issued sooner given the usual resources. Even when forecasting is good, there is a problem with the ability to alert the most

[48] *Climate change and the health of socially vulnerable people | US EPA*. (2025, April 9). US EPA. https://www.epa.gov/climateimpacts/climate-change-and-health-socially-vulnerable-people

[49] Monica Sanders, Nielsen, O., & Sanders, M. (2024, October 21). *Why Affordable Housing is more vulnerable to disasters*. PreventionWeb. https://www.preventionweb.net/drr-community-voices/why-affordable-housing-more-vulnerable-disasters

[50] Sherman, L. J. E. M. A. (n.d.). *Trump cut but did not 'defund' National Weather Service*. @Politifact. https://www.politifact.com/factchecks/2025/jul/08/social-media/national-weather-service-noaa-cuts-texas-flood/

[51] Questions and calls for accountability grow in Texas after deadly floods. (2025, July 8). [Video]. NBC News. https://www.nbcnews.com/science/science-news/national-weather-service-nws-staff-cuts-trump-budget-texas-floods-rcna217139

vulnerable citizens in the 'last mile'.[52] Both of these organizations have spent countless research hours on tackling this question and identifying methods of real time alerting to populations that do not have mobile or television access – and are in turn likely the most vulnerable.[53] Upcoming cuts to their budget beyond staffing could eliminate all of the research roles of both of these organizations, eliminating crucial outreach and information dissemination practices that are being developed nationally;[54] in turn, localities may individually have to enhance their own public safety operations and coordination practices to alert these individuals. This problem falls squarely into the lane of digital opportunity and has more immediate consequences if not addressed. As mentioned prior, Virginia Beach's StormSense integration with Amazon's Alexa platform is one such practice that brings people closer to this critical information. However, ensuring equitable access to emergency tech is not just a matter of infrastructure, it requires outreach, culturally relevant education, and trusted intermediaries to translate data into action. Extreme weather events will imminently happen, be it a 100-year flood or more frequent events. The question is, how can we position to be prepared for these events, rather than just react after the damage is done? If all people in a community are affected, some can leave their homes and may unfortunately not be able to come back to one. But for those that struggle to have the means to leave – how can we help them proactively?

Beyond environmental monitoring, other technologies such as remote medical diagnostics, smart grid sensors, and assistive technologies for people with disabilities offer enormous potential to improve public health and autonomy. For instance, smart inhalers that respond to real-time air quality data can reduce asthma emergencies, while wearable devices can alert caregivers to falls or heart irregularities in seniors. Better yet, combining medical devices environmental monitoring such as locality-placed air quality sensors can empower suffering individuals to make more informed decisions about where they should be during an irritant spike.

But again, adoption barriers persist. These include affordability, lack of awareness, distrust in technology due to various reasons, and inadequate local infrastructure. Addressing these gaps requires intentional design, participatory planning, and policy interventions that prioritize community ownership, interoperability, and funding accessibility. Having eagle-eyed awareness on these communities and their challenges, as well as having a firm understanding of the technologies and policy positions that could be used to address them is key from a community leader perspective. This plan aims to give a start to this type of comprehensive approach, but as challenges evolve with demographic and other societal shifts, as well as funding availability and federal priorities – each locality should make an ongoing proactive effort to mobilize on these types of projects.

In conclusion, the equitable adoption of emerging technologies, especially those related to weather, health, and safety, is essential for resilience. Communities that are already marginalized should not be the last to benefit from tools that can help them survive and thrive. As with broadband, ensuring access to these technologies is not just about innovation; it is about dignity, protection, and equal opportunity in a world increasingly shaped by uncertainty.

2.3 Covered Populations and Their Barriers to Inclusion

In the pursuit of a digitally inclusive society, understanding who remains excluded is as important as identifying how. The NTIA, through the Digital Equity Act, defines a set of "covered populations" who are most at risk of digital exclusion. These

[52] NBCUniversal News Group. (2025, April 22). *Meteorologists say NWS cuts degraded forecasts during recent storms*. NBCNews.com. https://www.nbcnews.com/science/science-news/meteorologists-say-nws-cuts-degraded-forecasts-recent-storms-rcna202386

[53] AMETSOC. (n.d.). https://journals.ametsoc.org/downloadpdf/view/journals/wcas/6/1/wcas-d-13-00009_1.pdf

[54] Satre, Z. (2025, May 8). New NOAA budget details plans to eliminate most weather and climate research. *KCCI*. https://www.kcci.com/article/new-noaa-budget-details-plans-to-eliminate-most-weather-and-climate-research/65322021

groups face persistent and intersecting barriers to full digital participation. Their experiences reflect the structural inequalities embedded in both digital systems and society at large.

This section aims to explore these populations on a large scale and examine their 'zoomed out' characteristics and issues with digital access. For a closer look at these groups in the Mathews County, please refer to Section 4.

1. Low-Income Households (Covered Households)

Profile: *Households earning less than 150% of the Federal Poverty Level (FPL). This group includes families struggling to meet basic needs like food, housing, and healthcare.*

Note: The Federal Poverty Level changes each year due to inflation and is location dependent (i.e., different between the contiguous 48 states and D.C vs. Alaska and Hawaii due to the increased average cost of living). This figure and your deviation from the FPL are important to determine eligibility requirements for federal programs such as Medicaid, Children's Health Insurance Program (CHIP), and Health Insurance Premium Tax Credits. As of 2025, to be considered withing 150% of the FPL, household income but be equal or less than $23,475 for a single person, $31,725 for a household of two, $39,975 for a household of three, and $48,225 for a household of four. To calculate your FPL percentage, please refer to the link below in the footnote.[55]

Common Obstacles:

- Tighter budgeting. Frequently weighing financial decisions according to perceived necessity and budget, making broadband service a lower priority than basic necessities.
- Lack of stable housing and housing options in general, which can limit availability of fixed internet services. Affordable housing more than often faces lower levels of broadband expansion and has older infrastructure that can make having suitable connectivity more difficult.[56]
- Lower digital literacy and less exposure to digital skills training through less opportunities to own and use broadband enabled devices. Broadband and its benefits are seen as 'less relevant' to their own lives and these individuals sometimes lack interest in subscribing, even when service is in the realm of affordability, even with subsidies like ACP or Lifeline.[57]
- Since low digital literacy makes it harder for individuals to have awareness of available resources, in turn, this can make them 'digitally invisible' - having no online presence, which leads to not being able to be reached out by internet or resource providers.
- Many low-income families rely on their mobile service for their connectivity needs but are usually still beholden to data caps that limit their ability to be online, or cheaper unlimited plans that start throttling data (slowing down the speeds at the user's end) that can make using the internet a frustrating experience.

[55] https://aspe.hhs.gov/sites/default/files/documents/dd73d4f00d8a819d10b2fdb70d254f7b/detailed-guidelines-2025.pdf

[56] Trusts, P. C. (2023, April 3). *Broadband challenges and opportunities in affordable rental housing*. The Pew Charitable Trusts. https://www.pew.org/en/research-and-analysis/issue-briefs/2023/04/broadband-challenges-and-opportunities-in-affordable-rental-housing#:~:text=The%20reasons%20for%20this%20low,other%20federally%20subsidized%20multifamily%20housing.

[57] Lathen, D. (2025, March 7). *States must tackle the real obstacles to broadband adoption*. Broadband Breakfast. https://broadbandbreakfast.com/states-must-tackle-the-real-obstacles-to-broadband-adoption/

Low-income households often encounter the most immediate and tangible barrier: affordability. According to the NTIA, only 73% of households earning less than $25,000 per year have any type of internet access at home, compared to 95% of those earning $75,000 or more.[58] For these families, the monthly cost of internet service, combined with upfront expenses for devices and equipment, frequently competes with other essential needs like food or housing. Even when subsidy programs like ACP exist, low enrollment persists due to awareness gaps and administrative complexity. For many low-income households, reliance on mobile phones for internet access (due to cost) also limits access to more robust services like remote learning, telehealth, and job applications. This specific designation shares much overlap with other covered populations.

2. Aging Individuals

Profile: Adults aged 60 and older. This demographic includes both retired individuals and those still engaged in part-time or full-time work. Many live on fixed incomes, have age-related health concerns, or experience social isolation, making affordable broadband a necessity to access telehealth and social platforms for the sake of their wellbeing. As the U.S. population ages, the number of tech-literate adults is expected to increase, but addressing systemic factors that make broadband more accessible is essential to equitable service delivery, especially in healthcare, social services, and financial management.

Common Obstacles:

- One in ten adults over the age of 65 live in poverty and rely on fixed incomes, [59] perceiving broadband as a luxury rather than a necessity. Many lack access to subsidy programs like ACP due to awareness issues or eligibility confusion.
- Over half of seniors report discomfort using computers or smartphones. Tasks like creating a strong password, completing an online form, or adjusting privacy settings can feel intimidating or inaccessible, discouraging regular use.[60]
- Vision impairments, arthritis, hearing loss, or memory decline can make navigating digital interfaces more difficult. Interfaces not designed with accessibility in mind often frustrate or exclude older users. Even with accessibility options available, they may be hard to navigate or opt into for individuals already struggling.
- Seniors are both more targeted and susceptible when it comes to online scams and fraud.[61] As an effect, fear of being taken advantage of can lead to withdrawal from digital spaces entirely.
- Many seniors perceive broadband as irrelevant to their lives, especially if they do not work or have children at home. The benefits of telehealth, online social engagement, and home-based services are often underexplained or not clearly demonstrated. Even conveniences such as home IoT devices, such as smart lighting or locks are perceived as too difficult to navigate.
- Without a nearby caregiver, tech-savvy family member, or community digital navigator, seniors often have no one to guide them through setup, troubleshooting, or skill-building. This “support gap” reinforces feelings of digital exclusion.

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[58] *New NTIA Data Show 13 Million More Internet Users in the U.S. in 2023 than 2021 | National Telecommunications and Information Administration*. (n.d.). https://www.ntia.gov/blog/2024/new-ntia-data-show-13-million-more-internet-users-us-2023-2021

[59] Ochieng, N., Cubanski, J., Neuman, T., & Damico, A. (2024, May 21). *How many older adults live in poverty? | KFF*. KFF. https://www.kff.org/medicare/issue-brief/how-many-older-adults-live-in-poverty/

[60] An, J., Zhu, X., Wan, K., Xiang, Z., Shi, Z., An, J., & Huang, W. (2024). Older adults’ self-perception, technology anxiety, and intention to use digital public services. *BMC Public Health*, *24*(1). https://doi.org/10.1186/s12889-024-21088-2

[61] FBI. (2024, April 30). *Elder fraud, in focus*. FBI. https://www.fbi.gov/news/stories/elder-fraud-in-focus

Although older adults are the fastest-growing demographic online,[62] many lack the skills to properly use the resources available to them. Pew Research reports 64% of those aged 65 and older have home broadband connections, compared with 86% of those aged 30-49 and 79% of those aged 50-64.[63] And while device ownership has risen, around one-quarter of seniors still lack any device capable of robust internet use - a gap that makes participation in telehealth, civic engagement, or online service portals nearly impossible. Reluctance to adopt new technology and learn even basic skills make it difficult for seniors to navigate functions such as searching for specific emails or accessing tax documents.[64] These challenges compound for rural seniors, those living alone, or individuals with disabilities. Without targeted interventions, such as accessible training, bundled device-and-broadband programs, and consistent digital support, older adults' risk being left out of an increasingly digital world.

3. Incarcerated Individuals (and Formerly Incarcerated)

Profile: People currently incarcerated in jails, prisons, and detention facilities, as well as those recently released and reentering society. The United States has one of the highest incarceration rates globally, with nearly 2 million individuals incarcerated at any given time and over 600,000 released annually.[65] Incarcerated individuals, particularly from low-income and marginalized backgrounds, face some of the most profound digital exclusion in the country due to systemic disconnection from technology, limited access to the internet, and persistent barriers during reentry.

While some facilities allow tightly restricted use of email, video visitation, or education apps, these tools are often expensive, closely surveilled, and lack full functionality. Upon release, individuals face a digital society where tasks such as job applications, housing searches, benefit enrollment, and healthcare access require digital fluency - skills that are often outdated or never acquired during incarceration. As of 2018, the average incarceration length in state prisons U.S. was 2.7 years, and 14.4 years for federal prisoners.[66] Three years may not seem like that long in the grand scheme of things, but this period of digital inactivity creates significant gaps in digital knowledge and familiarity with contemporary technologies. To avoid recidivism, these individuals need the proper support upon release.

Common Obstacles:

- Most prisons and jails do not allow open internet use. Federal prisons completely ban internet use except for electronic messaging through the Trust Fund Limited Inmate Computer System (TRULINKS), established in 2009. State prisons allow fee-based messaging by way of JPay which allows video conferencing, messaging, and e-mail for a fee. For instances where cellphones or other devices are smuggled in, an inmate could face serious consequences if found out – such as solitary confinement.

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[62] Tobey, A. (2022, October 28). *Technology usage among Seniors | Ross Media Solutions*. Ross Media Solutions. https://www.rossmediasolutions.com/2022/10/technology-to-market-to-seniors/

[63] Blazina, C. (2025, April 24). Share of those 65 and older who are tech users has grown in the past decade. *Pew Research Center*. https://www.pewresearch.org/short-reads/2022/01/13/share-of-those-65-and-older-who-are-tech-users-has-grown-in-the-past-decade/

[64] Authors note: Once in Office Depot, when I was using the self-serf printing station, two separate older people came up to me asking for help with both of these tasks. I was astonished that the first had no idea that there was a search function for her email - she was simply trying to find an enrollment letter for her grandchild's new school. I was less shocked at the gentleman not being able to access his insurance cards through his smartphone – a task probably better left to a desktop computer rather than on-the-fly with a mobile device. Regardless, I am sure if I stayed there longer more people would have asked me for help, despite the uniformed employees being clearly unoccupied!

[65] Initiative, P. P., & Wagner, W. S. a. P. (n.d.). *Mass Incarceration: The Whole Pie 2025*. Prison Policy Initiative. https://www.prisonpolicy.org/reports/pie2025.html

[66] Kaeble, D. & U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics. (2021). Time served in state prison, 2018. In Bulletin (Report NCJ 255662). https://bjs.ojp.gov/content/pub/pdf/tssp18.pdf

- To further expand on JPay and similar services, they are often expensive, with messages costing up to $0.35 to send or receive (yes, you need to pay separately for both) and video calls as high as $1 per minute, making regular use unaffordable for most incarcerated individuals and their families. They also provide simplistic and costly tablets that look like "a less colorful version of a tablet designed for preschoolers, but with a clear case that prevents inmates from hiding contraband materials inside."[67] Prisons can also collect a portion of the money sent to the inmate by their families in order to pay for these services.[68]
- Instruction is typically delivered via offline or closed systems, and in many facilities, even digital educational content is rare or non-existent. Fewer than 35% of correctional institutions offer any form of internet-based learning or digital literacy training to incarcerated students who may be preparing for higher education when released.[69]
- The digital world and related experience evolve rapidly, and the longer an individual is incarcerated, the more likely they are to emerge with little or no experience using smartphones, email, video conferencing, or online platforms. A 2019 Vera Institute study noted that the majority of returning citizens lacked basic computer skills, with a greater likelihood the longer the sentence.[70]
- Successful reentry to society, which normally entails gainful employment, is difficult for someone with a criminal record. Lacking digital skills puts these job candidates at even more of a disadvantage, and lacking opportunities when out of prison increases the likelihood of recidivism.
- Post-release, many returning citizens avoid digital platforms due to fears of surveillance by parole officers, law enforcement, or third parties. Returning citizens expressed reluctance to use digital tools for banking or communication due to concerns about tracking and monitoring.[71]

Incarcerated and formerly incarcerated individuals are one of the most underserved digital populations. Their exclusion is structural, economic, and policy driven. Without dedicated interventions, this population remains at a disadvantage in education, employment, healthcare, and civic participation, with a higher chance of ending up back behind bars.

For incarcerated individuals and those reentering society, acclimating to modern technology can be daunting and overwhelming. Most prisons restrict or completely ban internet access, and many incarcerated people spend years with no exposure to current technologies. Upon release, they face a digital world that has evolved and a society that now expects online proficiency for everything from applying for a job or social services to managing a bank account. Few correctional or reentry programs offer digital upskilling, leaving many individuals unable to navigate basic tasks necessary for reintegration. There is some support for incarcerated students, but not to the extent that is needed. The lack of technology training, combined with social stigma and economic instability, compounds their isolation from digital opportunity. Some of the largest

[67] Tynan, D. (2017, September 20). Online behind bars: if internet access is a human right, should prisoners have it? *The Guardian.* https://www.theguardian.com/us-news/2016/oct/03/prison-internet-access-tablets-edovo-jpay

[68] Which should be a crime in itself if you ask me!

[69] Badejo, J., Chakraborty, J., Aseltine, E., Oyaniyi, L., & Badejo, O. (2025). Closing the digital gap for incarcerated students using learning management systems in the USA. *Proceedings of the 17th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications*, 518–530. https://doi.org/10.5220/0013385700003912

[70] https://news.umich.edu/facilitating-a-smooth-technological-transition-for-citizens-returning-from-prison/

[71] Morgan, G., Walker, C., & Taxman, F. (2025). Understanding the access to and use of digital technology by people in the criminal legal system: empirical findings from Wales. *Health & Justice*, *13*(1). https://doi.org/10.1186/s40352-025-00326-8

factors that reduce recidivism rates are access to housing and stable employment, but support through educational programs during their time served has also proven to be a critical measure.[72]

4. Veterans

Profile: Individuals who have served in the U.S. Armed Forces, including active duty, reserve, and National Guard service members who are now discharged. As of 2024, there are approximately 17.6 million veterans in the United States according to the U.S department of Labor. Veterans represent a diverse group across age, race, gender, and geography, but many face challenges related to healthcare access, housing stability, mental health, employment, especially those in rural areas, with disabilities, or experiencing homelessness.

Common Obstacles:

- Nearly one-third of veterans live in rural communities, where broadband availability is often limited or unreliable.[73] Overall, 15% of Veteran households do not have an internet connection.[74] This creates significant barriers to accessing online VA services, telehealth appointments, and employment opportunities.
- Veterans are more likely than the general population to experience hearing loss, traumatic brain injury (TBI), PTSD, and mobility limitations, all of which can affect their ability to use digital devices effectively. In 2022, 30% of veterans reported having a service-connected disability (up from 15% in 2008).[75]
- Veterans experience homelessness at a higher rate compared to the rest of the U.S population (22 out of every 10,000).[76] Veterans experiencing homelessness or housing insecurity often lack stable broadband access, private locations for telehealth visits, or up-to-date digital devices.
- The average age of Veterans skews older, with almost half aged 65 or older, and about a quarter over 75, according to 2023 data.[77] Many older veterans report limited digital skills or discomfort navigating websites, submitting online forms, or participating in virtual appointments.
- Loneliness and isolation are significant issues for Veterans of all ages, with many reporting that they lack meaningful relationships with people who can understand their own experience. This rate is higher for Veterans diagnosed with

[72] Initiative, P. P. (n.d.). *Prisons of Poverty: Uncovering the pre-incarceration incomes of the imprisoned*. Prison Policy Initiative. https://www.prisonpolicy.org/reports/income.html#%3A~%3Atext%3DIncarcerated%20men%20are%20concentrated%20at%2Cof%20the%20national%20income%20distribution

[73] *VA Health Care: Office of Rural Health Efforts and Recommendations for improvement*. (n.d.). U.S. GAO. https://www.gao.gov/products/gao-24-107245

[74] *Connecting veterans to telehealth care and bridging the digital divide | Connected Care*. (2025, February 9). https://connectedcare.va.gov/whats-new/veterans-corner/connecting-veterans-telehealth-care-and-bridging-digital-divide

[75] US Census Bureau. (2024, November 6). *New report on U.S. Veterans and Service-Connected Disabilities*. Census.gov. https://www.census.gov/newsroom/press-releases/2024/service-connected-disabilities.html

[76] Sage, D. (2023, December 15). Veteran homelessness increased by 7.4% in 2023 - VA News. *VA News*. https://news.va.gov/126913/veteran-homelessness-increased-by-7-4-in-2023/

[77] USAFacts. (2025, April 14). Who are the nation's veterans? *USAFacts*. https://usafacts.org/articles/who-are-the-nations-veterans/

mental health conditions such as depression and PTSD.[78] There is also a high suicide rate for Veterans, especially if they are not connected with the Department of Veterans Affairs.[79]

- Veterans must navigate multiple federal and third-party systems (e.g., VA.gov, eBenefits, My HealtheVet, state workforce portals), which can be difficult to understand without strong digital literacy or technical support.

Despite targeted federal efforts - such as the VA's Digital Divide Consult Program, which refers veterans for subsidized internet and device access - barriers remain due to limited outreach, eligibility complexity, and inconsistent availability of local support services. As a result, many eligible veterans do not receive the help they need to get and stay connected.

According to a 2021 VA study, veterans who did have broadband and a device were more than twice as likely to engage in telehealth appointments than those without. Yet without significant support in device distribution, affordable broadband subscriptions, and tailored digital literacy programs, a large portion of the veteran population will continue to face disproportionate exclusion from essential digital services.

5. People with Disabilities

Profile: Adults and children with physical, cognitive, sensory, or mental health disabilities. Per the NTIA, this covered population includes individuals who have challenges with six specific CDC-defined categories, including hearing, vision, cognition, mobility, ability for self-care, and ability to live independently. In the U.S., approximately 25% of adults have a disability that limits daily living activities. For children, this number is closer to one in 13.[80] Though many own smartphones and tablets, people with disabilities disproportionately face digital barriers: from limited device ownership to inaccessible content and interfaces.

Common Obstacles:

- While 72% report home broadband, which is not much different from the national rate of 78%, adoption of multiple devices is lower: only 62% own a desktop or laptop (vs. 81% non-disabled) and 72% own a smartphone (vs. 88% non-disabled). Only 26% have the full device suite (broadband + computer + smartphone + tablet), compared to 44% of non-disabled adults.
- Adults with disabilities are three times as likely to never go online (15% vs. 5%) Overall, disabled individuals feel much less confident using digital services.[81]
- Only ~4% of top websites are fully accessible; Accessibility errors like poor contrast, missing alternate text, or inadequate keyboard navigation are rampant. 73% of disabled users encounter accessibility issues on more than a

[78] Straus, E., Norman, S. B., Tripp, J. C., Tsai, J., Sippel, L. M., Jeste, D. V., Southwick, S. M., & Pietrzak, R. H. (2021). Behavioral epidemic of loneliness in older U.S. military veterans: Results from the 2019-2020 National Health and Resilience in Veterans Study. *American Journal of Geriatric Psychiatry*, *30*(3), 297–310. https://doi.org/10.1016/j.jagp.2021.07.006

[79] Weissman, S. (2024, February 23). *The economic returns of a rural education*. Inside Higher Ed | Higher Education News, Events and Jobs. https://www.insidehighered.com/news/students/diversity/2024/02/23/economic-returns-rural-education

[80] Statista. (2025, June 5). *Share of people with a disability in the U.S. as of 2023, by age*. https://www.statista.com/statistics/793952/disability-in-the-us-by-age/

[81] *How can we ensure that more people with disabilities have access to digital devices?*. World Economic Forum. (n.d.). https://www.weforum.org/stories/2021/09/disability-barrier-to-digital-device-ownership/

quarter of the sites they visit. 70% of government or news websites do not cater to vision-impaired users, widening the information gap between them and their peers.[82]

- Disabled individuals have a great amount of overlap with other covered populations. They are twice as likely to live in poverty, especially if a minority, with higher rates of food and housing insecurity. Nearly half of all incarcerated women are disabled.[83] 31% of veterans have a service-connected disability, and 43.9% of people over 65 claim to have a disability.[84]
- While device and broadband ownership are increasing, actual use of technology for work, health, and social engagement is uneven and often limited by inaccessible design and insufficient support systems.

People with disabilities face some of the most pervasive and systemic forms of exclusion in general, not just digital. For them, discrimination is all too common, especially if their disability is apparent. Many devices and websites are designed for neuro- and physio-typical individuals in mind. Despite legal protections like the Americans with Disabilities Act (ADA), many websites and platforms remain inaccessible failing to meet basic standards for screen readers, captioning, or keyboard navigation. Affordability is another issue: assistive technology is often costly and not covered by insurance or public subsidies. Additionally, many available programs rarely account for the diverse needs of people with cognitive, developmental, or learning disabilities. This leaves many individuals isolated not only from digital tools but also from the social and economic opportunities they enable.

6. Individuals with a Language Barrier

Profile: People with limited English proficiency (LEP): dually, English learners, including immigrants, refugees, non-native English speakers, individuals from multilingual households, and native English speakers who are low literacy. As of 2023, more than 25.6 million people in the United States are classified as LEP - or speaking English "less than very well".[85] This definition includes people with low-literacy or who have English as a second language (ESL). This population spans diverse backgrounds and ages and is disproportionately represented in low-income, underserved, and minority communities.

Common Obstacles:

- When broadband is available, unfamiliarity with English-language interfaces, technical terminology, and navigation instructions can make the internet functionally inaccessible. According to a 2021 NTIA survey, households where English is not the primary language at home are less likely to have home internet (76%) than English-only households (86%).[86] These disparities are even wider when intersected with low income, education gaps, or immigration status.
- A significant number of essential government, education, health, and workforce websites in the United States offer limited or poor-quality translation options. Even when translation is available, machine-generated content often lacks accuracy or cultural nuance, leading to misunderstandings and mistrust.

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[82] Team, A. (2024, July 11). *30 Key web accessibility Statistics*. Accessibly. https://accessiblyapp.com/blog/web-accessibility-statistics/

[83] Vallas, R., Knackstedt, K., & Lmsw, V. T. (2022b, April 22). *7 Facts About the Economic Crisis Facing People with Disabilities in the United States*. The Century Foundation. https://tcf.org/content/commentary/7-facts-about-the-economic-crisis-facing-people-with-disabilities-in-the-united-states/

[84] *CDC Newsroom*. (2016, January 1). CDC. https://www.cdc.gov/media/releases/2024/s0716-Adult-disability.html

[85] Ramirez, N., Shi, K., Yabroff, K. R., Han, X., Fedewa, S. A., & Nogueira, L. M. (2022). Access to Care Among Adults with Limited English Proficiency. *Journal of General Internal Medicine*, *38*(3), 592–599. https://doi.org/10.1007/s11606-022-07690-3

[86] *NTIA Data Explorer | National Telecommunications and Information Administration*. (n.d.). https://www.ntia.gov/data/explorer#sel=internetUser&disp=map

- Digital literacy programs often rely on English-based curricula or are facilitated by instructors without shared cultural or linguistic backgrounds. As a result, many LEP individuals feel excluded from training spaces or fail to build digital confidence.
- Adults with limited English may rely on children or bilingual relatives for tech use, which can create delays or reinforce inequity in their ability to independently access information and services. Many LEP individuals have limited formal education in any language, not just English. This complicates navigation of web-based platforms, even when translation is provided, and increases reliance on audio-visual content or in-person support.
- Outreach materials for broadband subsidy programs, digital literacy classes, or public access points (libraries, schools) are frequently published only in English, limiting their visibility to non-English-speaking communities.
- Immigrant communities with limited English proficiency may avoid engaging with online systems tied to government entities, particularly when there is a lack of translated privacy policies or culturally sensitive guidance. Further, contemporary immigration policies create a fear of data misuse, which discourages LEP immigrants from using telehealth or digital portals.[87]
- For native speakers who are low-literacy, specific disabilities might be a factor in their struggles and must be identified and addressed intentionally. Also worth consideration is that these individuals may become frustrated trying to interpret language that is above their level, requiring simplified English and images for better engagement.

Language barriers also play a significant role in shaping digital exclusion. Millions of Americans, particularly immigrants and refugees, face difficulties navigating English-dominated online spaces. Essential websites, government services, and educational materials are often unavailable in their native language, and even when translation is available, it may be incomplete or inaccurate. For non-English speakers, the fear of miscommunication, surveillance, or being defrauded in unfamiliar systems can lead to complete withdrawal from digital engagement. Moreover, many tech support services, tutorials, and subsidy applications are available only in English, further deepening the gap without the necessary assistance. For low-literacy English only speakers, their issues might be more pronounced and rooted in other factors, such as a condition like Dyslexia. Prescriptive programming, including more face-to-face instruction might be required to reach these people.

7. Racial and Ethnic Minorities

Profile: This group includes Black or African American, Hispanic or Latino, Native American or Alaska Native, Asian American, Native Hawaiian and Pacific Islander, and multiracial populations. Together, these communities make up about 40% of the U.S. population, with unique cultural identities, histories, and experiences shaped by their rich national history but tempered by assimilation or systemic inequality.[88] While technology use among racial and ethnic minorities has grown significantly over the past decade, disparities in broadband access, device ownership, digital skills, and trust in online systems remain persistent.

Common Obstacles:

[87] Monika Doshi, (2022, February 10). *Barriers to health care services among US-based undocumented Latinx immigrants within the sociopolitical climate under the Trump administration: A comparative analysis between client experiences and provider perceptions.* SSM - Qualitative Research in Health. https://www.sciencedirect.com/science/article/pii/S2667321522000129

[88] https://www.prb.org/usdata/indicator/race-ethnicounty/snapshot/

- Black and Hispanic households are more likely to report that cost is the primary reason they do not have home internet, even when service is available. According to Pew Research, 21% of Hispanic adults and 18% of Black adults do not use broadband at home, compared to 12% of White adults.[89]
- Pew Research also states that roughly 35% of Hispanic and 30% of Black adults are smartphone-dependent, restricting their ability to apply for jobs, complete coursework, or attend telehealth appointments.
- Legacy redlining, education segregation, and discriminatory infrastructure investment have resulted in lower broadband availability in historically Black and Hispanic neighborhoods. Even today, fiber deployment rates are lower in low-income and majority-minority census tracts.[90]
- To add, communities of color often reside in areas where digital skills programs are underfunded or absent. Structural disparities in school funding, library systems, and workforce training mean fewer opportunities to build digital competence individually and across generations.
- Due to systemic surveillance and data misuse, many people of color approach digital platforms with skepticism regarding privacy, security, and bias. Concerns about algorithmic discrimination in employment, policing, and healthcare can discourage engagement with technology-based services.
- Black, Latino, Native, and Asian American communities may encounter content that is not culturally relevant, offered only in English, or lacking context necessary for accessibility, creating a sense of exclusion from digital spaces.

Data shows that racial and ethnic minorities, particularly Black, Hispanic, and Native American communities, are also overrepresented among the digitally unconnected. These populations are more likely to lack home broadband, more likely to rely on smartphones for access, and more likely to experience algorithmic bias or discrimination online. These disparities reflect decades of underinvestment in infrastructure, education, and economic opportunity in communities of color. Even when access exists, trust in digital institutions may be low due to a long history of surveillance, exclusion, and unequal treatment. It is important to note that this specific group has a large overlap with other covered populations.

8. Rural Inhabitants

Profile: Individuals and households located in rural areas (often defined as communities outside of metropolitan statistical areas with low population density and limited proximity to urban centers). As of the most recent U.S. Census data, approximately 46 million people (about 14% of the U.S. population) live in rural areas. While rural residents are diverse in age, income, and occupation, they share common challenges in accessing reliable broadband infrastructure, affordable service, and digital training resources. Many of these difficulties stem from geographic challenges or lack of population density, making it less desirable for internet providers to deploy infrastructure to these areas without subsidies or other incentives. The infrastructure gap is compounded by affordability constraints, aging populations, and fewer local institutions offering digital training or technical support.

Common Obstacles:

[89] Perrin, A. (2025, April 24). Home broadband adoption, computer ownership vary by race, ethnicounty in the U.S. *Pew Research Center*. https://www.pewresearch.org/short-reads/2021/07/16/home-broadband-adoption-computer-ownership-vary-by-race-ethnicounty-in-the-u-s/

[90] *Dollars to megabits, you may be paying 400 times as much as your neighbor for internet service – the markup*. (2022, October 19). https://themarkup.org/still-loading/2022/10/19/dollars-to-megabits-you-may-be-paying-400-times-as-much-as-your-neighbor-for-internet-service

- Rural areas are significantly underserved in fiber and high-speed cable infrastructure. Even where service is reported as "available," actual performance can be inconsistent or degraded due to aging copper lines or oversubscription of fixed wireless towers.
- Fewer providers mean higher monthly internet bills, installation fees, and limited plan options. A 2023 report found that rural customers pay more for comparable service than their urban counterparts due to lack of significant and direct competition.[91]
- Households in rural communities are less likely to own laptops, tablets, or desktop computers, limiting their ability to access telehealth, remote learning, and job training. According to Pew Research, only 70% of rural adults report owning a desktop or laptop, compared to 77-81% in urban/suburban areas.[92]
- Rural residents may lack access to adult education centers, libraries, or other institutions that offer digital skills training. In many communities, the nearest computer lab or digital literacy program is located miles away, posing a barrier for those without reliable transportation. Hospitals and universities in more rural areas also may have access to less resources than their urban counterparts.
- Rural areas tend to have older populations, and older adults are less likely to have been exposed to digital technology in school or work settings.
- Beyond internet use, rural areas often have weak cellular coverage, leading to less access to mobile broadband, telehealth check-ins, and emergency alerts or location-based services.

Finally, rural inhabitants face perhaps the most widely acknowledged digital inequity: the lack of broadband infrastructure. In many low-density regions, particularly in Tribal lands and remote farming communities, the high cost of deploying infrastructure makes high-speed internet unavailable or prohibitively expensive. Without competitive service providers, rural consumers often face higher prices for slower service, with few options to change providers or seek support. Mobile service also is frequently limited in these areas, creating true broadband deserts. Many rural communities in Virginia have heavy tree coverage, are in mountain ridges, or simply are just far from middle mile fiber, making it difficult for ISPs to deploy wireline services. While many states have initiatives that fund more deployment of high-speed broadband to rural communities (such as the Virginia Telecommunications initiative), these rollouts are gradual and still encounter issues in execution. Additionally, rural areas and their service infrastructure (hospitals, libraries, schools, etc.) may have less funding to prioritize digital services and rely on older infrastructure in general.

Note: this designation is broad, and rather than examine by census tract in the Section 4 analysis, the entire county receives this designation per NTIA guidelines. As such, the considerations made above are translated directly into Section 5 proposed implementation projects, bypassing the need for Section 4 maps by census tract.

[91] Whitacre, B. (2023, December 1). Research and analysis: Rural internet subscribers pay more, new data confirms. *The Daily Yonder*. https://dailyyonder.com/research-and-analysis-rural-internet-subscribers-pay-more-new-data-confirms/2023/11/28/

[92] *There's still a Digital Gap in America, and it's to do with where you live*. World Economic Forum. (n.d.-b). https://www.weforum.org/stories/2017/05/theres-still-a-digital-gap-in-america-and-its-to-do-with-where-you-live/#:~:text=Rural%20adults%20also%20are%20less%20likely%20to,of%20urban%20adults%20and%2042%25%20of%20suburban

2.4 Digital Opportunity for All

While federal and state digital equity initiatives have made meaningful strides in identifying key populations at risk of digital exclusion, there remains a growing segment of individuals who fall outside the scope of these traditionally recognized groups. These individuals, while not formally classified under the NTIA's Digital Equity Act as covered populations (and thus not considered in this plan) face substantial and often compounding disadvantages. Without deliberate effort, they risk being overlooked in the nation's drive toward universal digital opportunity.

This broader population includes transitional-age youth aging out of foster care, survivors of domestic violence and human trafficking, single parents and unpaid caregivers, individuals experiencing housing instability, gig economy workers, and people recovering from substance use disorders. What unites many of these groups is not a shared demographic profile but rather a set of intersecting life circumstances: unstable housing, limited institutional support, trauma, and other systemic issues that in some form translates into a lack of reliable access to digital infrastructure. These circumstances shape their digital vulnerability in ways that are no less urgent than those faced by traditionally covered populations. What ties all these groups together is the reality that digital inequity is not solely determined by age, income, geography, or race. And because many of these individuals are not formally counted in federal surveys like the American Community Survey or NTIA's covered population definition, they remain digitally invisible, unrepresented in the very data that drives resource allocation. To truly close the digital divide, digital opportunity planning must be expanded to include these "unseen" populations. This requires embracing flexible program design, such as allowing self-attestation for subsidy eligibility, developing mobile-first and low-bandwidth tools, and investing in digital outreach through shelters, food banks, mobile health clinics, and reentry centers. It also demands trauma-informed instruction, anonymous access to training, culturally and situationally responsive curricula, and a shift away from rigid eligibility criteria toward human-centered service models.

Moreover, digital risks such as misinformation, data privacy threats, and algorithmic bias are universal. These challenges influence how individuals find employment, access healthcare, receive financial services, and engage with the justice system. These days, algorithmic decisions in credit scoring, hiring, and predictive policing increasingly affect people across demographic boundaries, making digital literacy and awareness a shared civic responsibility.[93]

Ultimately, building digital equity for all means recognizing that exclusion is not always obvious or easily categorized. It means listening to voices at the fringes of society, designing with empathy, and resisting the tendency to treat solutions as a checklist. Digital opportunity must be broad enough to meet people where they are. It must be treated as a public need, similar to clean water or transportation. It supports economic inclusion, social mobility, informed citizenship, and public health. While digital equity programs rightly focus on covered populations, they must also acknowledge that society-at-large benefits when everyone is digitally connected, skilled, and secure.

[93] *Wang, X., Wu, Y. C., Ji, X., & Fu, H. (2024). Algorithmic discrimination: examining its types and regulatory measures with emphasis on US legal practices. Frontiers in Artificial Intelligence, 7. https://doi.org/10.3389/frai.2024.1320277*

SECTION

03

DEMYSTIFYING BROADBAND

3.1 Overview of Broadband Technology

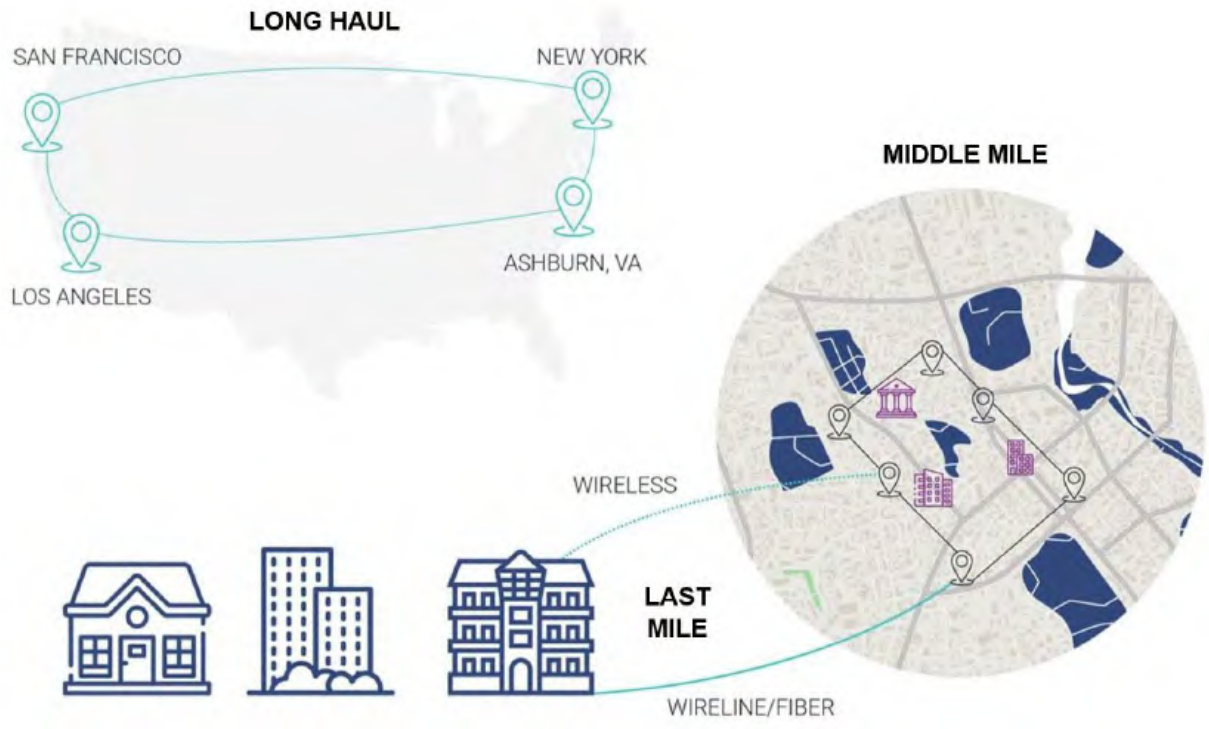
This section serves as an introduction and reference point for readers to become familiar with the language of broadband. [94] It presents commonly used terms, explains them in straightforward, accessible language, and includes examples where helpful. It also examines fiber optic as the gold standard technology for most broadband investments and an analysis of the current changes to NTIA's BEAD program and its potential impacts.

Readers who already feel confident in their understanding of broadband terminology may choose to skip parts of this section and move on to the rest of the content.

3.1.1 Physical Infrastructure and Delivery

The terms *Long Haul*, *Middle Mile*, and *Last Mile* describe the essential segments of a broadband network. Just as a supply chain moves goods from a central distribution center to a retail store or residence, these network segments deliver digital content to and from homes, businesses, and Community Anchor Institutions (CAIs). Whether using wired or wireless technologies, long haul, middle mile, and last mile connections each play a distinct role in ensuring data reaches its destination efficiently.

Figure 1: Network Types



[94] Parts of this section are adapted from a series of *2023 Rural Broadband Feasibility Studies* Broadband Telecom Services served as the co-author for, adapted for the current state of the industry.

Long Haul

Long haul infrastructure is often likened to a cross-country railway system - built for moving massive volumes over long distances with speed and efficiency. This part of the network carries data across great physical spans, linking major metropolitan areas or even crossing international borders. Long haul routes typically rely on buried fiber optic lines stretching hundreds or thousands of miles, including the vast undersea cables that span oceans.

These long haul fiber networks form the global backbone of the internet and telephone systems, handling the bulk of national and international data traffic. They usually connect key internet exchange points (IXPs) in large urban hubs such as Chicago, Atlanta, Boston, Phoenix, Houston, and Washington, D.C. On a broader scale, these continental networks tie into international routes via undersea cable landing sites along both the Atlantic and Pacific coastlines. For example, multiple transoceanic cables make landfall along the Mathews shore and the Oregon coast, linking the U.S. with Europe, Asia, and beyond.

Long haul networks are designed for enormous capacity, utilizing high fiber strand counts and the most advanced transmission technologies available. While these routes often pass through small towns and rural areas on their way from one major node to another, they're typically not accessible to the communities they pass through. This is largely due to the network's architecture and the business models of the companies that operate them, which prioritize point-to-point transport rather than local connectivity.

Middle Mile

Middle mile networks can be thought of as regional versions of long haul systems, bridging the gap between large national backbones and local community networks. They span distances between cities, towns, and regional connection hubs - acting as the infrastructure that ties together smaller communities and connects them to broader networks. While middle mile networks occasionally serve large institutions like universities, libraries, or medical centers directly, they typically do not reach into neighborhoods or small business districts.

Using the transportation metaphor, middle mile infrastructure functions like a state highway or major arterial road, facilitating efficient travel across regions but stopping short of individual driveways. Fiber-based middle mile can come in two forms: *lit* fiber, where the provider delivers managed transmission services, and *dark* fiber, which allows organizations to lease physical strands and install their own equipment to manage data flow. This flexibility gives last mile providers, whether small ISPs, electric cooperatives, or municipal networks, the ability to either buy bandwidth as a service or manage the network infrastructure themselves, depending on their technical and financial capacity.

Importantly, proximity matters - the closer a middle mile connection point is to a target service area, the less last mile infrastructure is needed. This proximity lowers deployment costs and accelerates broadband expansion, especially in areas previously underserved. As new middle mile networks are built, they often become key enablers for last mile projects by reducing the financial and logistical burden of building out remote connections.

One example of this approach is North Carolina's statewide middle mile expansion, which aims to deploy thousands of miles of underground fiber across every county. The infrastructure will be made available for use by locally led broadband projects, including those supported by state and federal grants. These networks will enable last mile providers to tap into the system and route data to internet exchange points in places like Atlanta or Chicago, where the traffic can transition to long haul networks for national and international transit. Southside Virgina is constructing their own middle-mile network, known as the Regional Connectivity Ring (RCR), detailed more in the next section.

Last Mile

Last mile networks provide the essential final link connecting homes, small businesses, local government offices, and other community anchor institutions to the broader internet. These networks interface with middle mile infrastructure - such as a

state-operated regional network - which then connects to long haul networks that transport data across states, countries, or even continents. Continuing the road network analogy, last mile infrastructure functions like neighborhood streets, branching off from larger roads to reach individual destinations. The segment that physically connects a last mile network to a specific building is called a *service drop* or *line extension*, similar to a driveway connecting a house to the main road.

Last mile delivery can be accomplished through wireline or wireless technologies, but the most effective and future-proof method is often considered *fiber to the premises* (FTTP). In this model, each home or business receives a dedicated fiber connection that runs directly to the building. FTTP infrastructure can be installed aerially on existing utility poles or buried underground. While underground installation carries higher upfront costs, it offers greater long-term resilience by shielding fiber from many common hazards. Buried fiber is protected from damage caused by weather events like windstorms and ice accumulation, as well as accidents such as falling trees or vehicles colliding with utility poles - making it a more reliable option for communities seeking durable, high-performance broadband access.

3.1.2 Speed and Performance

Bandwidth refers to the capacity of a broadband or telecommunications network to transmit data, much like the number of lanes on a highway determines how many vehicles can pass through at once. Internet speeds are measured in bits per second (bps), which reflect how much data can travel across a connection each second. In earlier days of internet access, bandwidth was commonly measured in kilobits per second (Kbps), a unit used to describe the speed of dial-up modems and still relevant for devices like fax machines (generally *bits* denote data transmission rate, while *bytes* [a group of eight bits] denote data storage). Today, bandwidth is more commonly measured in Megabits per second (Mbps) and Gigabits per second (Gbps), with each step up representing a 1,000-fold increase in speed: 1 Gbps is 1,000 times faster than 1 Mbps, and 1 Mbps is 1,000 times faster than 1 Kbps.

However, raw speed is not the only factor that determines the quality of an internet connection. Latency, the time it takes for data to travel from one point to another, plays a critical role in user experience. High latency, or delay, often results from bottlenecks in the network. For instance, if a last mile provider connects to a middle mile network that lacks adequate capacity, or if the middle mile itself is poorly connected to a long haul backbone, a traffic jam can occur. This forces data to pause, be buffered, or in some cases, be dropped entirely. Even if a connection is advertised as “high speed,” high latency during peak usage times can slow actual performance significantly.

In addition to latency, network congestion can lead to jitter - a disruption in the timing of data packet delivery. When packets arrive out of order or need to be retransmitted due to congestion, it can affect time-sensitive applications. For example, jitter may appear as pixelated streaming video, lagging audio in video calls, or delays in gaming and other real-time services. These interruptions can degrade performance even when the connection speed appears adequate.

If we compare these concepts to plumbing, bandwidth is the *size of the pipe*, dictating how much liquid you can pass through, and latency is the *speed of the liquid*, which depends on the type of liquid, but also the distance between the starting and end points. To ensure consistent performance, internet service providers (ISPs) and network operators must maintain well-sized connections throughout the network, not only at the last mile level but also at key middle mile and long haul interconnection points. Just as a well-planned transportation network includes wide interchanges and sufficient on-ramps, a broadband network must be built with enough capacity and redundancy to support high volumes of data, especially during times of heavy use.

FCC Definition

The Federal Communications Commission (FCC) used to define broadband as internet service with a minimum speed of 25 Mbps or downloads and 3 Mbps for uploads, commonly written as 25/3 Mbps. In 2024, they officially acknowledged an increase in this standard, moving the definition of broadband up to 100/20 Mbps. Download speed refers to the rate at which data is received from the internet, such as streaming YouTube videos, browsing websites, or checking email. Upload speed is the rate at which data is sent to the internet, like when emailing files, participating in video calls, or posting content to social media platforms like Instagram.

The widespread adoption of video conferencing tools such as Zoom, Microsoft Teams, Google Meet, and FaceTime has highlighted a growing demand for faster upload speeds, particularly for households with multiple users or those working and learning remotely. Inadequate upload speeds can lead to poor video quality, delays, or dropped connections - affecting everything from professional meetings to virtual classrooms.

Under current FCC guidelines, any location with speeds below 100/20 Mbps is officially classified as unserved. Some institutions, such as the NTIA, have an additional metric between 100/20 and 25/3 which is classified as underserved. Many industry experts and digital equity advocates argued for this change in the 25/3 Mbps benchmark as it was outdated and failed to reflect the connectivity needs of modern technology, cloud-based services, and evolving user expectations. Prior to that, 10/1 Mbps was the threshold for unserved. This shows that as applications grow more data-intensive and reliant on real-time interaction, there will always be increasing pressure to revise the federal broadband standard to more accurately support the digital demands of tomorrow. It is worth noting that in an FCC policy revision drafted in 2024, the previous FCC chair Jessica Rosenworcel proposed to update the definition of broadband to the "long-term speed goal" of 1000/500 Mbps, which would affect funding program eligibility and would shift the industry's idea of capable broadband service. This, among many other potential changes, is subject to vote in early August 2025, but is currently facing backlash by the current FCC chair, Brendan Carr, due to being "unreasonably prejudicial to technologies such as satellite and fixed wireless that presently do not support such speeds".[95]

Infrastructure Investment and Jobs Act

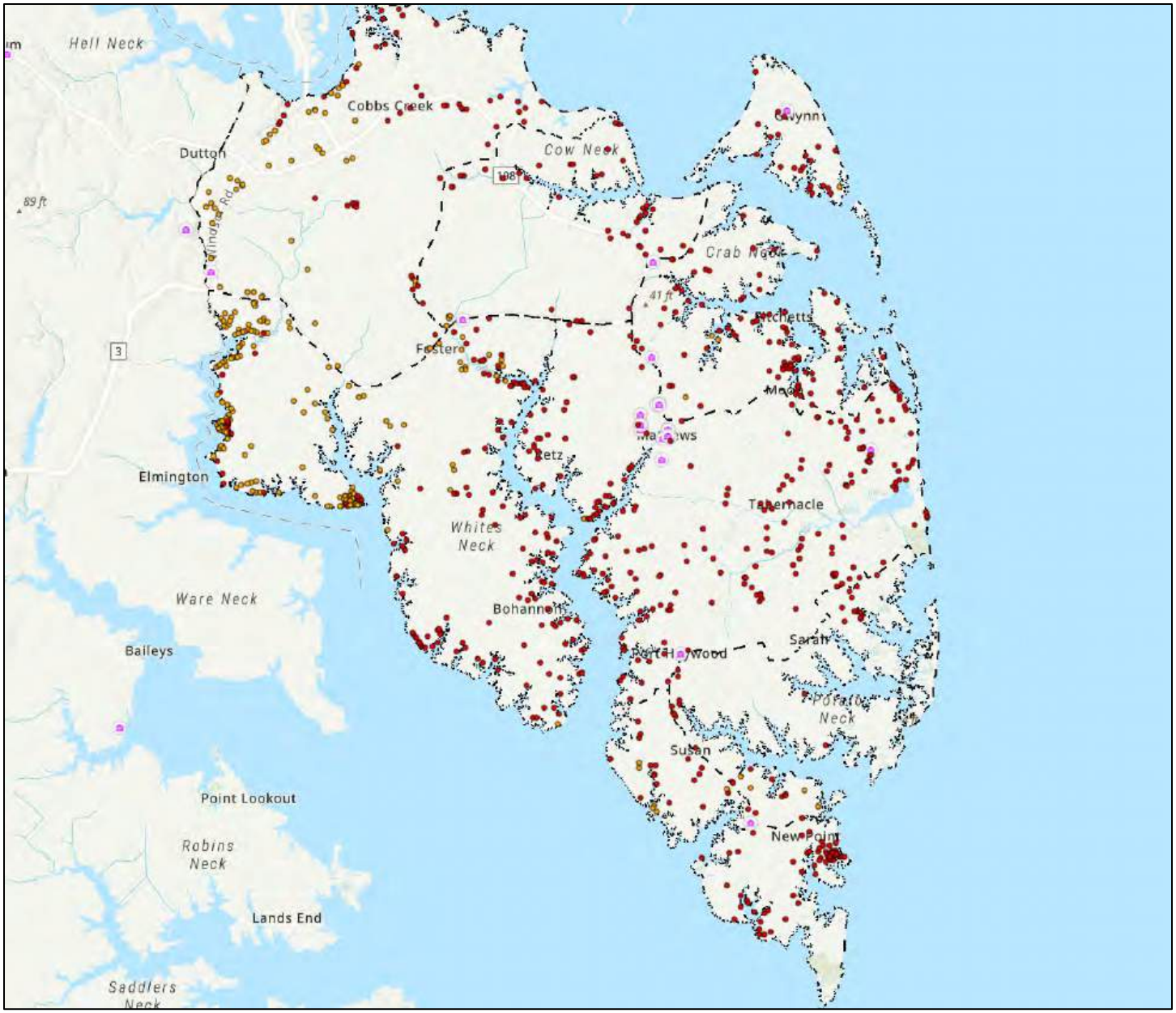
The Infrastructure Investment and Jobs Act (IIJA) of 2021 set aside unparalleled funding for broadband and digital equity deployment. As part of this legislation, the IIJA added the classification of underserved, in addition to unserved. The Broadband Equity, Access, and Deployment (BEAD) program, established in the IIJA, defines the two as follows:

- Unserved are those locations without any service offerings at or above 25/3 Mbps
- Underserved are those locations with 25/3 Mbps but less than 100/20 Mbps

Figure 2 illustrates the areas of Mathews County that are unserved, underserved, as well as unserved community anchors.

[95] Brodkin, J., & Brodkin, J. (2025, July 21). FCC to eliminate gigabit speed goal and scrap analysis of broadband prices. *Ars Technica*. https://arstechnica.com/tech-policy/2025/07/fcc-to-eliminate-gigabit-speed-goal-and-scrap-analysis-of-broadband-prices/

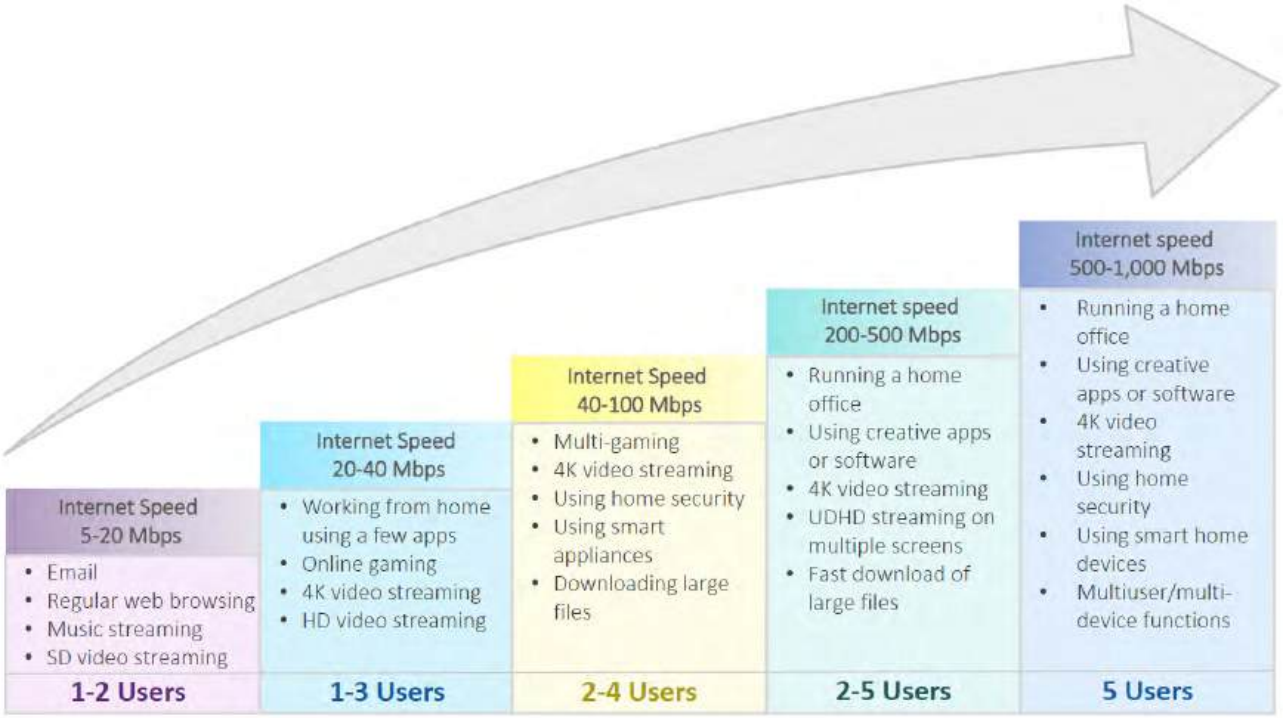
Figure 2: Unserved Community Anchors (Pink) , Underserved (Orange), and Unserved (Red) Locations in Mathews



Most of the county is classified as having speeds of more than 100/20 Mbps available.

For the remaining, this is significant, as the IIJA and BEAD program recognize the need to scale data consumption to meet future connectivity needs. The IIJA dictates that any networks constructed with funding from the BEAD program must be capable of delivering speeds of at least 100/20 Mbps to end-users to account for ever-growing capacity demands and prioritizes the funding future-scalable last mile networks.

Figure 3: Estimated Home Service Speeds Needed per Number of Users[96]



3.2 Broadband Technologies

3.2.1 Wired and Wireless

There are several technologies used to deliver internet access to homes and businesses, which generally fall into two main categories: wired and wireless. Each category includes multiple variations, but at the core, the distinction lies in how the data is transmitted. Wired connections use physical infrastructure - such as copper cables or fiber optic lines - to carry information. Wireless connections, on the other hand, transmit data through electromagnetic signals in the air.

This section provides a high-level overview of the most common wired and wireless technologies in use today, offering a foundational understanding of how internet service is delivered.

[96] All Connect, "Frequently Asked Questions on Internet Speeds: What Are Mbps and How Many Do I Need?," https://www.allconnect.com/blog/faqs-internet-speeds-what-speed-do-you-need, accessed August 2023.

Wired Technologies

- Digital Subscriber Line

Digital Subscriber Line (DSL) delivers internet service using copper telephone lines composed of twisted pairs of thin copper wires. In many areas, this infrastructure is several decades old and approaching the end of its functional life. Many providers have already been decommissioning these networks. DSL performance is highly sensitive to distance - the further a subscriber is from the Digital Subscriber Line Access Multiplexer (DSLAM), the more the signal degrades, resulting in slower speeds and reduced reliability.

Copper wiring, also used by fax machines and dial-up modems, was never originally designed for high-speed internet traffic. While DSL is technically capable of delivering speeds above the 25/3 Mbps outdated broadband threshold, it rarely exceeds 100/20 Mbps in residential settings. The actual speed and reliability depend on several factors, including the age of the infrastructure, the quality of the customer premises equipment, and, most critically, distance from the network equipment. These limitations are often more pronounced in rural areas, where customers are typically farther from central telecom facilities and where the copper network may be older and less maintained.

Because DSL struggles to consistently deliver speeds of 100/20 Mbps and lacks the ability to scale to meet future bandwidth needs, many broadband infrastructure funding programs, such as those authorized under the IIJA, exclude DSL from eligibility for investment. As a result, this technology is no longer seen as a viable long-term solution for delivering reliable, high-speed internet, particularly in underserved areas.

Reflecting this shift, major ISPs like AT&T are actively phasing out DSL service. As of October 1, 2023, AT&T no longer accepts new DSL subscribers, though existing customers may continue using their service. In many areas, AT&T has begun offering fixed wireless access as a replacement, utilizing its mobile network infrastructure. Many other providers are following suit. However, as the costs of maintaining aging copper systems continue to rise (especially those installed in the 20th century), providers are increasingly transitioning away from DSL in favor of fiber-optic deployments where feasible, to meet current and future connectivity demands.

- Cable

Cable internet typically refers to broadband delivered over coaxial cable, which consists of a copper core surrounded by insulating material and a conductive shield. This type of cabling is usually installed on utility poles or buried along public rights-of-way (ROW), then extended into individual buildings. The infrastructure used for cable internet service is the same as that originally built to deliver cable television to homes.

Cable television systems were initially designed for one-way signal transmission, sending content from a central satellite headend down to subscribers. To support internet service, these networks had to be reengineered for two-way communication, enabling data to flow both upstream and downstream. While coaxial cable is a functional medium for broadband, it experiences greater resistance and signal degradation over distance compared to fiber optic cables.

Most modern cable systems use a Hybrid Fiber-Coaxial (HFC) architecture. In HFC systems, fiber carries data to nodes located deep within neighborhoods, where the signal then transitions to coaxial cable for the final leg to the customer. To support growing demand and deliver higher speeds, cable providers must push fiber closer to end users than in earlier designs. When the fiber is placed sufficiently close, HFC systems can achieve download speeds of 1 Gbps or more.

However, one of the key limitations of cable internet is its asymmetrical performance. While download speeds can be quite high, upload speeds lag behind, often falling short of what fiber systems can offer. This limitation makes cable less ideal for modern applications that require robust upstream bandwidth, such as video conferencing, cloud backups, or content creation.

Cable networks rely on a series of transmission electronics, located at multiple nodes between the data center and the customer, to modulate and manage the flow of data. These systems operate using defined standards that allow different frequencies to be used more efficiently to pack more data into the network. The most widely deployed standards today are DOCSIS 3.0 and DOCSIS 3.1 (Data Over Cable Service Interface Specification), which can deliver gigabit-level download speeds but continue to allocate most of the available bandwidth to downloads rather than uploads.

The upcoming DOCSIS 4.0 standard is designed to significantly improve upload speeds by reallocating more capacity to upstream traffic. However, adopting DOCSIS 4.0 will require substantial upgrades to network equipment across large portions of existing cable systems. Until these upgrades are widely implemented, asymmetrical performance will remain a defining characteristic , and limitation, of most cable broadband services.

- Fiber Optics

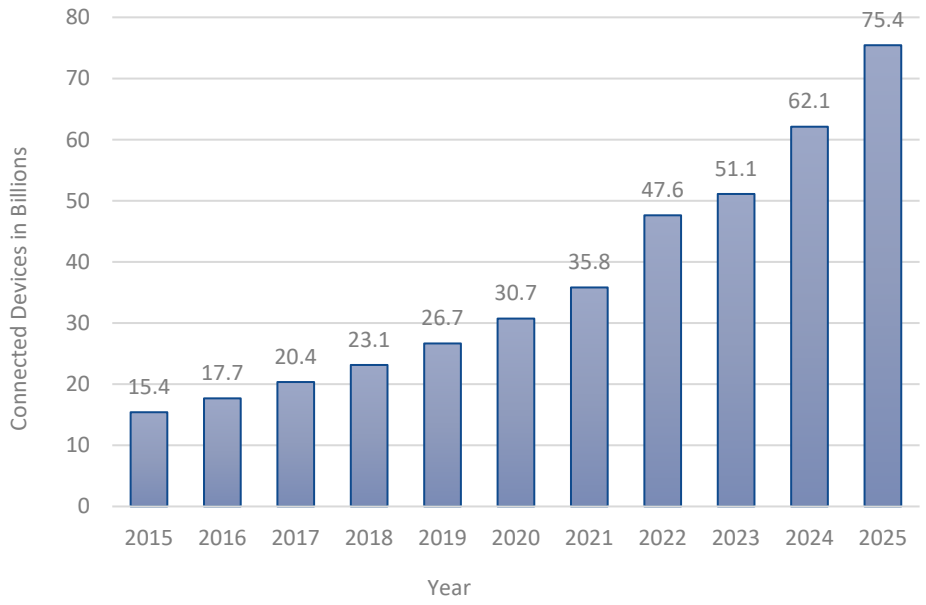
Fiber optic cables are composed of ultra-thin strands of glass about the diameter of a human hair, that transmit data as pulses of light. These light signals are then converted to electrical signals by network equipment at either end of the connection. Fiber is widely regarded as the gold standard of broadband technology because of its vast speed and data capacity. Its limitations are not in the cable itself, but in the performance of the electronic equipment used to send and interpret the light signals. Fiber networks are capable of scaling to multi-gigabit or even terabit-level speeds, making them ideally suited for both current and future connectivity needs.

At the global level, the internet's foundational infrastructure is built on fiber optic subsea cables and long-haul terrestrial routes, which collectively move hundreds of terabits of data per second between cities, countries, and continents. While fiber has been used for decades in backbone and enterprise networks, residential fiber deployment was rare until recent years. Today, as fiber-based middle mile networks expand and the cost of fiber components continues to drop, Fiber to the Premises (FTTP) is increasingly being pursued as the preferred solution for delivering high-speed internet to homes and small businesses.

Fiber has a significant advantage in terms of longevity and reliability. The cable itself has an expected lifespan of 50 years or more, often requiring little to no maintenance. Unlike copper, fiber does not corrode and is immune to electromagnetic interference, making it well-suited for both aerial and underground installation. Providers favor FTTP not only for its performance, but also for its low long-term operational costs, since only the network electronics need periodic upgrades to meet growing bandwidth demands.

Most FTTP networks use a system known as Passive Optical Networking (PON). In a typical PON setup, a single strand of fiber is connected to a high-capacity port of 10 Gbps or more at the service provider's local hub (form their central office, usually a local facility that has access to the internet), such as a cabinet or fiber hut. This fiber is then routed into a neighborhood and split, using passive optical splitters that require no power or active electronics, into 32 or 64 individual fiber strands, each serving a separate home or premises. This shared architecture significantly reduces the cost of fiber deployment by minimizing the number of strands needed and reducing labor during installation, while still delivering high-speed service to every connected location.

Figure 4: Number of Devices Estimated to be Connected to the Internet[97]



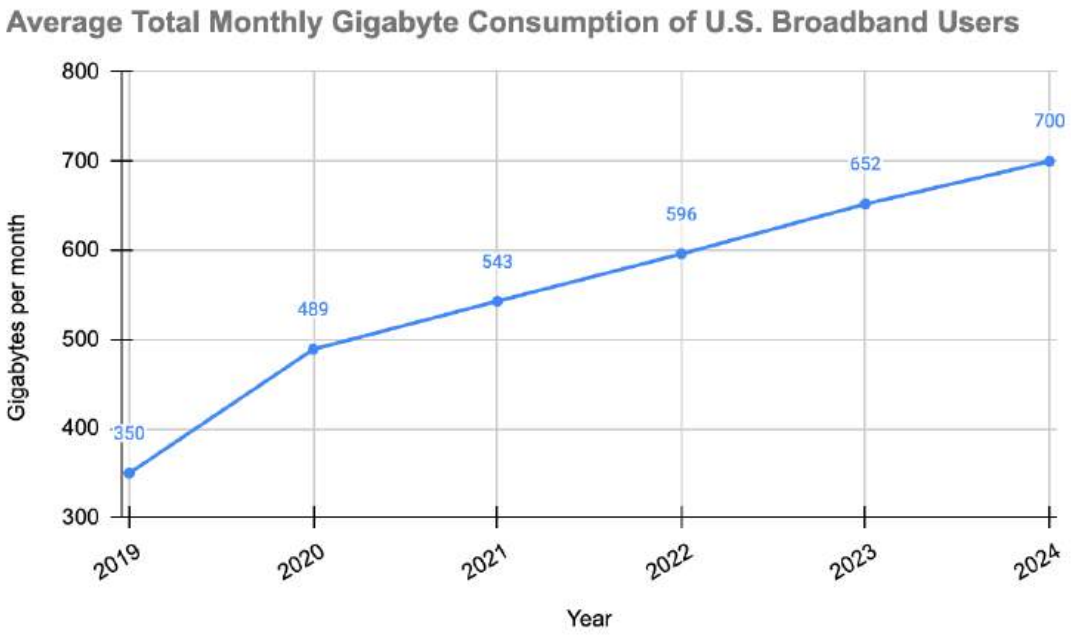
As illustrated in Figure 4, the growing number of connected devices and the rising demand for digital services continue to drive the need for greater bandwidth and faster internet speeds. Unsurprisingly, broadband infrastructure must be capable of scaling to keep up with this exponential growth. This trend has led to increased investment and interest in scalable technologies - most notably FTTP - which are well-equipped to support long-term increases in data consumption. As a result, federal and state broadband funding programs have been largely centered on expanding access to fiber and similarly scalable solutions for homes, businesses, and community anchor institutions.

In densely populated areas, FTTP and advanced hybrid fiber-coaxial (HFC) systems have already seen widespread deployment. In these markets, households are showing rapidly rising usage patterns that reflect increasing digital dependence. By the end of 2022, the average U.S. household consumed nearly 600 gigabytes (GB) of data per month, a sharp increase from 462 GB in early 2021, and more than double the 270 GB monthly average recorded at the end of 2018.[98] This dramatic rise highlights the critical importance of future-ready broadband networks that can adapt to evolving demands without significant reinvestment in physical infrastructure.

[97] IOT device statistics between 2015-2025. (n.d.-b). https://www.researchgate.net/figure/oT-device-statistics-between-2015-2025_fig1_343597097

[98] OPENVAULT, LLC. (2024). *Broadband Insights Report (OVBI) 4Q23*. https://openvault.com/wp-content/uploads/2024/02/OVBI_4Q23_Report_v3.pdf

Figure 5: Average Monthly Broadband Consumption per Household[99]



Wireless Technologies

Wireless broadband operates similarly to wired broadband in function but differs in delivery, transmitting data through the air via a connection between equipment mounted on a tower or antenna and the end user's home or business. Wireless services include a range of technologies such as mobile (cellular) broadband, fixed wireless access, and community or campus-wide Wi-Fi networks.

Performance in wireless networks can vary significantly based on several factors, including the type and quality of the equipment used, the strength of the provider's middle mile connection, the number of users sharing the network, and the physical distance or obstructions between the user and the transmitting tower. Environmental conditions, such as heavy rain, snow, or dense foliage, can also degrade signal strength and overall network reliability.

Compared to technologies like Fiber to the Premises (FTTP) or cable, wireless last mile networks are typically less expensive and much faster to deploy, making them preferred for rapid coverage in rural or underserved areas. However, they tend to deliver lower speeds, reduced reliability, and greater variability in performance, especially under conditions of network congestion or poor line-of-sight to the tower.

■ Fixed Wireless

Fixed wireless networks are point-to-multipoint systems that transmit broadband service from a central location, such as a tower or tall structure, to multiple fixed endpoints, like homes or businesses within a neighborhood. These networks are called "fixed" because the receiving equipment, known as a subscriber module (SM), is permanently mounted to a building's exterior,

[99] *The average internet data usage per month (Updated 2025)*. (2025, April 3). Astound. https://www.astound.com/learn/internet/average-internet-data-usage/

such as the sidewall or eaves of a home. Unlike cellular networks, which serve mobile users, fixed wireless is designed to deliver broadband to stationary locations.

Typically, a fiber connection (often sourced from a middle mile network) is extended to a vertical asset such as a tower, utility pole, or rooftop. This connection feeds a wireless access point (AP) that transmits data to multiple SMs, forming a wireless link that provides internet access to each connected household or business.

The performance of fixed wireless systems depends in part on the spectrum being used. Unlicensed spectrum, which is more commonly used due to its accessibility, typically requires a clear line-of-sight (LoS) between the AP and the SM. These systems operate at lower transmit power and can be obstructed by terrain, trees, and buildings. In contrast, licensed spectrum, which is more expensive and requires regulatory approval, allows for higher transmit power and may enable signals to penetrate through light vegetation or structures, depending on the frequency band and environmental conditions.

Fixed wireless technology is also being used as a backhaul solution for hybrid network deployments. For example, providers may install fiber to a cluster of homes in a remote area and then use a multi-gigabit wireless backhaul link to connect that cluster to the broader network via another tower. This strategy is particularly valuable in regions where laying fiber for long distances is cost prohibitive. While this approach does come with some trade-offs, such as potential weather interference, line-of-sight challenges, and limited redundancy, it offers a cost-effective and scalable option for extending modern broadband to difficult-to-reach communities.

■ Wi-Fi Networks

Wi-Fi networks are widely used in homes and businesses to create local wireless connectivity for internet-enabled devices. These networks work by converting a wired or wireless internet signal - delivered to the building - into a Wi-Fi signal that devices such as smartphones, tablets, laptops, and smart home equipment can access. Wi-Fi is especially convenient because most consumer devices come equipped with built-in Wi-Fi radios, allowing users to connect to the internet without physical cables. Wi-Fi generally lets users access a Local Area Network (LAN) without wires. WANs (Wide Area Networks) usually extend much greater geographic distances than just a household.

Wi-Fi networks can range in scale from a single room or building to larger deployments that cover entire campuses or county blocks, depending on the strength and configuration of the equipment. In homes and small businesses, Wi-Fi is typically managed through a router or access point connected to the internet service provider's network (LAN). In larger settings, like universities or municipal districts, multiple access points are often deployed and coordinated to ensure seamless coverage across wide areas (WAN).

■ Satellite Technologies

Satellite broadband provides internet connectivity via satellites orbiting the Earth, rather than through traditional ground-based infrastructure like fiber, cable, or cellular towers. Unlike fixed wireless, which relies on networks of terrestrial antennas usually fed by a fiber line, satellite service connects users by transmitting data to and from a dish installed at the user's home or business to in-orbit satellites at different heights in Earth's atmosphere. These satellites are either in geostationary orbit (GEO), hovering over a fixed point on Earth approximately 22,000 miles above the equator, or in low Earth orbit (LEO), which operates between 300 and 1,200 miles above Earth and requires a constellation of satellites to maintain consistent coverage. The satellite then relays this signal to a ground-based network operations center (NOC) that links into the broader internet.

Providers like HughesNet and Viasat rely on geostationary satellites, which offer broad coverage but suffer from high latency due to the long signal travel distance. This delay can make real-time applications such as video conferencing, online gaming, or remote desktop work difficult. More recently, companies like SpaceX's Starlink or Amazon's Kuiper have introduced low Earth orbit satellite constellations, dramatically reducing latency and improving throughput. These LEO systems aim to deliver

service that more closely mirrors the responsiveness of terrestrial broadband. Unlike fixed wireless or mobile cellular technologies, satellite broadband can reach virtually any location with a clear view of the sky, making it a vital option for remote and isolated communities.

However, similar to other solutions, satellite broadband faces limitations in bandwidth and scalability. Congestion during peak usage hours, data caps, and weather-related disruptions can all impair service quality. In the context of federal and state broadband funding programs, satellite service generally not considered eligible technology for location eligibility or proposed service, due to these drawbacks. However, LEO services are being prioritized for rural deployments, especially as it pertains to the BEAD program, where there is a big emphasis on accepting this technology as the cheapest solution, even to the point of carving out special considerations. Recognizing this discrepancy, many broadband policymakers now distinguish between satellite service types when evaluating service levels and eligibility for investment. While satellite broadband can provide critical baseline connectivity, especially in hard-to-reach areas, it is often considered a last resort when more scalable wireline or fixed wireless solutions are not feasible.

- Mobile & 5G

Mobile wireless, commonly referred to as cellular service, enables users to maintain an internet connection while moving across wide geographic areas—offering far more flexibility than typical Wi-Fi networks. Mobile wireless APs are installed on towers or other elevated structures and positioned close enough together to allow users to move seamlessly between them. When a person travels on foot or in a vehicle, their connection is automatically handed off from one AP to the next without any noticeable interruption. Common mobile wireless devices include smartphones, tablets, and portable hotspots, all of which use a cellular radio, distinct from the Wi-Fi radios built into most consumer electronics.

In recent years, major mobile carriers like Verizon, T-Mobile, and AT&T have expanded their services to include home internet offerings based on their existing mobile networks. These fixed wireless services use the same licensed spectrum and tower-based infrastructure as their mobile offerings. Customers are provided with a radio and antenna SM, which can be mounted on the home's exterior or placed inside near a window for optimal signal reception. This type of service can be an important stopgap solution for households that currently lack access to any other form of internet connectivity.

However, while mobile-based fixed wireless can offer vital service in the short term, its presence can sometimes create challenges for securing grant funding intended to support higher-capacity, wireline deployments like FTTP or coaxial cable. Some funding programs view areas served by mobile wireless as already having coverage, which can disqualify them from eligibility for infrastructure upgrades, even if the mobile service lacks the capacity and reliability of wireline solutions.

The current generation of mobile wireless technology is known as 5G, short for fifth-generation connectivity. 5G offers faster speeds, lower latency, and greater capacity than its predecessor, 4G, and can be used for both mobile and fixed wireless applications. Hardware manufacturers build devices to meet standardized 4G and 5G specifications to ensure broad compatibility across networks. Prior to the COVID-19 pandemic, 5G was often promoted as a universal broadband solution. However, in the post-pandemic broadband funding landscape, federal and state programs have largely excluded mobile and cellular technologies from eligibility for infrastructure grants aimed at connecting homes, businesses, and CAIs. These programs now emphasize scalable, high-capacity wireline technologies to meet long-term connectivity goals.

3.2.2 Why-Fiber?

Fiber optic broadband is widely regarded as the superior long-term investment for internet infrastructure due to its unmatched performance, durability, and scalability. Unlike legacy technologies such as copper (used in DSL and coaxial cable) or wireless systems that rely on radio signals, fiber transmits data using light through ultra-thin strands of glass. Through this medium,

data is transferred at 'the-speed-of-light' making speeds bottlenecked by the equipment that is using fiber to communicate. Subsea cables that send hundreds of Terabits of data per second use fiber optic lines that span whole oceans. Since the infrastructure that is in the ground does not have to be replaced but 2 to 3 times in 100 years, and providers can upgrade equipment at their central offices and customer homes, this technology is the gold standard for 'future-conscious' connectivity.

Advantages:

i. Fiber offers virtually unlimited bandwidth and speed potential. This means that as consumer and business demand for data continues to grow, fiber networks can scale up simply by upgrading equipment - without the need to replace the fiber lines themselves.

ii. Fiber is extremely reliable. It is immune to electromagnetic interference, weather conditions, and degradation from age that commonly affect copper-based and cable systems.[100] When buried underground, lines are resistant to outages caused by storms, fires, or accidents involving utility poles. This resilience results in lower maintenance costs and fewer service disruptions over time.

iii. From an economic perspective, fiber has a lower total cost of ownership than other wired infrastructure. While the initial construction costs can be higher than those of fixed wireless or hybrid coaxial systems, fiber networks have a lifespan of 30 to 50 years or more, require minimal upkeep, and avoid the need for costly, frequent technology replacements. This makes fiber the most cost-effective solution over the long term.[101]

iv. Additionally, public funding programs generally weigh fiber deployments as higher because of their scalability and ability to meet evolving federal benchmarks, such as 100/20 Mbps service or higher. Investments in fiber support not just current broadband needs, but also future use cases as mentioned in this document, like telehealth, remote education, smart applications, and precision agriculture, which demand high-capacity, low-latency networks. It is also necessary to support long distance fixed wireless and satellite solutions, serving as the foundational connection for their bandwidth.

Fiber optic networks offer performance, longevity, and upgrade flexibility required for sustainable, forward-looking broadband infrastructure. As such, they are the most prudent technology investment for communities, providers, and private investors seeking to build networks that will stand the test of time (former chairman of the FCC, Ajit Pai agrees with this sentiment).[102] While it might not make sense to build to every least-served, remote household - where it can be invested, is should.

3.3 Broadband Barriers and Challenges

Barriers to broadband adoption can be physical, social, or economic in nature. Physical barriers often involve high costs associated with building infrastructure across difficult terrain, such as mountainous regions, dense forests, or sparsely populated rural areas. Meanwhile, social and economic barriers can limit people's ability to afford service or fully engage with it - these include factors like low income, limited digital literacy, and language access challenges. Regardless of the type, these

[100] Lindenphotonics. (2024, September 9). *Comparing the durability of fiber optic and copper cables - Linden Photonics Inc*. Linden Photonics Inc. https://www.lindenphotonics.com/comparing-the-durability-of-fiber-optic-and-copper-cables

[101] *7-Advantages-of-fiber-optic-cables-over-copper-cables*. (n.d.). Eaton. https://www.eaton.com/us/en-us/products/data-video-cables-accessories/fiber-network-cables/7-advantages-of-fiber-optic-cables-over-copper-cables.html

[102] Neenan, J. (2025, February 12). *Fiber is a good Long-Term bet, says former FCC chairman Pai*. Broadband Breakfast. https://broadbandbreakfast.com/fiber-is-a-good-long-term-bet-says-former-fcc-chairman-pai/

barriers significantly complicate efforts to expand broadband access, particularly for rural communities, lower-income households, individuals with limited English proficiency, and regions where geographic conditions increase the difficulty and cost of deployment.

Physical Barriers

Broadband planning often begins with a careful assessment of the geographic and environmental conditions surrounding a proposed network deployment area. When fiber is installed underground, it typically requires trenching or directional drilling, both of which involve specialized equipment and significant labor. Fiber is usually buried 24 to 48 inches below the surface, though in some regions, such as parts of Virginia, it may be placed even deeper to safeguard the infrastructure against natural disasters, including flooding and severe storms.

In areas where conditions permit, aerial fiber installation using existing utility poles can offer a more cost-effective alternative to underground deployment. However, this approach can present challenges in rural areas, where poles are often older and may not be structurally sound enough to bear the added weight of fiber optic cables. Additionally, aging poles may not meet current cable height or spacing regulations, especially when new lines are added alongside existing infrastructure. In such cases, the replacement of utility poles becomes necessary, significantly increasing project costs and timelines.

Figure 6: Physical Barriers to Broadband Development

State and federal rules require many infrastructure projects to submit an Environmental Impact Statement. Common environmental and historic preservation considerations affecting network deployment include:

- Wetlands, bodies of water, rivers, streams, and irrigation ditches must be protected to maintain animal habitats and preserve water sources. These features can create challenges when deploying broadband infrastructure through areas with many waterways. Working with state and local agencies to adhere to regulations during the planning phase can help minimize these challenges.

- Historic preservation is important to maintain the character and heritage of a community. However, encountering historic artifacts, buildings, and other items of significance during deployment can delay projects. Broadband planning efforts should engage with the Virginia Office of Historic Resources (OHR) and the Tribal Historic Preservation Office as needed, to manage any potential issues.

Social and Economic Barriers

Equally as important to the development of broadband infrastructure are the social and economic barriers preventing service adoption. These barriers can be as challenging to overcome as physical obstacles, and include unaffordable service,

unaffordable or inadequate devices, and insufficient digital skills. Despite this, ISPs, local governments, and nonprofit organizations can help communities overcome these challenges by developing deployment and digital opportunity strategies with the following factors in mind:

- In rural areas with low population density, private ISPs typically have a difficult time recouping the cost of network deployment. This lack of return on investment, or ROI, can limit private ISPs' desire and ability to invest in such areas. Additionally, if a network is constructed, the ISP may be forced to charge customers higher subscription rates to offset these higher deployment costs. Local funding, state grants, and federal grants can help provide the additional resources needed for private ISPs to enter these low-density markets, which then reduces the need to charge higher prices to recoup the full cost of the deployment. As a result, these deployment subsidies can help to keep service offerings more affordable.
- Communities with a low median income typically subscribe to broadband service at lower frequency than their higher-income counterparts. This can impact an ISP's willingness to invest in an area due to concern about take rate (the number of customers who will subscribe to their services). Even in areas where adequate service is available, it may not be priced at rates affordable to low-income residents. Enrollment in internet subsidy programs can help offset this burden.

3.3.1 Technologies, Benefits, and Barriers Recap

High-speed broadband access plays a critical role in fostering productivity, innovation, and economic competitiveness. The demand for broadband continues to grow, driven by evolving user behaviors, the rapid adoption of new technologies, and transformative events such as the COVID-19 pandemic. As these needs expand, county leaders and stakeholders must remain aware of the shifting digital landscape - along with the opportunities and challenges it presents. Federal investments in broadband infrastructure represent a strategic window of opportunity for municipalities to harness improved technology and deliver faster, more reliable service to residents and businesses. These funding programs, however, come with strict eligibility and compliance requirements, making it essential for local governments to understand how to navigate them effectively.

For the Mathews County, the Broadband Equity, Access, and Deployment (BEAD) Program is a particularly promising opportunity. With approximately $1.48 billion allocated to broadband expansion in Virginia, and revised program structures designed to promote inclusive participation, BEAD offers a chance for Mathews to close physical infrastructure gaps and enable digital access and opportunity to all of its residences.

An informed understanding of the range of wired and wireless broadband technologies is essential to developing an effective local connectivity strategy. This section has outlined key considerations across both delivery models, and how they impact economic development and operational efficiency. Ultimately, the shift toward fiber-optic networks is a critical part of this transition. Fiber offers the scalability needed to support growing bandwidth demands, fueled by the increasing number of connected devices and data-intensive applications used by households and businesses alike.

The benefits of broadband are far-reaching and have become even more pronounced in a post-pandemic world. High-speed connectivity enhances government efficiency, public safety coordination, and civic engagement, enabling more responsive services and broader participation. In transportation, broadband underpins smart mobility efforts, supporting electric vehicle charging networks, real-time traffic management, and transit system optimization. For utilities, broadband enables real-time monitoring, improves compliance tracking, and helps reduce operational costs through automation.

Broadband is also a powerful driver of economic development. It allows local businesses to expand their reach online and is crucial for attracting and retaining employers in sectors like logistics, advanced manufacturing, and remote professional

services. At the residential level, broadband is a digital lifeline. It provides access to online learning and empowers households to pursue higher income opportunities through remote work or entrepreneurship. Telehealth has similarly become essential, especially in rural areas where access to healthcare facilities is limited.

To fully realize these benefits, local governments must actively engage in overcoming the barriers to broadband adoption. These include physical challenges, such as rugged terrain, environmental constraints, and infrastructure costs, as well as social and economic obstacles, like affordability gaps, lack of digital literacy, and limited access in low-income or rural areas. Private ISPs are often reluctant to invest in these communities, making public funding and government involvement essential. Moreover, communities with lower median incomes frequently face higher service costs relative to their ability to pay, while residents may lack the digital skills needed to fully benefit from the service once it is available.

Encouragingly, well-designed policies and funding initiatives can address many of these issues. However, one lingering challenge is the accuracy of broadband availability data. Many rural counties continue to struggle with incomplete or outdated broadband maps, compounded by the reluctance of some ISPs to share precise information about service availability, cost, and speed. Even though there have been strides made since 2022, accurate representation is a moving target.

Prior to the pandemic, broadband expansion was largely left to a patchwork of private providers and small-scale programs. But the events of 2020 laid bare what rural and underserved communities have long known: the digital divide is real and growing. Without local leadership and coordinated intervention, these gaps will continue to widen. The current funding environment offers a unique and urgent opportunity for communities like Mathews to bridge this divide and lay the groundwork for long-term digital success.

3.4 NTIA's BEAD Funding and the Current State of the Program

When initially passed, the BEAD Program, created under the IIJA of 2021, represented the largest single federal investment for broadband infrastructure in U.S. history. With $42.45 billion allocated to expand high-speed internet across the nation, BEAD promised a generational opportunity to close the digital divide, particularly for the least served communities, including "cherry-picked" residences, rural communities, low-income households, and other disadvantaged populations. Since its inception, the program has evolved through extensive planning phases, public engagement, and federal oversight. However, recent developments in June 2025 introduced sweeping changes that have reshaped its implementation and future trajectory, shifting away from what some perceive as the original intent of the program.

Originally, the Biden Administration was set to spend $100 billion for a federally driven process, but that eventually evolved into less than half of that sum, with most of the administration driven by state broadband offices. That incarnation of the BEAD Program officially began with the signing of the IIJA on November 15, 2021. Soon after, all 56 eligible entities - including every U.S. state, territory, and the District of Columbia - submitted Letters of Intent, laying the groundwork for their Five-Year Action Plans. Throughout 2022 and 2023, states began crafting their Initial Proposals, aligning with the Notice of Funding Opportunity (NOFO) issued by the NTIA. By June 30, 2023, NTIA officially released BEAD funding allocations to each state, setting the stage for the next phase: challenge processes and provider selection.

Concurrently, BEAD ushered in a new standard of broadband availability mapping, which was a prerequisite for allocating funding to each eligible entity. Previously, broadband availability was mapped using the FCC From 477 standard, where internet providers would annually declare the areas they served by submitting household counts by census block. This practice was controversial because while data was publicly available, it obscured broadband availability by marking any

census block who had at least one valid connection as 'served'. So, if one household in a census block containing 500 had broadband service of 25/3 Mbps, while the remaining 499 households had less than 5/1 Mbps, that whole block was denoted as having suitable service.[103] This had a direct impact on eligibility for broadband funding opportunities which would prioritize census blocks that were not 'served' by these criteria, which would result in many households continuing to wait for service, as federal and state subsidies were the only way providers could justify building to some areas with a low anticipated rate-of-return.

BEAD required the updating of this standard before any money could be allocated. Congress instructed the FCC to develop a new mapping standard called the 'Broadband Data Collection' (BDC) map, which was in conjunction with the location data firm CostQuest Associates. This ushered in a new era of broadband reporting. The biggest factor was moving from the overrepresentation of census blocks to individual, point based locations (when referred to as a whole, is called the 'fabric'). These individual points represent 'broadband serviceable locations' (or BSLs), which consists of residential households, multi-dwelling units, businesses, or any other commercial property that could justify needing access to a broadband connection (a farmhouse, potentially). Governmental buildings and other important infrastructure that also may fit the criteria are denoted as a CAI, or 'community anchor institution'. As much as this definition is an art rather than a science, the real problem became clear when the FCC had to conduct this work as quickly as possible in order to move the program along. With service definitions tied to these structures rather than whole areas, many ISPs who had to adapt to this new process by the first filing deadline simply applied their census block definitions to this new point fabric, retaining much of the same inaccuracy as the previous standard (albeit updated for changes in service in the year). Additionally, CostQuest had to rush to publish the first round of fabric points in order to give providers enough time to file and used algorithm-based methods to identify structures with not much time for quality control, resulting in millions of missing structures (normally obstructed by tree coverage), incorrect addresses and locations, and overall inaccurate and incomplete datasets. The public map portal launched in November 2022, where residents could experience this disconnect for themselves.

Acknowledging these drawbacks, the FCC and NTIA decided to wait until Version 2 to determine state allocations in order to more accurately count unserved and underserved households. BDC is updated every six months, so there were six months of provider and FCC-side refinements to make these more accurate. Still, there were systemic issues, but funding allocations were made in order to move the BEAD process along. Overall, the percentage of locations in need in a state, out of all locations in need nationwide, was used to determine how much money each state was allocated. Of the $42.5 billion, Virginia received $1.48 billion - the sixth highest total.

As states proceeded to define their specific approaches to BEAD through their Initial Proposals Volume I and II, the NTIA realized that more mapping refinement was needed in order to further remove inaccuracies, as most states had data that could help further this initiative. Over the course of 2023 and early 2024, states conducted broadband coverage 'challenge processes' to validate which other locations were eligible for BEAD-funded service by 'crowdsourcing' the input process through spreading a call to action. This let residents who might be misrepresented on the map have their voices heard by submitting three location-based speed tests. These efforts were aimed at refining broadband maps and ensuring that funds would reach the truly unserved and underserved. By early 2025, most states had received NTIA approval of their Initial Proposals and had begun the application process for providers to bid on their desired project areas. Virginia ended 2024 by opening the first round of this application process, then in early 2025 conducted a follow-up round to receive proposals for any BSL not initially applied for. Virginia's Office of Broadband was optimistic at the beginning of this process that their allocation would be able to go all the way – connecting every single Virginia BSL in need of 100/20 Mbps service, with enough money to fund priority fiber connections that were below $25,000 cost per BSL passed and then give relevant other

[103] These phenomena can also be referred to as a "skunk at a garden party".

technologies the remaining locations. Initially, Virginia planned to conclude this process and announce awards by the end of May 2025, with the Final Proposal going to the NTIA on June 25, 2025.

However, on June 6, 2025, the NTIA, under the direction of the new Secretary of Commerce, issued a policy notice that dramatically altered the program's implementation. In response to growing concerns about cost-efficiency and speed-to-deployment, NTIA introduced a major restructuring designed to improve how subgrantees are selected and how broadband is delivered. Known informally as the "Benefit-of-the-Bargain" update, this policy requires all states to rescind any previously issued provisional awards and conduct a new round of competitive bidding that prioritizes cost per location above all other factors. The main implications of this were the removal of many of the compliance requirements that applicants had to adhere to, such as workforce and climate resiliency policies, as well as a stricter form of technology neutrality: any broadband technology that can reliably deliver minimum speeds of 100 Mbps download and 20 Mbps upload with low latency is now eligible to compete for priority BEAD funding. This opens the door to more fixed wireless, hybrid fiber-coaxial, and even satellite-based proposals, provided they meet performance benchmarks. Previously, fiber projects, especially those that claimed higher speed availability were scored higher than other proposals. Now, other evaluation criteria, such as deployment speed, existing provisional awards, or technology type, are secondary and only considered if they fall within a 15% margin of the lowest bid.

In addition, NTIA suspended the use of BEAD funds for non-deployment activities such as workforce development, digital literacy, and telehealth expansion. It also revised the definition and eligibility of CAIs and imposed more rigorous conditions on unlicensed fixed wireless solutions, effectively narrowing the path for certain providers to participate without meeting new latency and reliability standards. Due to the timeline of these activities, this project was still able to be completed; subsequent programs such as digital capacity grants - which would have served to implement the programs advised later in this document - were removed from the future of BEAD.

As a result of these sweeping changes, all states were given a 90-day window from June 6 to September 4, 2025, to reopen their subgrantee selection processes, update their datasets to remove homes served by unlicensed fixed wireless providers who met the speed requirements, submit a redefined set of CAIS, and reissue competitive solicitations. States like Virginia acted quickly, reopening letters of intent and launching 'Benefit of the Bargain' (BotB) bidding by late June, with negotiation and public comment periods running into August. North Carolina revised its prequalification process and released updated broadband service data, while Connecticut and others published newly eligible location maps and adjusted application deadlines. In contrast, larger states such as California, paused their prior activities to fully reassess program timelines and compliance with the new federal requirements. Every other eligible entity is racing to comply with the updated timeline.

In the short term, the restructuring has introduced uncertainty, particularly for providers and communities that had already invested in the initial application and planning phases, as well as ISPs who were already provisionally awarded from the first application process. However, NTIA maintains that this recalibration is necessary to ensure that the BEAD Program delivers the greatest possible value per taxpayer dollar and reaches every eligible location with minimal waste or favoritism. To their credit, they aim to have all revamped plans approved and funds released to providers by the end of 2025 in order to start projects. On the other hand, the overall shift in strategy may be seen as less effective at creating a lasting investment. The main criticism of BEAD, which was passed in 2021, was that it did not result in any shovels in the ground almost five years later. However, most of this messaging missed what was stated earlier in this section about the shift in mapping standard that resulted in a more accurate picture of broadband availability to spend the funds more appropriately. And while this was not without issue, it was a shift that was years in the making. On the provider end, many smaller ISPs and even wireless ISPs (WISPs) felt intimidated by many of the compliance provisions in the guidance, especially concerning workforce stipulations. The states, who were no stranger to federal bureaucracy and drawn out processes, had coordinated significant proposal deliveries and signoffs with the NTIA to have the freedom in creating their own programs with specific provisions requiring adherence to the notice of funding opportunity to-the-tee. Now the same institutions, lobbyists, and critics that pushed for

more precise mapping and compliance rules in order to prevent competitive overbuild in areas with existing infrastructure, are the ones arguing that BEAD was doomed to fail because there was too much baked-in bureaucracy.[104] But this was even a compromise, as a lot of concessions were made from the original iteration of the program moving from being a completely federally administered fund akin to USDA ReConnect, to something driven by the states (albeit with federal compliance checks). While these may be valid concerns, there is an argument to be made that the largest broadband investment in the history of this country should be carefully administered in order to get it right. Adjusted for inflation, it was an even bigger funding allocation than the Rural Electrification Act of 1936.[105] The new rules that take the preference away from fiber also seem short sighted, as some states like Virginia were confident they could make investment in this future-facing technology where it made sense, and avoid having to reinvest in inferior technologies which would require another infrastructure overhaul as broadband use cases and bandwidth demand grow over time, especially with the advent of new, data intensive technologies such as AI. In fact, it is estimated that up to $33.5 billion out of the $42.5 billion could be unspent, due to the BotB round skewing favorable to the cheapest solution.[106] In many of these cases, satellite could be awarded for wherever they apply because of their ubiquitous presence and other special provisions detailed in the new policy notice, and the cost of their connection is miniscule in comparison to deploying a physical line or even erecting a new tower that can serve multiple BSLs at once.

Looking ahead, the BEAD Program is now entering its most pivotal chapter. With billions still unspent, and all prior awards effectively reset, states are retooling their strategies to deliver broadband. The coming months will determine whether the program can meet its ambitious goals or whether further adjustments and future funding will be necessary. What remains clear is that the stakes are high: the BEAD Program is not just about infrastructure - it is fundamentally about access for every American, regardless of zip code, income, or background. The outcomes of these mid-course corrections will reverberate for decades in how the country defines and delivers comprehensive digital inclusion to every American.

Regarding BEAD non-deployment – it is still up in the air. The Digital Equity Act and downstream programs, such as the one responsible for this plan, as well as the follow-up capacity grants that aimed to enact the projects herein, were definitively canceled on May 9th, 2025. Despite this, some members of congress have joined together to build a legal case against this cancellation and push for these funds and subsequent activities to be reinstated. BEAD non-deployment on the other hand, is tentatively suspended, with activities that fall under this category unable to be reimbursed federally. There is a high degree of overlap in permissible activities that can be funded by this program compared to DEA, so this may be a path forward to once again achieving federal support for these practices. Reassessing use cases of the Universal Service Fund (USF) and incorporating appropriations for covered populations beyond only low-income may open the door to continuous support of Digital Equity. All of these outcomes require vocal support and action from everyone, including state representatives, local leaders, and residents. The first step is awareness of these issues, then advocacy and demands to unfreeze non-deployment funding, reinstate, and reconfigure these programs that are meant to materially deliver to communities in need.

[104] Breaking Points. (2025, April 2). *Ezra Klein RIPPED for viral Jon Stewart claim* [Video]. YouTube. https://www.youtube.com/watch?v=Xi8IBAEpAd4

[105] Ali, C. (2025, June 10). *The legacy of the Rural Electrification Act and the promise of rural broadband*. LPE Project. https://lpeproject.org/blog/the-legacy-of-the-rural-electrification-act-and-the-promise-of-rural-broadband/

[106] Marx, C. (2025, June 26). *Study Finds that BEAD May Cost Billions Less than Expected*. Broadband Breakfast. https://broadbandbreakfast.com/study-finds-that-bead-may-cost-billions-less-than-expected/

SECTION

04

ASSET INVENTORY AND NEEDS ASSESSMENT

4.1 Mathews County Overview

4.1.1 Mathews County Demographic Profile

Mathews County, Virginia is a small, coastal locality located at the tip of the Middle Peninsula, known for its rural charm, maritime heritage, and tight-knit community. As of 2025, the county is home to an estimated 8,500 residents, making it one of the least populous counties in the Commonwealth. The median age is significantly higher than the state average, reflecting an aging population that continues to grow in proportion. Over one-third of residents are aged 60 or older, creating specific challenges in health care access, transportation, and digital engagement. This demographic tilt toward older adults also has implications for housing availability and service delivery.

Mathews County has a relatively homogenous population, with a majority identifying as White (non-Hispanic). Small percentages identify as Black or African American, and fewer than 2% identify as Hispanic or Latino. Less than 1% of residents are foreign-born, and nearly all are U.S. citizens. The population has remained relatively stable over the past decade, but with signs of gradual aging and a slight decline in working-age households. These shifts place increased pressure on the county's tax base, emergency services, and public health infrastructure.

Economically, the county skews lower-middle income, with a median household income estimated near $64,000 - below the state average but generally consistent with rural norms. Poverty affects approximately 10 - 12% of the population, and homeownership remains high, with the majority of residents owning their homes outright. The housing stock skews older, and much of it is located in flood-prone or geographically isolated areas, making infrastructure maintenance and emergency access more complicated. The labor force is largely distributed among education, health care, construction, and small-scale retail and marine industries. Commuting is heavily reliant on personal vehicles, and average commute times often exceed 30 minutes as many residents work in neighboring counties.

While high school graduation rates are consistently above 90%, only about 14% of residents hold a bachelor's degree or higher. The county's single public high school serves as both an educational institution and a community hub, with increasing interest in vocational training, technology pathways, and workforce readiness programs. As the county moves toward long-term planning, priorities include diversifying housing, expanding health and social services, and strengthening civic and digital infrastructure to meet the evolving needs of its residents.

4.1.2 Mathews County Technology Profile

Mathews County's progress toward digital inclusion is shaped by a decade-long push to overcome geographic and infrastructural challenges. Bounded by the Chesapeake Bay and crossed by tidal marshes and inlets, Mathews faces unique barriers to broadband expansion, particularly in delivering wired infrastructure to its most rural, flood-prone, and low-density areas. Recognizing these limitations early, county leaders established the Mathews Broadband Advisory Board (MBAB), a citizen-led body tasked with advising the Board of Supervisors on broadband strategy, community engagement, and provider coordination. The MBAB became a key driver of local efforts to expand high-speed internet access and ensure that connectivity was treated as a public necessity.

In collaboration with regional internet service providers and DHCD, Mathews County was awarded a VATI grant in 2020, totaling nearly $1 million in partnership with Atlantic Broadband (now Breezeline) and the counties of Middlesex, Lancaster, and Caroline. This project enabled the build-out of fiber-optic infrastructure to hundreds of previously unserved households. More recently, in 2022, the county supported Open Broadband's fixed wireless expansion, which added high-capacity wireless service via vertical assets, providing coverage to hard-to-reach residents in the North peninsula (named North, not in the *north*). These combined efforts have markedly increased the percentage of Mathews residents with access to broadband speeds meeting or exceeding the FCC's baseline. On top of these fixed deployments, Mathews also pursued the erection of two new 200 foot monopole towers, in partnership with their first responder facilities is Hudgins and Bohannon. These towers were recently completed and will host mobile broadband equipment to enhance coverage of 5G services.

The MBAB has remained active in guiding the county's broadband strategy, hosting community forums, issuing public surveys, and acting as a liaison between residents, ISPs, and government entities. Through its coordination, the county also promoted the Line Extension Customer Assistance Program (LECAP), which provides financial support for households facing high special construction costs for last-mile internet connections. Despite the gains from these programs, survey data and public feedback reveal that affordability and device access remain critical barriers. Even in areas where fiber or fixed wireless is technically available, the cost of monthly service or necessary equipment often prevents full adoption.

Public institutions have stepped up to fill the remaining gaps. The Mathews Memorial Library offers free public Wi-Fi and hotspot rentals, one-on-one tech help and digital literacy training, and computer access, while the public school system ensures high-speed internet to all students during school hours. During the pandemic, hotspot lending and drive-up Wi-Fi zones became essential lifelines for families without home connections. Mathews also partnered with Broadband Telecom to deploy 8 solar-powered smart poles in strategic locations across the county which used mobile carrier service to provide public Wi-Fi access. However, these efforts remain patchwork solutions without a unified countywide digital opportunity strategy or long-term support for digital literacy programming and device affordability.

Looking forward, Mathews County is poised to deepen its commitment to broadband access until it fulfills the mission of universal coverage. Virginia's BEAD program has been of great interest for Mathews to accomplish this goal and has resulted in partnerships with various carriers. With MBAB's backing, Mathews is becoming a rural leader and state-wide example to follow in vigorously pursuing its broadband goals.

4.1.3 Mathews County Other Priorities

The 2018 Mathews County Comprehensive Plan sets forth a clear vision for protecting the county's rural character while supporting equitable growth, environmental resilience, and the long-term wellbeing of all residents. Although the Plan does not explicitly use the term "equity," its chapters on housing, transportation, education, and community services highlight the importance of ensuring that all county residents regardless of age, ability, or income can access essential public resources and participate in community life. The plan notes that while Mathews remains a close-knit community with strong civic identity, it faces demographic, economic, and environmental pressures that necessitate a more inclusive, service-oriented approach to governance.

Figure 7: Mathews County Comprehensive Plan Quote

> *"With increasing opportunities for home-based occupations, telecommuting and distance learning, the County has a unique ability to draw, or employ, residents for small business development. Expanded services and close attention to integrating cutting-edge communication technology can enhance telecommunication opportunities and positively influence the community's economy and quality of life."*
>
> *– Mathews County 2030 Comprehensive Plan, 2018 (2022 Rev.), p. 102*

A number of key themes reflect the County's broader social priorities:

- Aging Population and Accessibility – With one of the oldest median ages in the Commonwealth, Mathews County places a significant emphasis on planning for aging-in-place. The Plan calls for improvements in accessible housing, expanded access to in-home care, and the integration of assistive services into the daily lives of seniors. This includes recommendations for expanding paratransit services, supporting independent living, and developing local health resources to minimize out-of-county trips for basic care. As digital health tools and virtual services become more standard, the lack of broadband access for some seniors presents an equity concern that intersects directly with these goals.
- Housing Preservation and Affordability – A central focus of the Plan is on preserving existing housing stock and ensuring that homes are safe, energy-efficient, and affordable for low-to-moderate income residents. Mathews' housing landscape is defined by older, single-family homes that are increasingly difficult to maintain, particularly for retirees and low-income residents. The Plan outlines a need for rehabilitation programs and targeted subsidies, which could be further strengthened by digital applications and grant portals that reduce the bureaucratic burden on applicants.
- Emergency Preparedness and Environmental Justice – Due to its low elevation and proximity to coastal waterways, Mathews faces significant risk from sea level rise, flooding, and extreme weather. The Plan prioritizes community-wide emergency preparedness, evacuation protocols, and real-time hazard communication systems, each of which can be greatly enhanced through improved digital infrastructure and broadband-reliant warning systems. Residents in vulnerable areas need equitable access to weather alerts, FEMA benefits portals, and virtual emergency planning resources.
- Education, Workforce, and Youth Services – The Comprehensive Plan highlights the importance of investing in the next generation through quality education and local workforce development. It calls for increased collaboration with Mathews County Public Schools, Rappahannock Community College, and area employers to provide career and technical education (CTE) pathways for youth. However, consistent with recent digital equity survey findings, limited broadband access can make remote learning and online job training inaccessible for lower-income and least-served families. Supporting CTE and workforce pipelines must include direct digital support for these households.
- Public Health and Service Coordination – Residents have long reported challenges in accessing health care without traveling outside the county. While Mathews County is served by facilities such as the Mathews Gloucester Care Clinic and the Three Rivers Health District, the Plan recommends improving coordination of services and exploring

local satellite facilities, particularly for mental health, addiction treatment, and elder care. These objectives align closely with potential digital equity strategies such as establishing public telehealth access points and navigator support to guide residents through insurance and service portals.

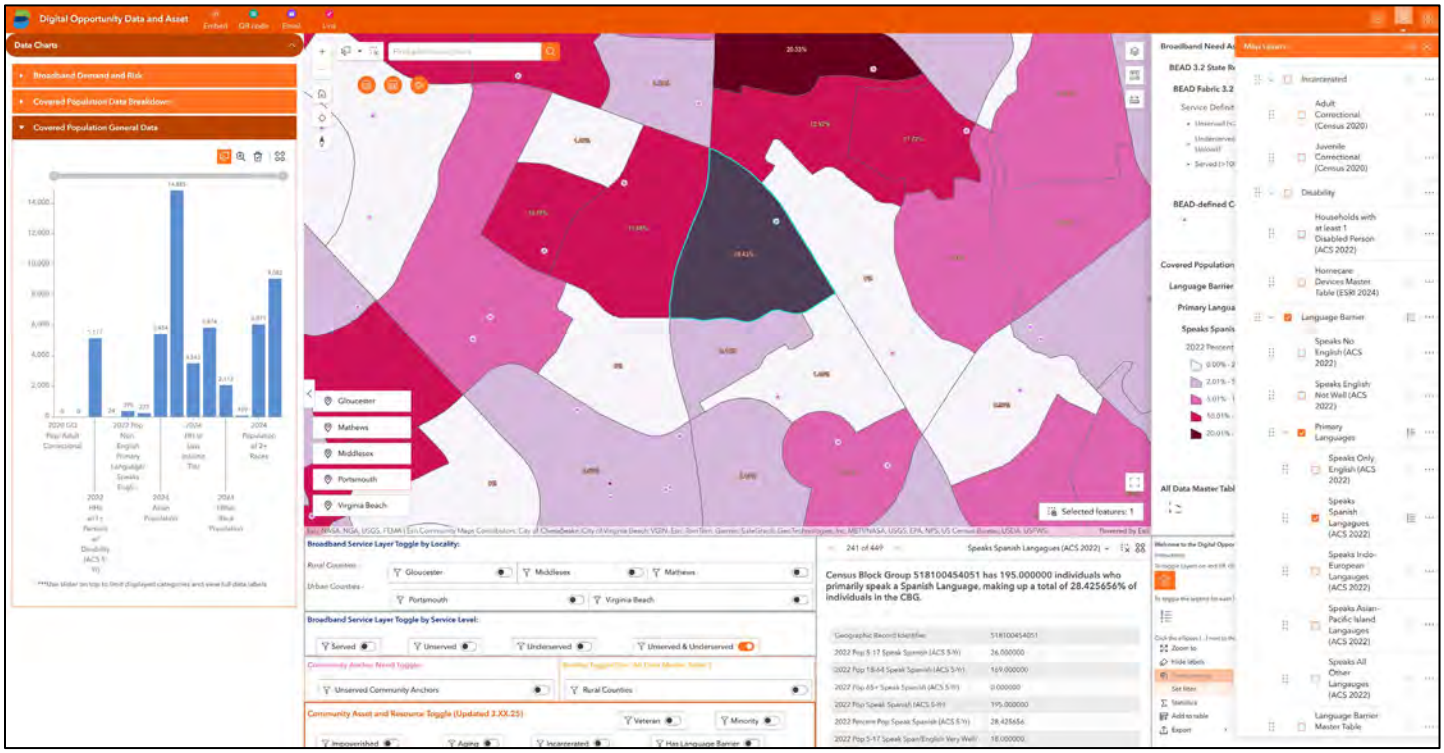
Since 2018, the County has taken steps to improve service access and community resilience. Despite its small size, Mathews is proactively engaging partners and seeking outside funding to address longstanding disparities and modernize its infrastructure for long-term sustainability. As the County advances its long-range planning goals through the 2030 horizon, digital opportunity can no longer be treated as a standalone issue. Rather, it is an enabling force that will determine the success of nearly every other service priority, from housing to emergency response to public health and community safety.

4.2 General Broadband Needs Assessment

This section aims to look at the current state of broadband access, as well as examine the spread and levels of covered populations in the Mathews County. To assist in this effort, the Digital Opportunity Viewer[107] was created to provide an interactive experience for both residents and community partners. This viewer contains data for every locality that engaged Broadband Telecom Services to create this plan, including Mathews, Mathews, Mathews, Mathews, and Mathews. This viewer contains multiple datasets from various sources, including the U.S Census Bureau 2020 data, ACS 5-Year 2020 data, and ESRI 2024 data (which is declared next to each layer name). A discussion on the differences between these sources is at the end of this section. This tool will be incrementally updated to reflect more current data as well as available community assets as they are identified. Many maps and charts used in this analysis will be taken from this tool down to the Census Tract. A guide to navigate this tool is also available linked through the tool.

[107] https://experience.arcgis.com/experience/42b60755f1c84353b5a6016b89a65fa2/

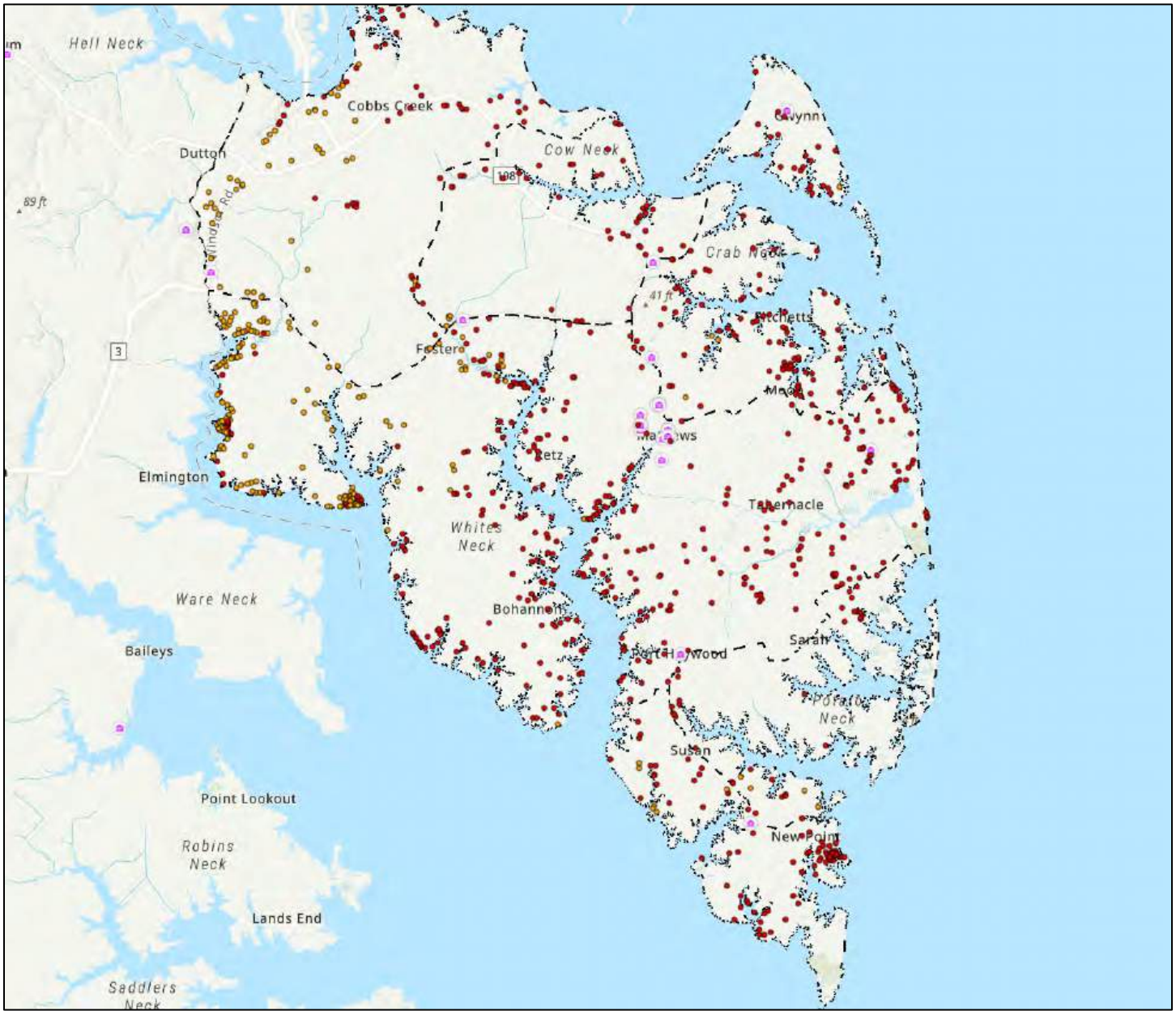
Figure 8: Digital Opportunity Viewer Screenshot (Showing layer selection and data charts)



4.2.1 Current Broadband Environment

In Mathews, as well as communities across the country, gaps in broadband availability remain a significant barrier to equity, particularly for historically underserved neighborhoods and institutions. This section presents a spatial overview of the county's BSLs according to the BDC fabric version 3.2, which was used for Virginia's BEAD program eligibility. BSLs are categorized by their service status of served, underserved, and unserved, alongside the placement of key community anchor institutions such as libraries, schools, and healthcare facilities. Understanding where infrastructure exists and where it falls short is essential to identifying the areas and populations most in need of targeted investment. Figure 9 offers a visual snapshot of broadband access across Mathews, helping to guide future planning, funding priorities, and policy interventions.

Figure 9: Broadband Need In Mathews (BDC V3.2)



This map depicts V3.2 data, while the tables below show V6 data from the most recent release. V3.2 data was used as the basis for BEAD eligibility in Virginia, so these locations, while potentially served in V6, are likely to see a level of investment through the program. Specifically, these locations may obtain new fiber and cable infrastructure. Notice, The least served areas of the county tends to be located along the shoreline (which Mathews has a great deal of), and inland pockets near forested or wetland geographies.

Ultimately, some factors come into play when examining the digital devices, such as the demographics of the area. The Return on Investment (ROI), for deploying service to widely dispersed households and communities with low population densities is generally longer than 5–10-year average ROI, and this is especially difficult when communities have a low assumed "take-rate" or likelihood of subscription. Because of the geography of the area, both wireless and wireline systems have been difficult to navigate, with dense forest cover, dispersed housing, old infrastructure, and traversal through wetlands and coastal soils,

the main factors that drive up build costs. Despite this, an examination of the most current BEAD 'negotiation round' datasets indicate that many of the locations in the northern half of the county may receive some kind of updated solution, being cable, fiber , or capable fixed wireless, but the peninsula east of Mathews Point may still take longer to receive a suitable solution.

Table 1: Households Lacking Terrestrial Broadband Service across Mathews County (BDC V6)

Broadband-Serviceable Households	Amount	Percent	Notes
Total number of locations (BSLs)	6.2k	100%	Defined by FCC address fabric
BSLs lacking any 25/3 Mbps service	0.5k	8.87%	BEAD-defined "unserved"
BSLs with 25/3 Mbps but not 100/20 Mbps	0.2k	3.37%	BEAD-defined "underserved"
BSLs with 100/20 Mbps but not 1000/100 Mbps	5.4k	85.7%	BEAD-defined "served"
BSLs with 1000/100 Mbps service or greater	0.1k	2.08%	Highest performing HFC, fiber, 5G, PTP

This table, according to latest v6.0 BDC data, shows that the county only has 15% of its residences not served by broadband over 100/20 Mbps, the NTIA's minimum speed for this designation. The highest tier of 1000/100 Mbps usually denotes cable HFC, or fiber service, which constitutes a miniscule portion of the county.

Table 2: Broadband Data Collection December 31, 2024, Availability by Technology

Broadband-Serviceable	25/3 Mbps	100/20 Mbps	250/25 Mbps	1000/100 Mbps
Any Technology	100%	99.9%	71.52%	29.24%
Copper	0.0%	0.0%	0.0%	0.0%
Cable	80.33%	80.33%	59.1%	0.0%
Fiber	4.23%	4.23%	2.08%	2.08%
Any Satellite	100%	100%	0.0%	0.0%
Unlicensed Fixed Wireless	14.5%	4.64%	0.0%	0.0%
Licensed Fixed Wireless	29.12%	18.69%	0.0%	0.0%
Business Fiber	0.26%	0.26%	0.23%	0.23%

Upon further examination, cable is available to more than four-fifths of residences. Alternatively, high-speed fiber service is only offered to 2.08% of BSLs, with a lower available rate for businesses. The BDC map shows that most cable service is available throughout the county, with fiber in select points as a result of Breezeline's VATI project. In general, there are significant gaps in wireline and licensed fixed wireless service, with about 13% of the count without 100/20 service.

Figure 10: Broadband Data Collection Snapshot of Breezeline Fiber Areas in Mathews

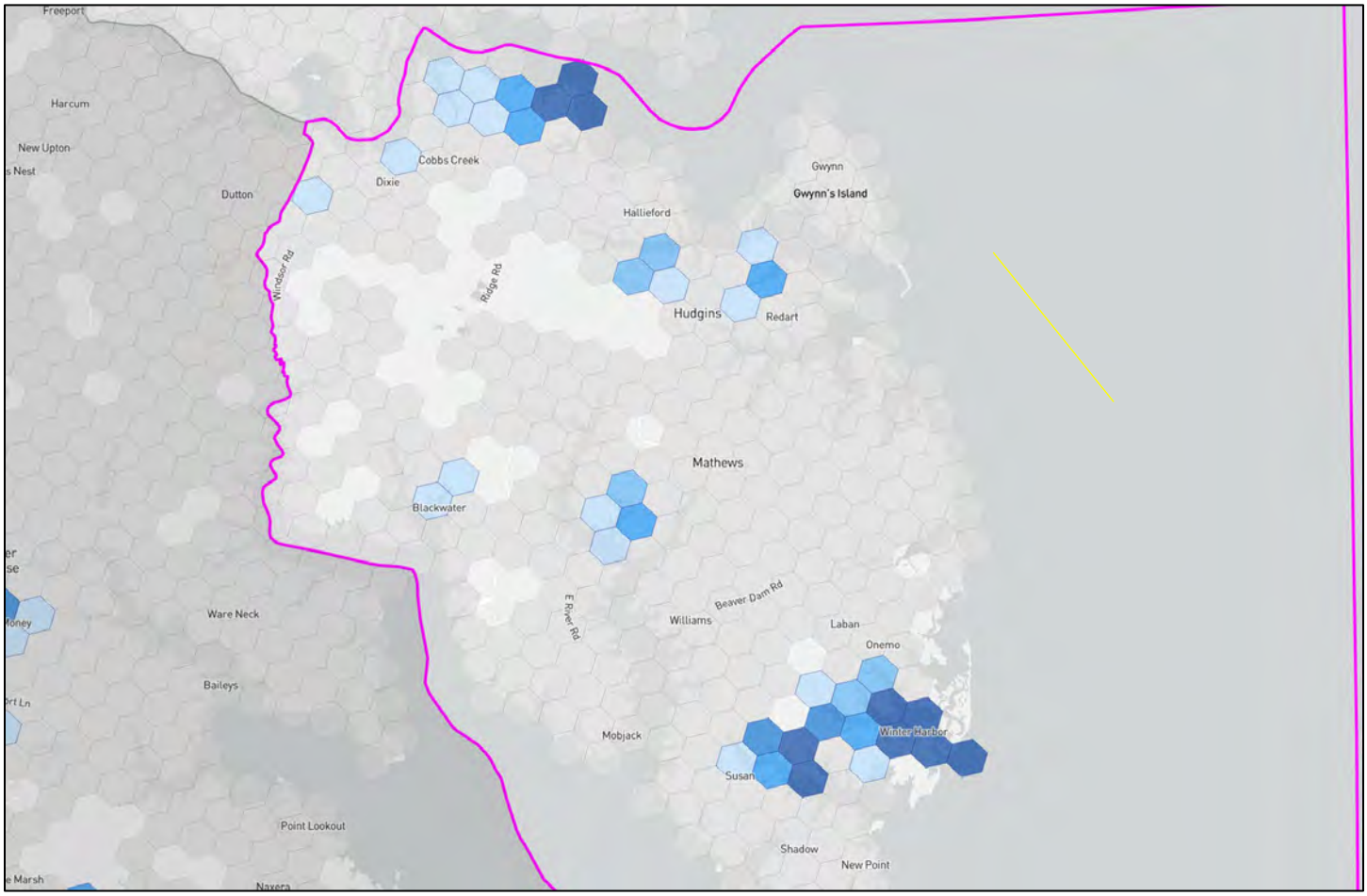


Table 3: Top Residential Carriers in Mathews

Carrier	Technology/ies	Percent BSLs Covered
SpaceX/Starlink	Low-orbit Satellite	100%
HughesNet	Traditional Satellite	100%
Viasat	Traditional Satellite	99.7%
Breezeline	Cable, Fiber	84.52%
Open Broadband, LLC	Fixed Wireless	10.58%
Virginia Broadband, LLC	Fixed Wireless	24.95%
T-Mobile	Fixed Wireless	28.82%
Verizon	Fixed Wireless	14.32%
AT&T	Fixed Wireless	2.14%

Table 3 shows that the highest available technology is in fact satellite, available to almost every resident of Mathews. For wireline services, Breezeline is the only incumbent, providing mostly cable and some HFC/fiber service. There are select areas where Open Broadband and Virginia Broadband provide fixed wireless service. The remaining three providers are also notable mobile/cellular companies that offer fixed wireless service – T-Mobile for instance, markets fixed home internet service as '5G Wireless Home Internet' which uses their cellular technology to deliver broadband.

Table 4: Available Internet Packages and Pricing in Mathews

Carrier	Technology	Tier	Monthly Price
Starlink (SpaceX)*	Low-orbit Satellite	Residential Unlimited	$120
Starlink (SpaceX)*	Low-orbit Satellite	Residential Lite (Deprioritized)	$80
HughesNet	Traditional Satellite	Standard (~25 Mbps)	$60–70
Viasat	Traditional Satellite	Standard (~30 Mbps)	$70–80
Breezeline	Cable	UltraFast (up to 500 Mbps)	$109.99 ($39.99 promo)
Breezeline	Cable	GigaFast (1 Gbps)	$132.99 ($49.99 promo)
Breezeline	Fiber	Fiber UltraFast (500 Mbps)	$109.99 ($39.99 promo)
Breezeline	Fiber	Fiber GigaFast (1 Gbps)	$132.99 ($49.99 promo)
Open Broadband	Fixed Wireless	100/20 Mbps	$64.99
Open Broadband	Fixed Wireless	200/20 Mbps	$84.99
Virginia Broadband	Fixed Wireless	ISP Packages (varies)	$60–80

**Starter hardware kit costs approximately $349–$500*

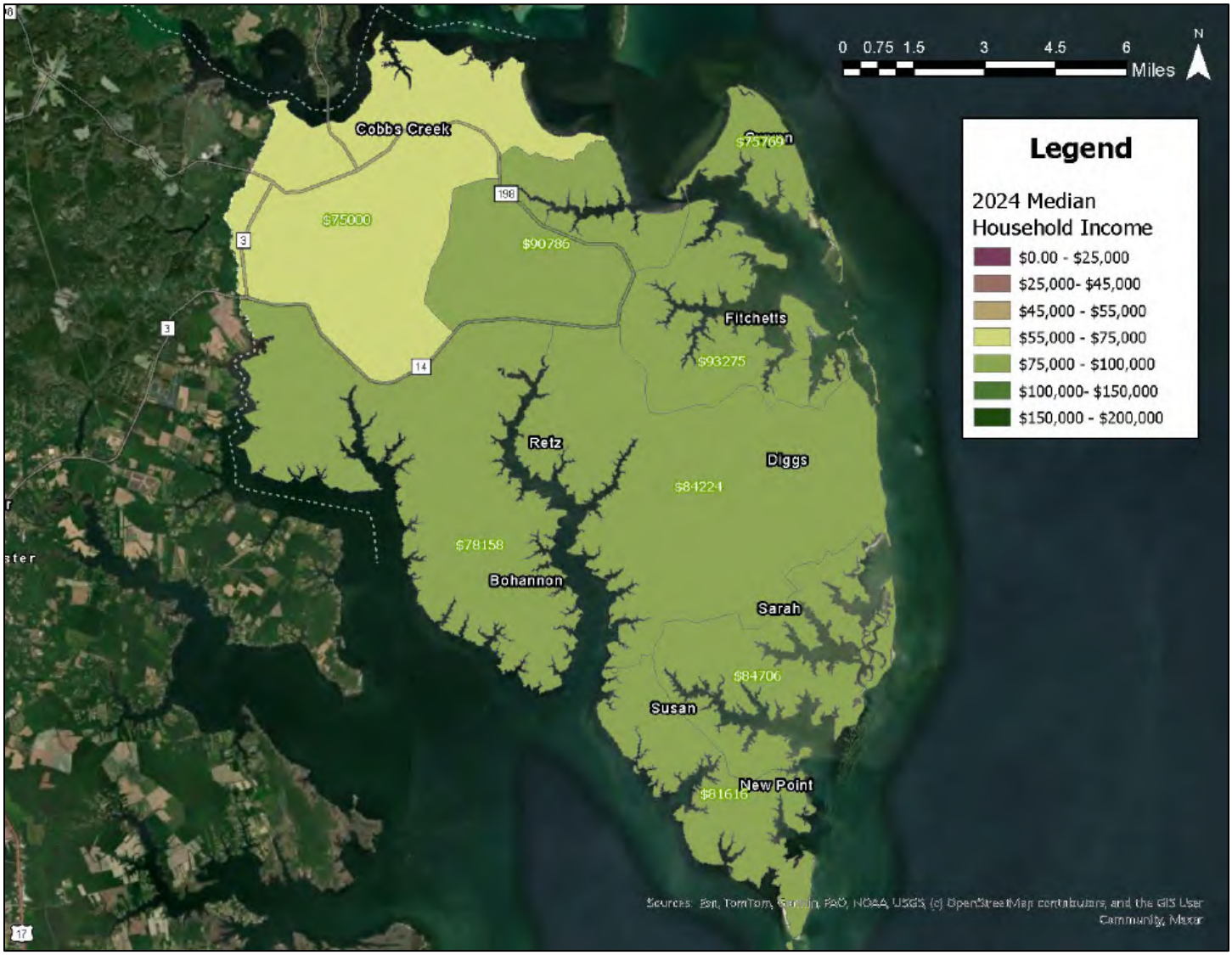
Overall, from an availability of accessible service perspective, Mathews has some major gaps in broadband coverage to the least-served areas as a result of mainly geographic and low-population density factors. For the people that cannot access cable service, 5G fixed wireless and satellite are there to fill in the gaps at a varying speeds. However, there are some obvious disadvantages to the current landscape, being the lack of pure fiber connection, (which can lead to more buffering and throttling during high traffic times, as well as low upload speed), and there only being one predominant wireline provider (Breezeline), which means that there is not enough competition to drive down broadband prices.

4.3 Covered Population Needs Assessment

4.3.1 Individuals in Covered Households (Income no more than 150% of the poverty level)

Considering 150% of 2025's FPL as a threshold, along with Mathews' average household size of 2.24 people, households falling between $31,725.0 and $39,975.0 will fit these criteria (on average). When visualized with the most current ESRI 2024 data, there are no areas throughout the county where average median falls below this metric (depicted by maroon blocks). In fact, the county has a median income on par with the entire state of Virginia, which was estimated at $89,931 in 2023. The only exception is the tract between Dixie and Cobbs Creek, which is relatively low-density compared to the rest of Mathews, and borders Gloucester and Middlesex. When looking at Figure 12 breaking down household counts by income threshold, there appears to only be 615 households that make less than $34,999 annually, consisting of about one-tenth of total homes in the county.

Figure 8: 2024 Median Household Income (ESRI 2024)



***Areas with "$0" median income have no reported data, usually denoting non-residential spaces (in this case, military).**

Table 5: 2025 Federal Poverty Guidelines

2025 POVERTY GUIDELINES FOR THE 48 CONTIGUOUS STATES AND THE DISTRICT OF COLUMBIA		
Persons in family/household	**Poverty guideline**	**150% of Poverty Level**
1	$15,650	$23,475.0
2*	$21,150	$31,725.0
3*	$26,650	$39,975.0
4	$32,150	$48,225.0
5	$37,650	$56,475.0
6	$43,150	$64,725.0
7	$48,650	$72,975.0
8	$54,150	$81,225.0

For families/households with more than 8 persons add $5,500 ($8,250) for each additional person.

**The average household size in Mathews County is 2.6 people*

Figure 9: Households Counts in Income Thresholds for Mathews (ESRI 2024 Estimates)

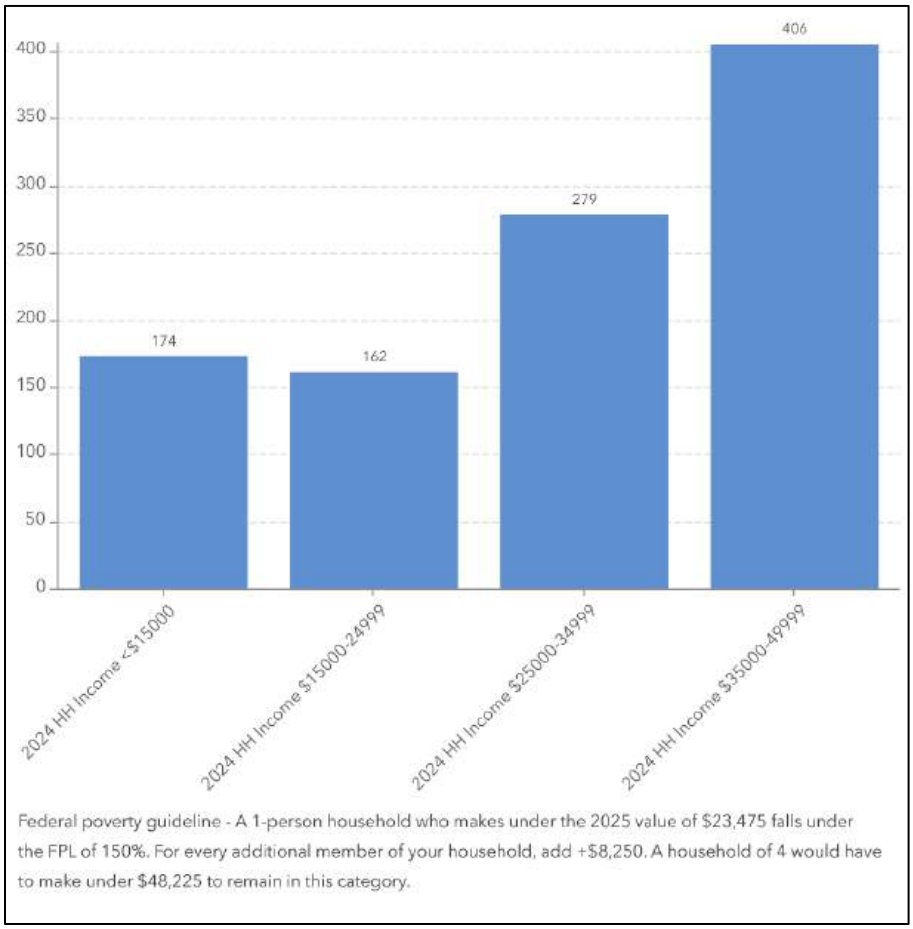


Figure 10: Income Inequality (ESRI 2024)

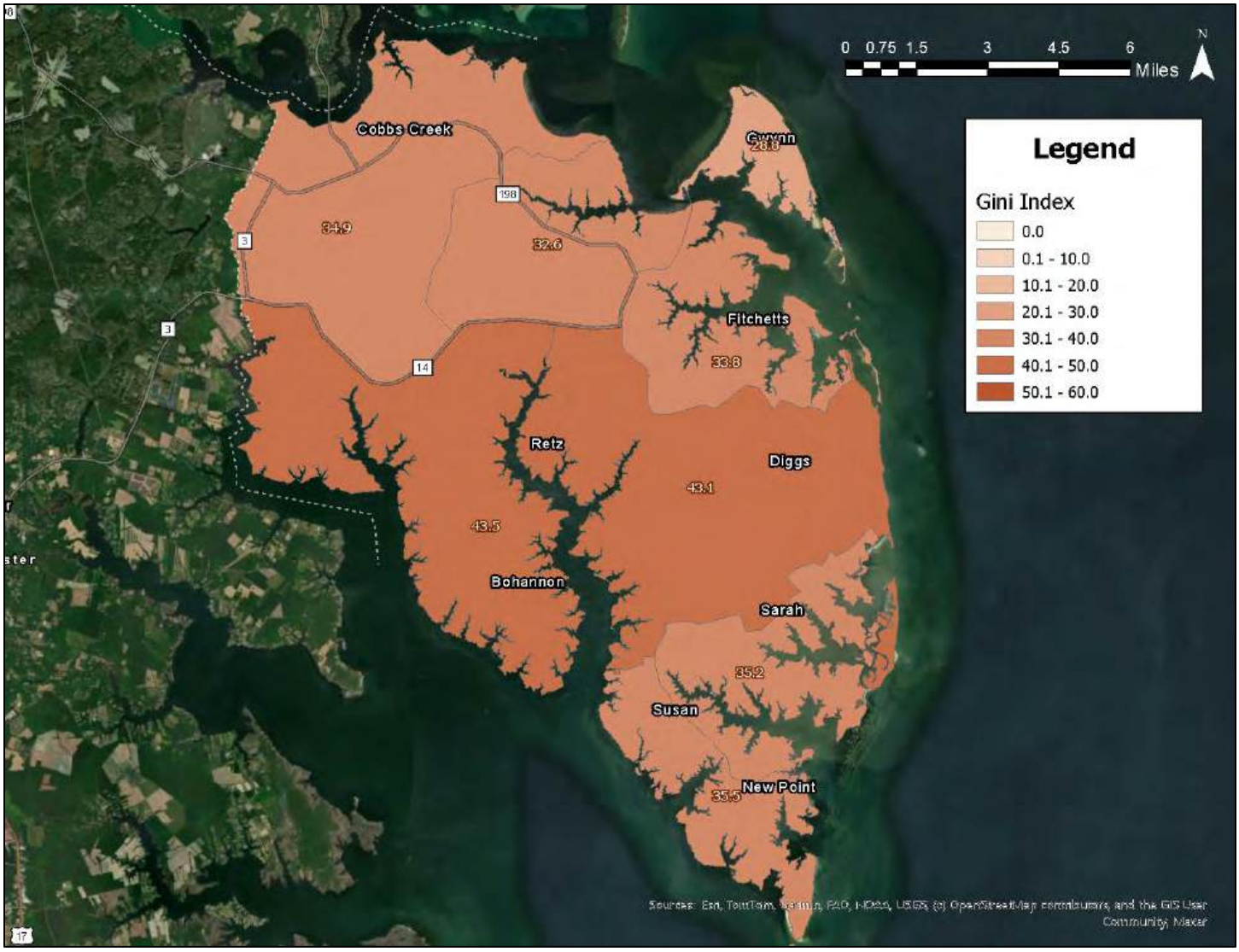
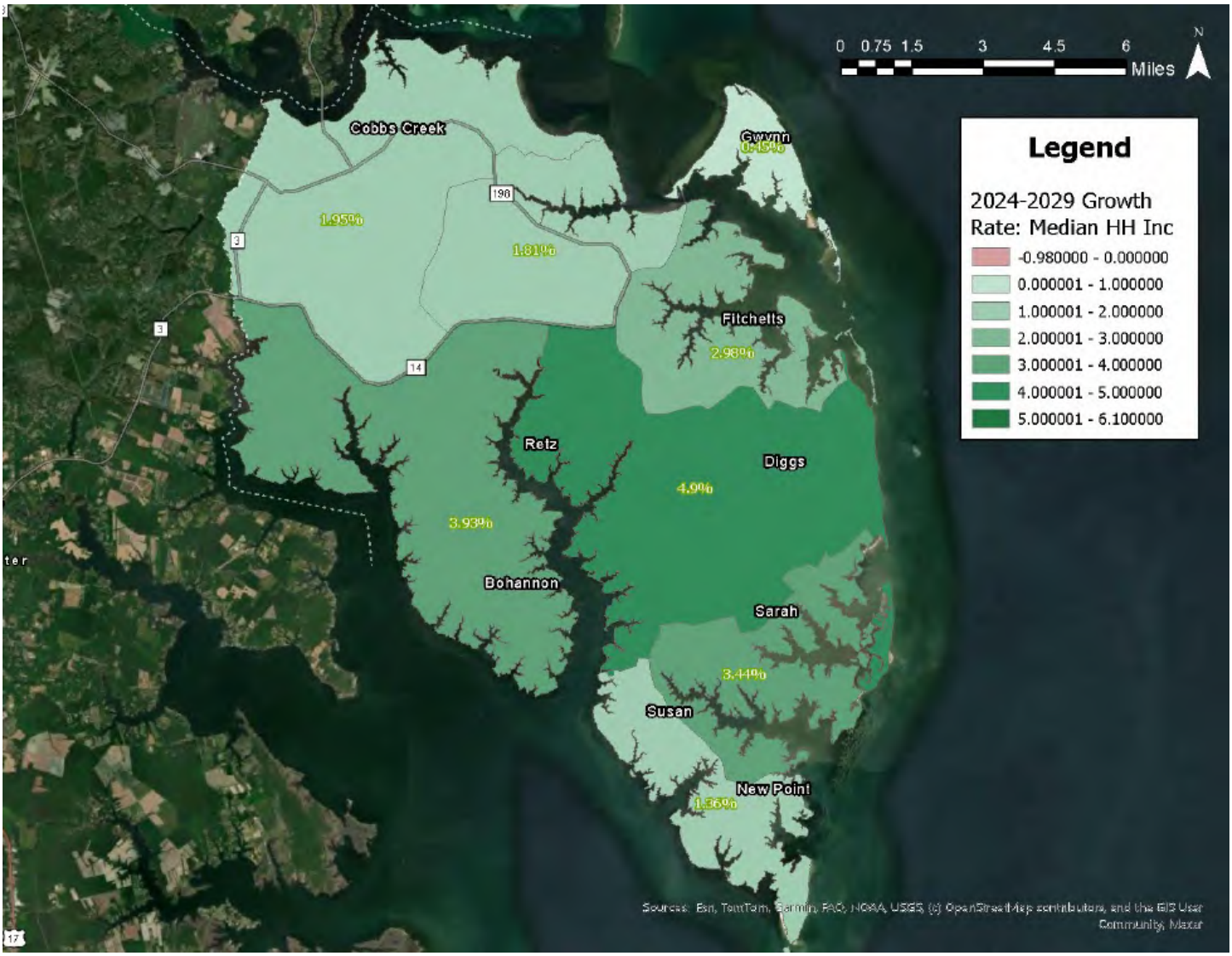


Figure 13 depicts income inequality using the *Gini Index,* where 0 is perfect equality and 100 is perfect inequality. To get a better idea of where these low income homes may be, comparing this map to the previous median income map will give an idea of the variance of highest and lowest incomes in a Census Tract. The county is about consistently wealth-inequal, except for Gwynn's Island, which is the only tract with a score under 30.

Figure 11: 2024-2029 Growth Rate: Median Household Income



The last layer that depicts wealth inequality is focused on ESRI's 5-year income projections, which shows relative growth for most of the county. There are no areas where there is anticipated decline in income, and areas of highest growth overlap with moderate-high income tracts in Figure 11, showing a 'flattening-effect' where average income in the county as a whole will be less severe tract-by-tract and will result in lower Gini scores. When overlaid with V3.2 BEAD data, there does not seem to be systemic gaps based on these income metrics, which indicates that gaps in service are more likely to be geography related.

4.3.2 Aging Individuals Over 60

Figure 12: Population Over 60 (ESRI 2024)

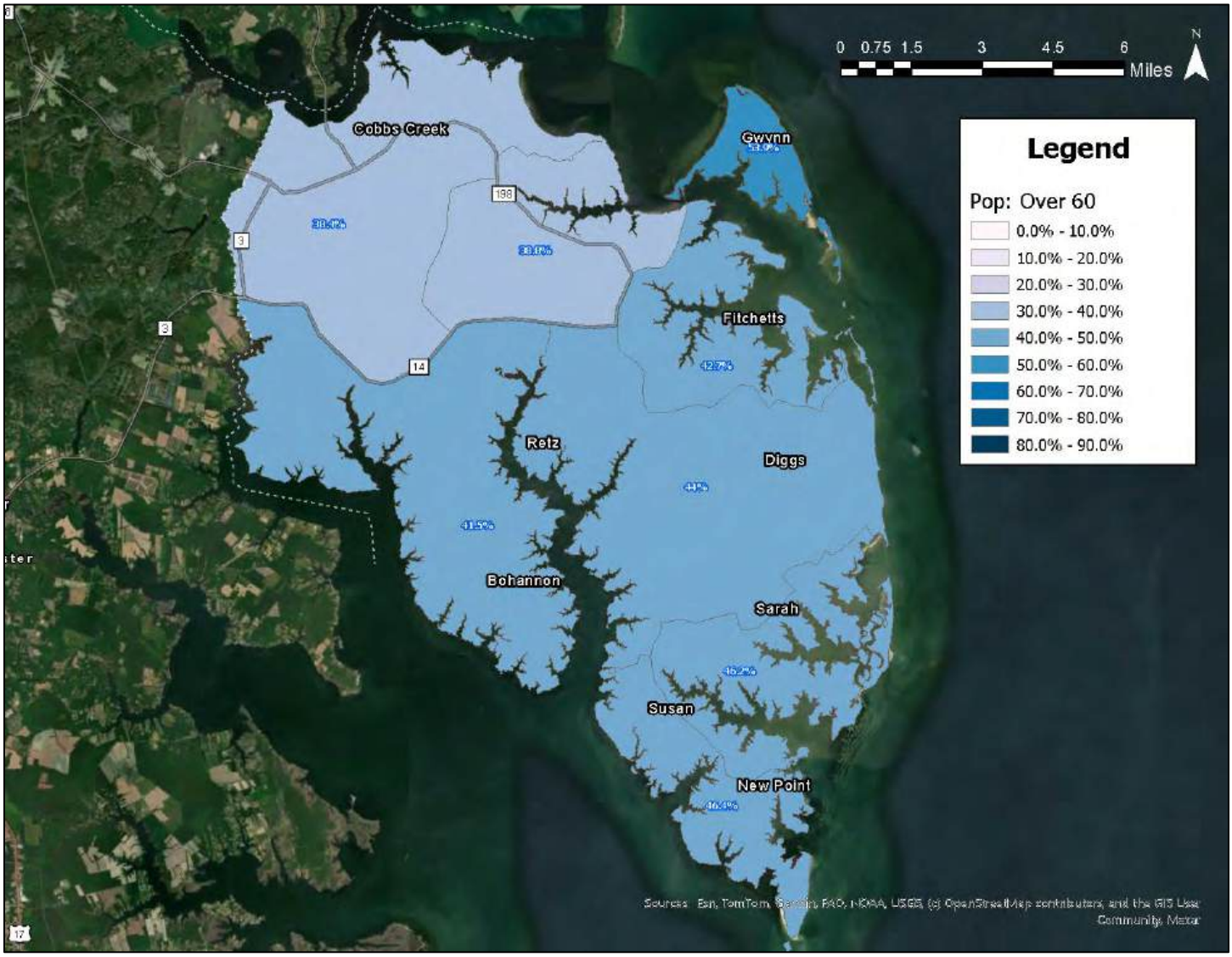
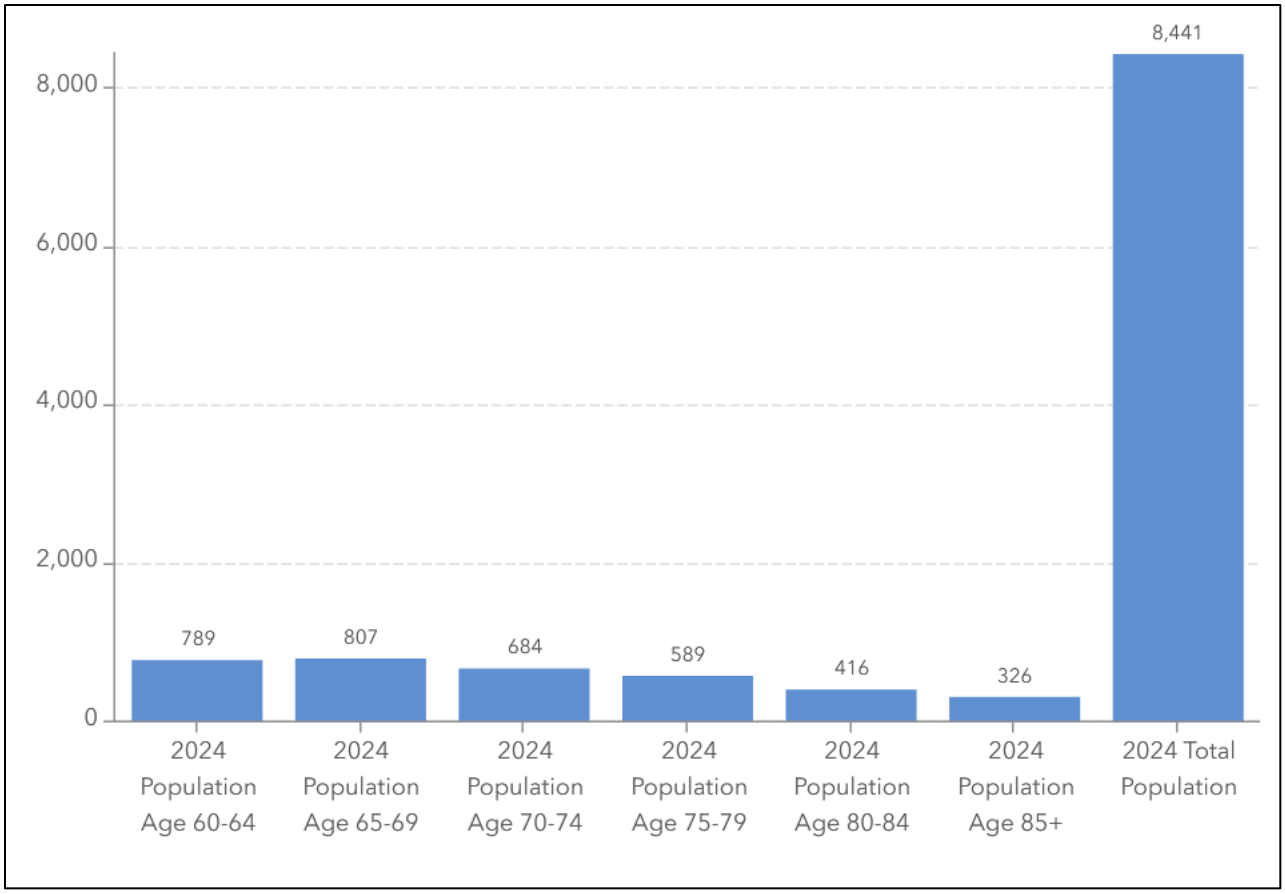


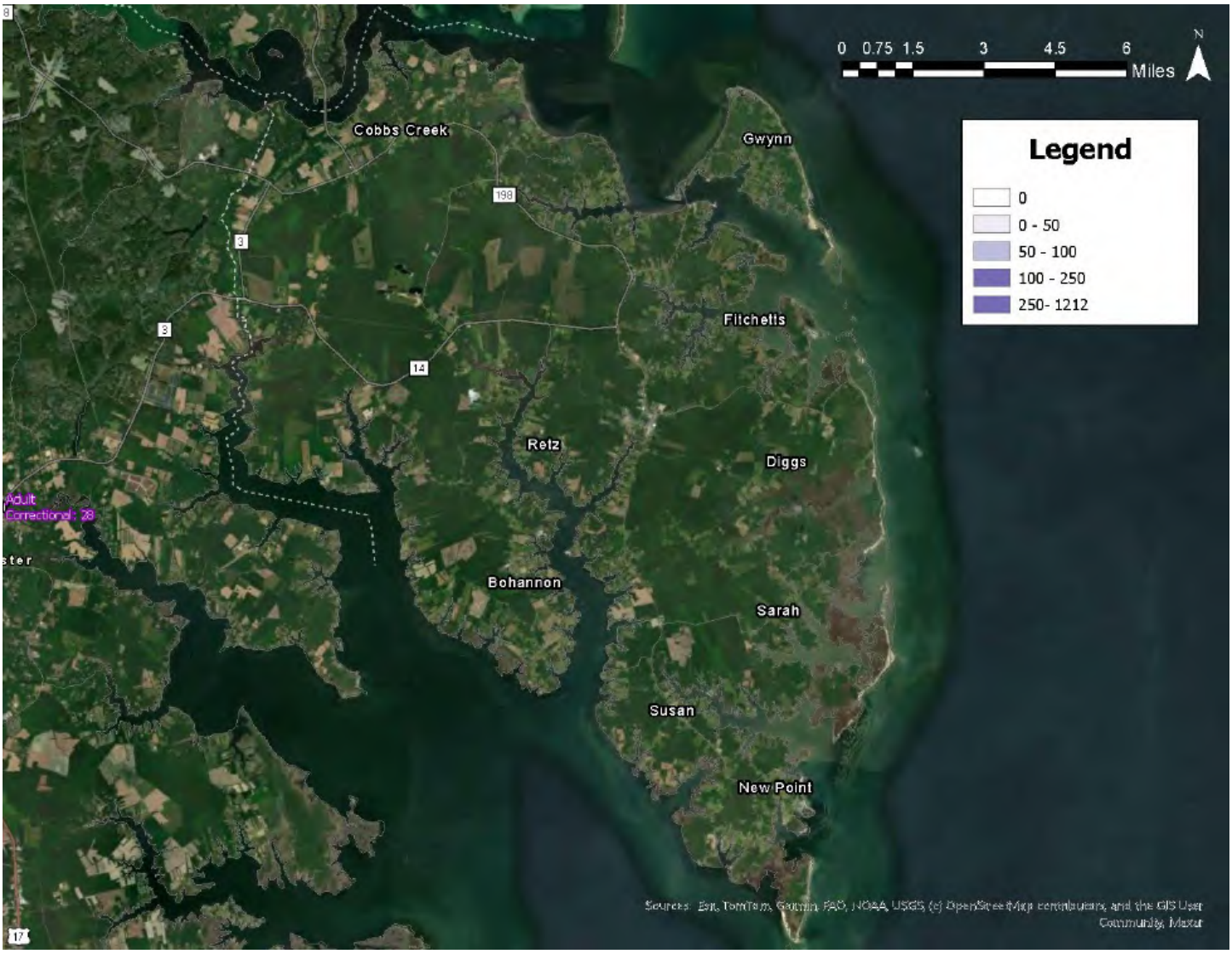
Figure 15 depicts the percentage of each Census Tract that is over the age of 60. In general, the county has a consistently higher overall percentage of population over 60 than its Middle Peninsula neighbors. Most tracts fall near 40% of total population over 60 except for the two tracts from Dutton to Hudgins in the northwest. The next graph (Figure 16) depicts a relatively flat aging population for every 5-year increment until 70, indicating that there are many adults aging-in-place, as well as a potential in-migration of older individuals.

Figure 13: Figure 12: Population Over 60 in 5-Year Increments for Mathews (ESRI 2024 Estimates)



4.3.3 Incarcerated Individuals

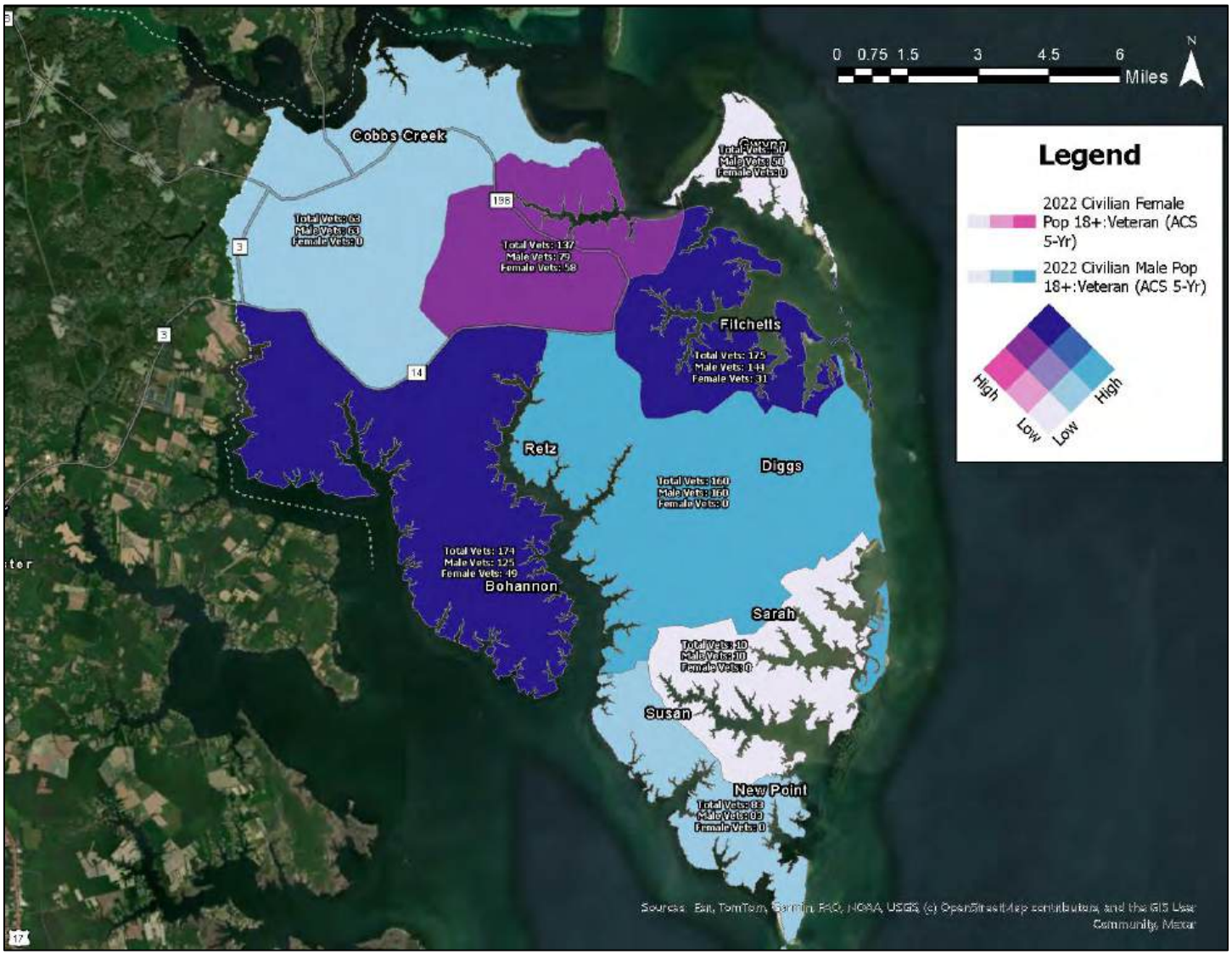
Figure 14: Adult and Juvenile Correctional Population (Census 2020)



Mathews county houses prisoners in detention in its Sheriff's office, but inmates are sent to the Middle Peninsula Regional Security Center. This facility houses individuals from Essex, King and Queen, King William, and Mathews counties additionally, and at the time of this writing, has 197 inmates. According to the facilities website, it offers Adult Basic Education (ABE), General Educational Development (GED) test preparation, and functional literacy courses in reading, writing, and math. Inmates also have access to job readiness training, work ethics development, and vocational learning, often through participation in internal or external work crews performing facility maintenance, landscaping, janitorial services, and other skilled tasks. Although the facility does not publicly advertise advanced digital learning systems, it does support electronic messaging and communication services via tablet-based platforms. These devices allow inmates to access approved educational materials, correspondence coursework, and digital wellness content. While there is no confirmation of full internet-based vocational or college-level programs, the digital infrastructure in place lays the foundation for expanded reentry programming, including financial literacy, basic computer skills, telehealth access, and virtual counseling.

4.3.4 Veterans

Figure 15: Veteran Distribution by Biological Sex (ACS 2022)



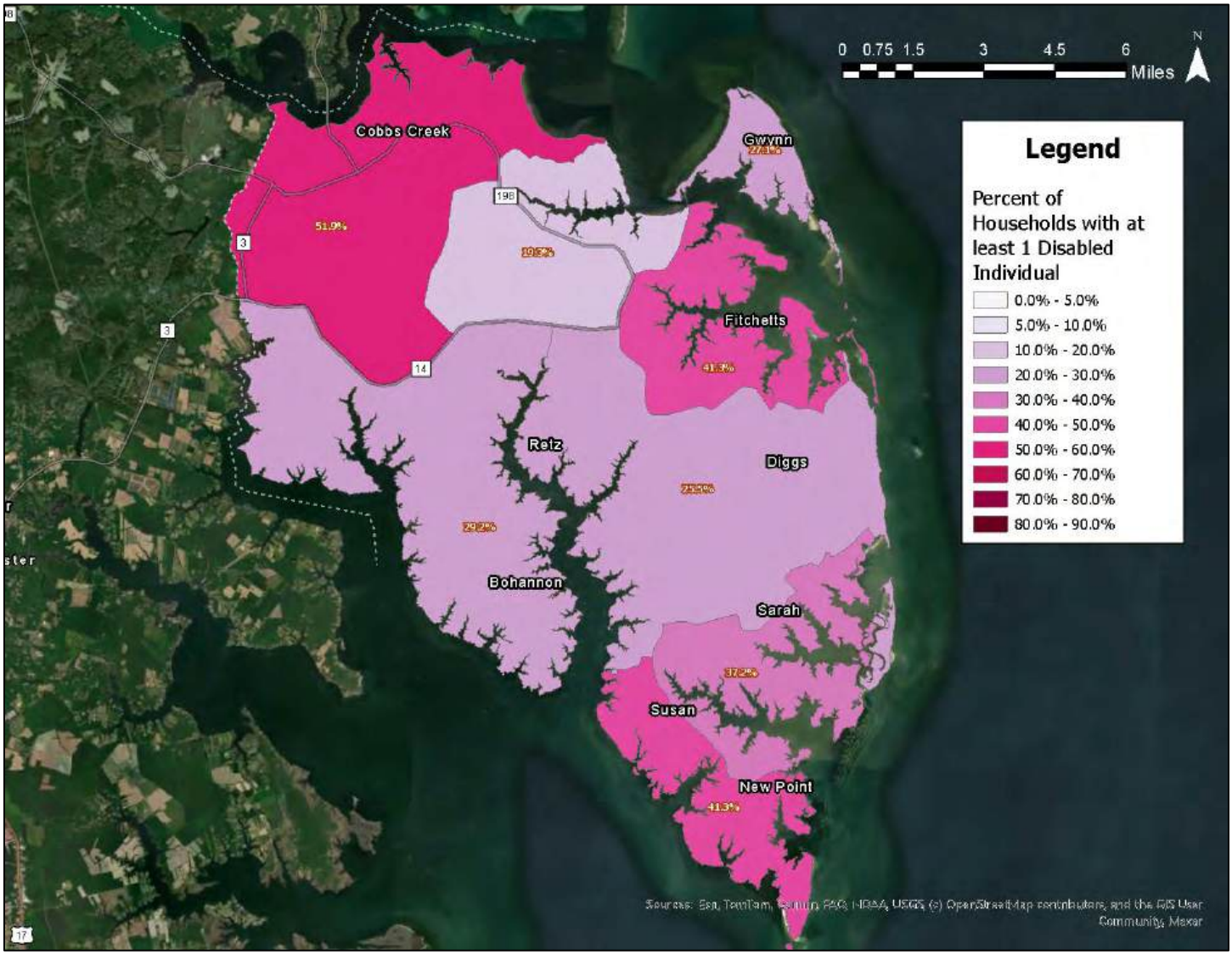
The map above shows veterans aged 18 and older across Mathews, using 2022 American Community Survey (ACS) 5-year estimates. It visualizes both male and female veteran populations at the census tract level. Dark blue represents a large sum of both, while white shows that there are few in a tract. A darker shade of blue shows a higher number of male vets, while pink shows the opposite.

From the data, it is clear that Mathews has a high population of Veterans. This aligns with Hampton Road's longstanding historical ties to military service, particularly through its proximity to major naval installations in Norfolk, Portsmouth, Newport News and the greater Hampton Roads region, and Mathews' draw as a place to retire.

What stands out in this dataset is the lack of Veterans located in Sarah and Peary, which means that any Veteran focused programming should be centrally located to Mathews, or if shared, closer to the inland county boarder.

4.3.5 Individuals with Disabilities

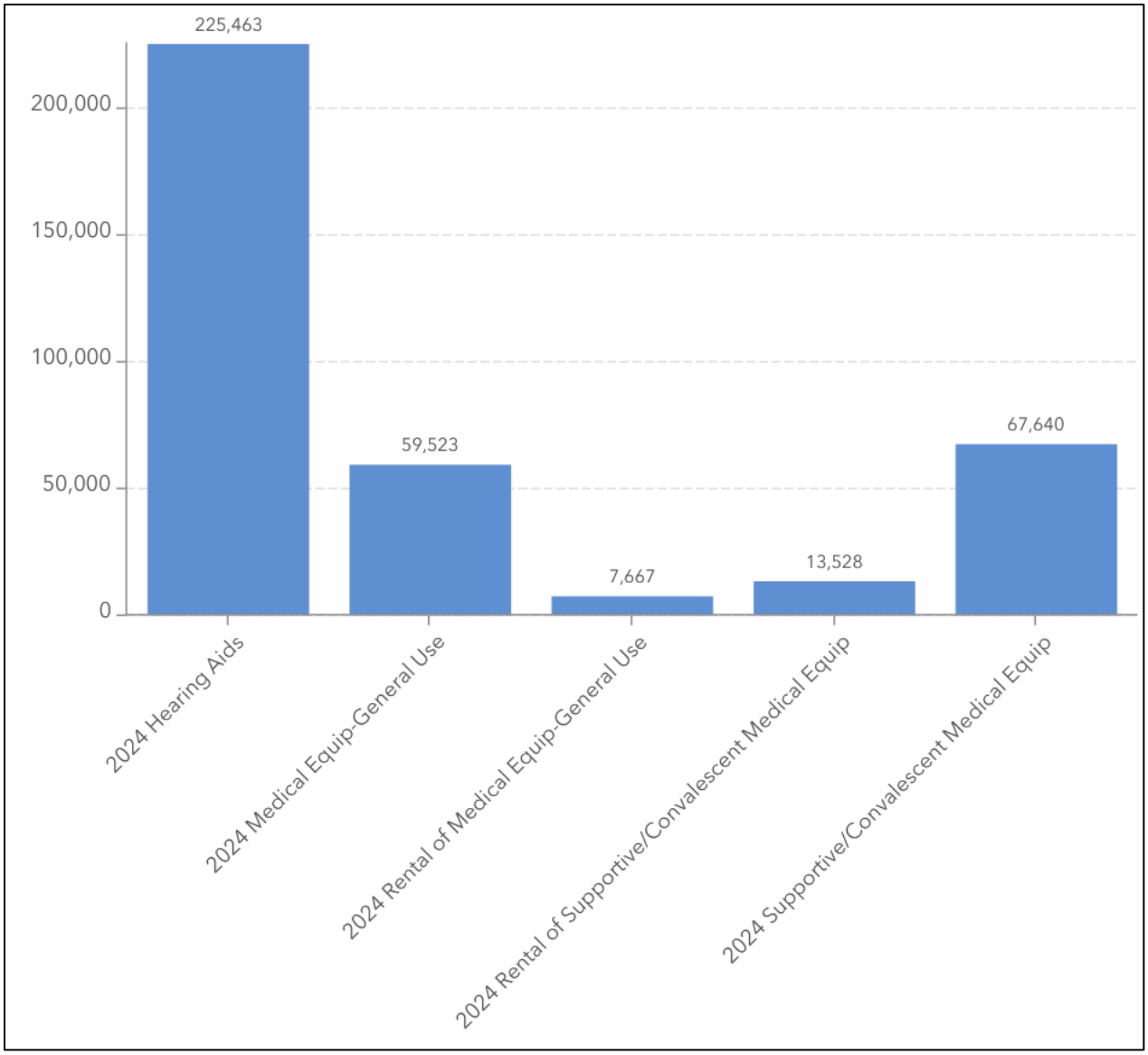
Figure 16: Households with at least 1 Disabled Person (ACS 2022)



The map shows that disability is a broad issue in Mathews, with certain tracts bearing a significantly greater burden of more than half of households having at least one disabled individual. While a few areas, particularly Blakes-Hallieford, show lower disability rates (under 20%), the central Mathews reports disability rates exceeding 25%, with several tracts exceeding in the north and south portions exceeding 40%. Many of these include a high proportion of aging adults, individuals with chronic illnesses, and residents living in public or assisted housing environments, where long-term impairments may be more common.

Coincidentally, the tract that is over 50% also is the tract that had the lowest median household income in the county. This suggests an intersection of barriers, but not necessarily directly related to age or veteran status.

Figure 17: Population in Need of Homecare Device, by Category



Disability includes a wide range of physical, sensory, and cognitive conditions that affect how residents engage with digital technology. The bar chart presents estimated ESRI 2024 expenditure data across various categories of medical and assistive devices, offering insights into which types of equipment are most commonly used among populations that rely on supportive or adaptive technologies. Each category reflects distinct functions and user needs, with the data shedding light on both the scale of use and potential areas for integration into broader digital equity initiatives, particularly for individuals with disabilities or older adults.

The most prominent category is "2024 Hearing Aids," with a projected expenditure of $225,463. This significantly exceeds spending in any other category and highlights the widespread reliance on hearing aids among aging individuals and those with hearing impairments, including veterans. These devices are crucial for facilitating communication, maintaining social interaction, and supporting independence. In a digital context, hearing aids are increasingly paired with smartphones and other internet-connected devices, offering features such as Bluetooth streaming and app-based control.

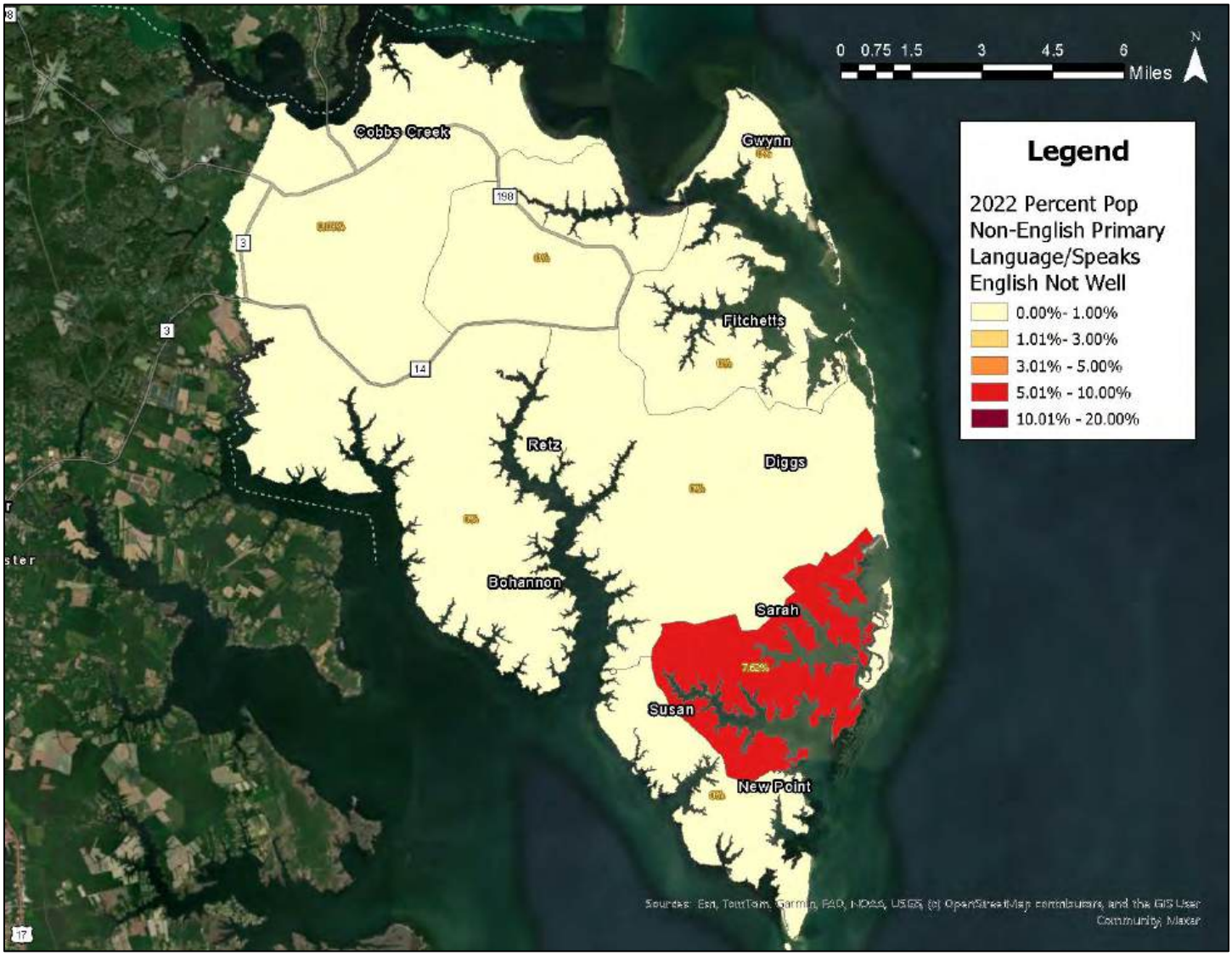
Following hearing aids, "2024 Supportive/Convalescent Medical Equipment" shows the next highest expenditure at $67,640, indicating a strong demand for devices that aid individuals recovering from illness, surgery, or managing chronic conditions. This category typically includes hospital beds, patient lifts, walkers, shower chairs, and specialized mattresses. These devices are essential for ensuring mobility, safety, and home-based care, particularly in households where aging in place or post-operative recovery is occurring.

The "2024 Medical Equipment – General Use" category follows closely, with spending of $59,523. This broad classification likely includes blood pressure monitors, thermometers, glucometers, and respiratory devices like nebulizers or CPAP machines. These are commonly used across a wide range of age groups and medical needs, particularly for chronic disease management.

The rental categories "2024 Rental of Supportive/Convalescent Medical Equipment" at $13,528, and "2024 Rental of Medical Equipment – General Use" at $7,667 suggest some level of short-term or cost-sensitive usage, particularly for temporary recovery scenarios. Renting may appeal to low-income households or those facing short-term mobility needs and could indicate a need for financial assistance programs or device loan programs through community health providers or digital equity partners.

4.3.6 Individuals with a Language Barrier

Figure 18: Speaks English Not Well (ACS 2022)



From ACS 2022 data, it can be found that there is one distinct area in Mathews that contain a relatively high number of individuals who have a language barrier – in the case of Figure 21, they predominantly speak another language but can speak some English "not well". These individuals have 7.62% representation in the Peary – Sarah tract. Figure 22 shows a breakdown of the most common non-English Language by age, demonstrating that by far, Spanish is the most common second language in Mathews, and most Spanish speakers are between the age of 18-64. Indo European speakers are present, but not to a significant degree, mainly speaking German, Arabic, or French. The data seems to indicate multi generations of both these groups as well. Asian-Pacific Island Languages (API) are not represented in the county, and Figure 23 demonstrates that there are no people that speak "no English".

Figure 19: Spoken Language by Age Bracket

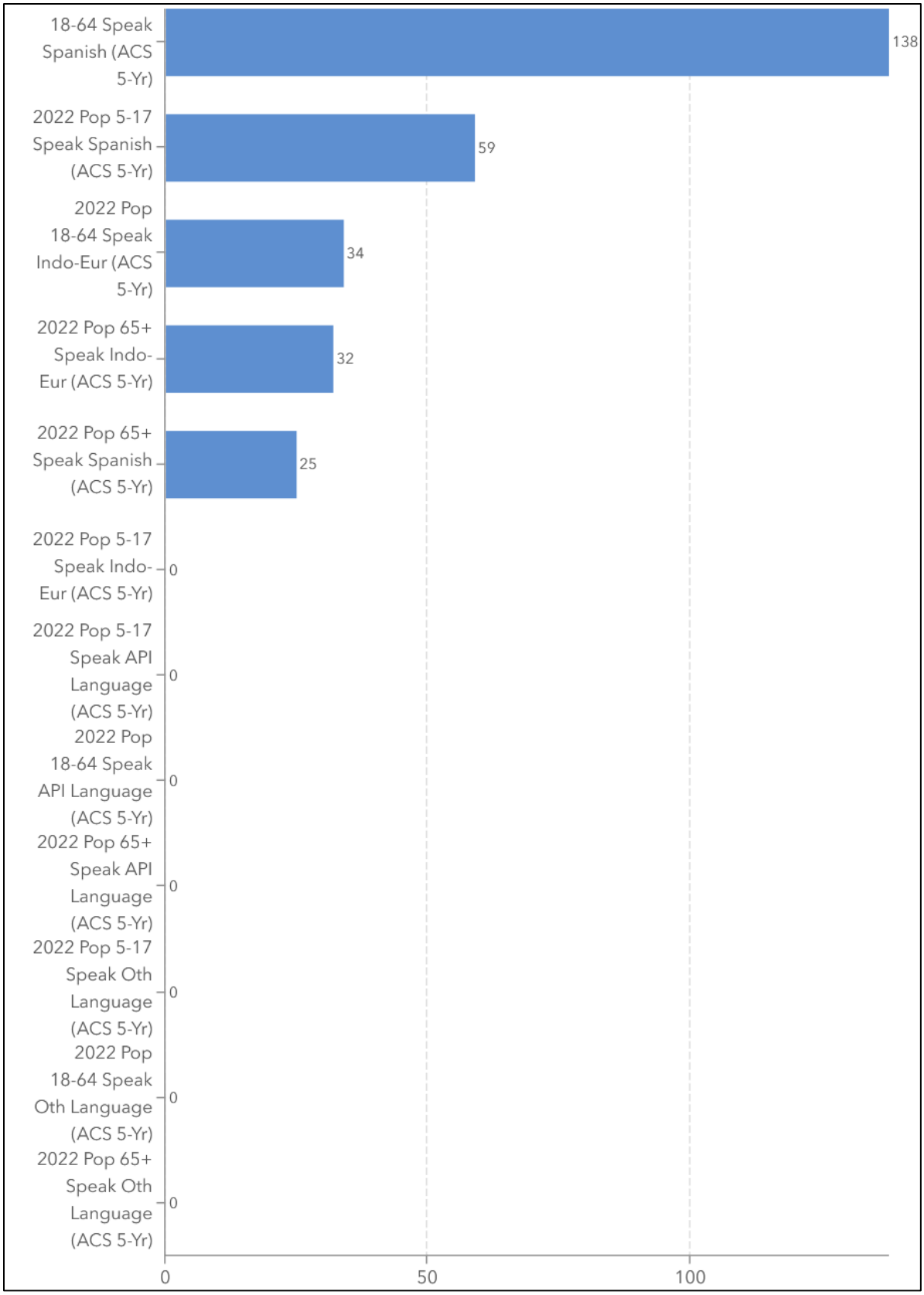
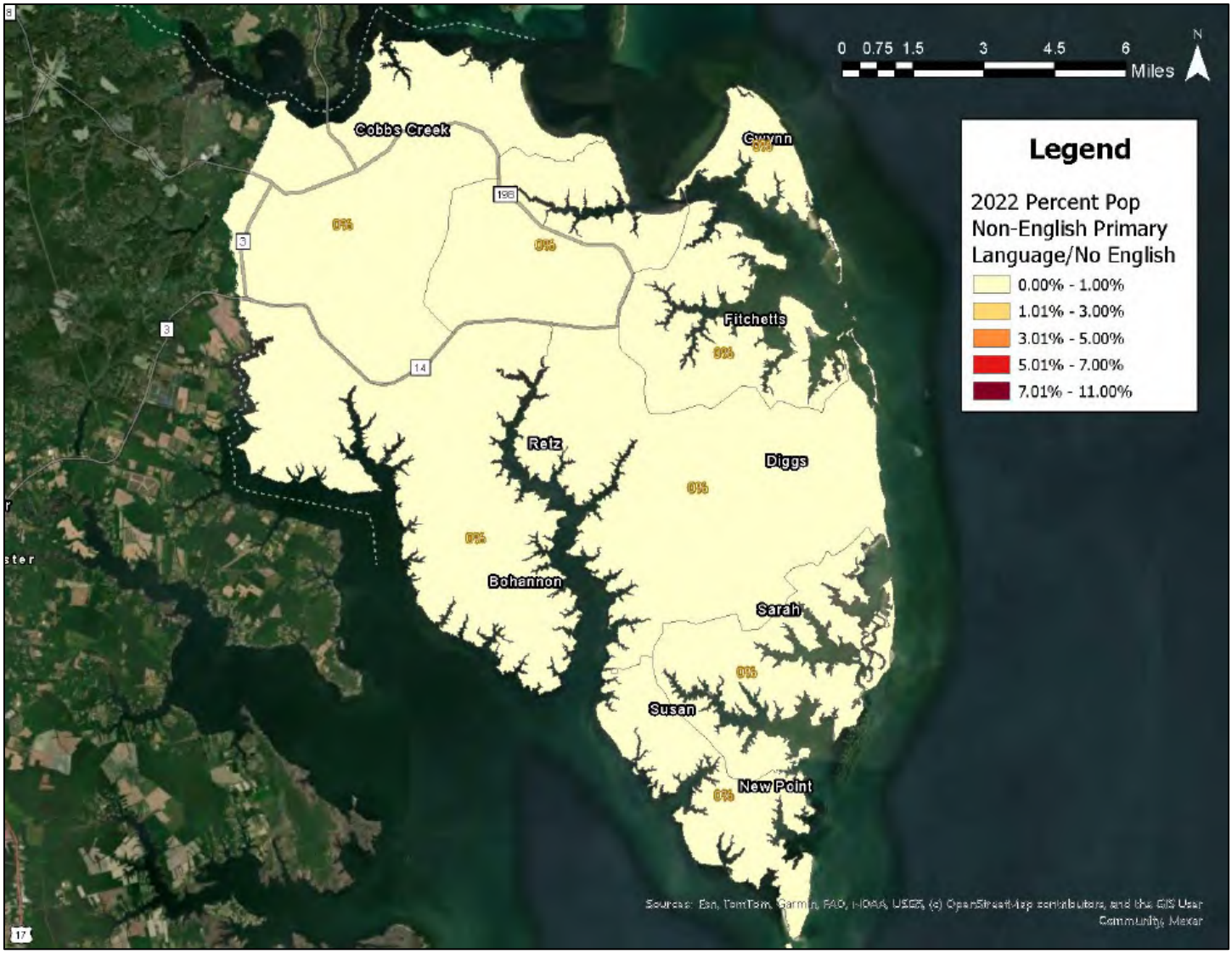
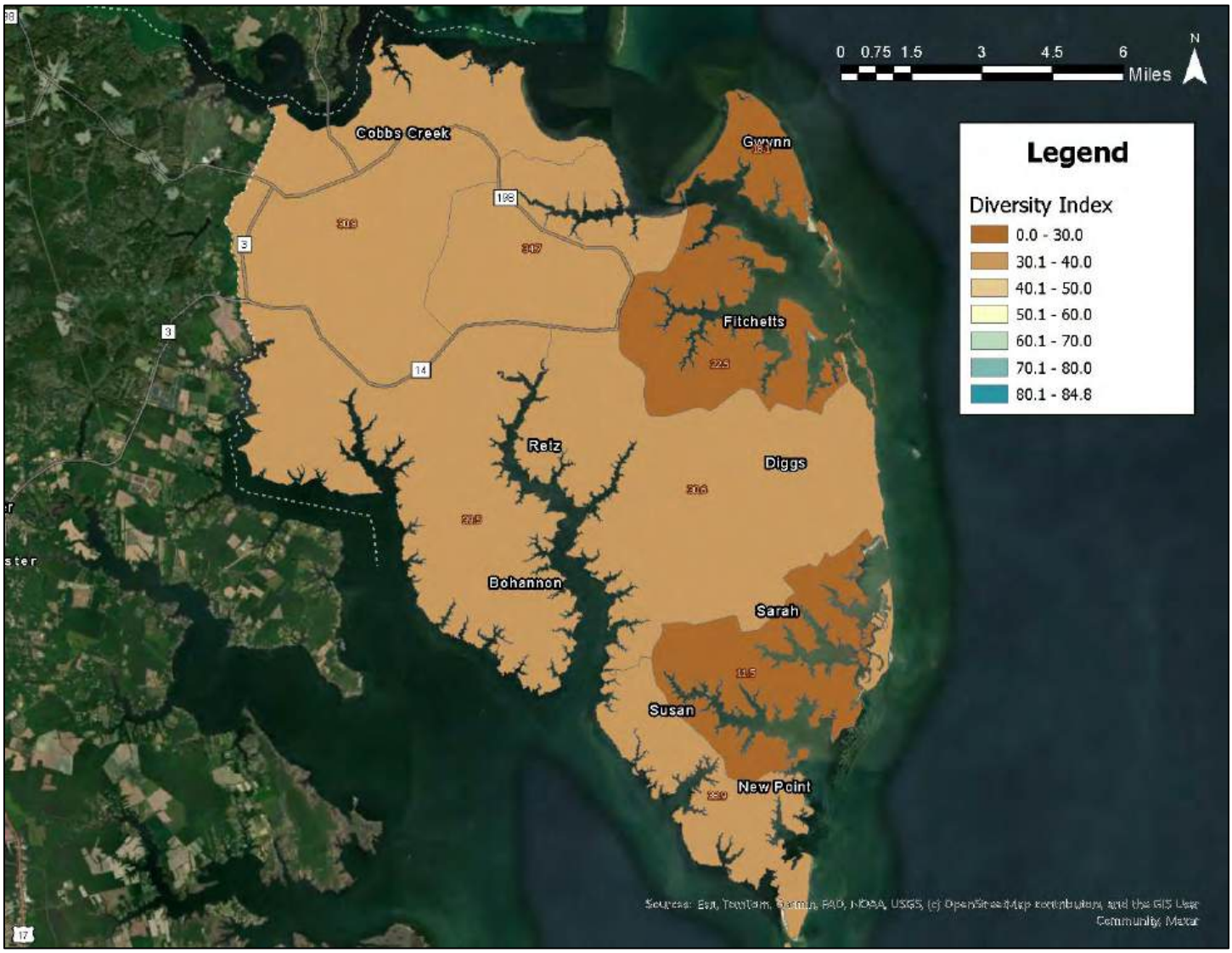


Figure 20: Speaks No English (ACS 2022)



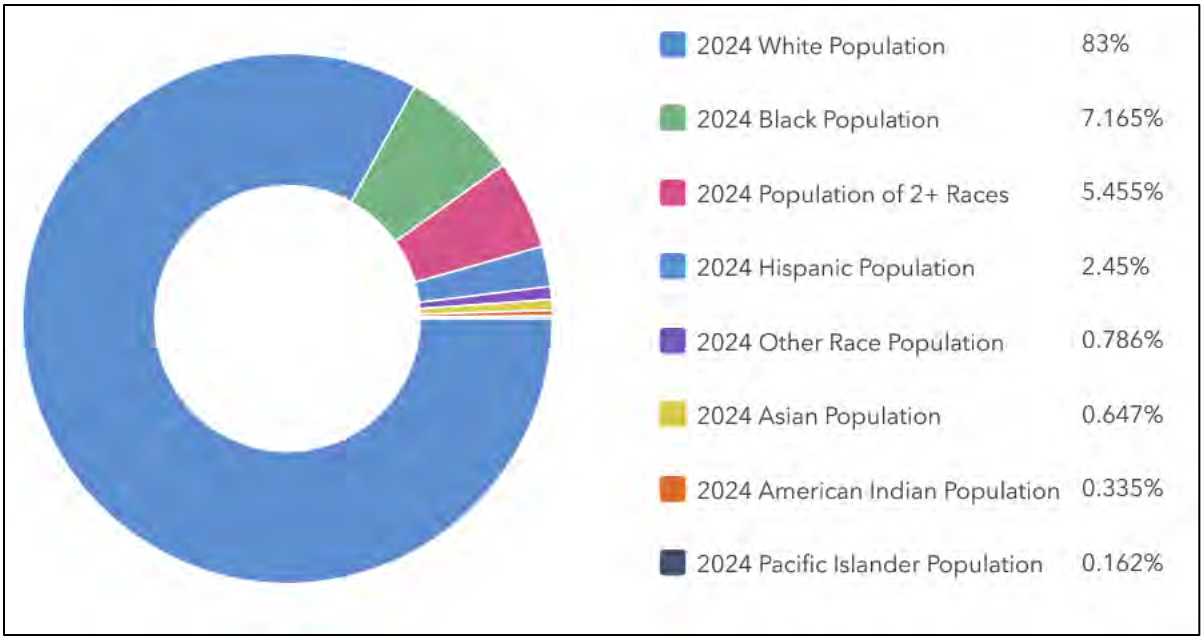
4.3.7 Individuals who are Members of a Racial or Ethnic Minority

Figure 21: Racial Diversity Index (ESRI 2024)



This map shows the racial diversity index in Mathews, according to ESRI 2024 data. The significance of this depiction in the demonstration of racial homogeny compared to areas where there is a greater mix. Darker brown colors indicate lower diversity, while deeper blue denotes a more varied populace. The darkest areas on the map register diversity scores around 20 (except the English "not-well" tract, which is coincidentally more homogenous than the rest of the county), indicating low-diversity in these communities. To add, no area exceeds a score of 40, which combined with Figure 25 (showing) population breakdown by percentage), can be seen that the 17% of non-white individuals are mostly spread out in specific areas of the county (and conversely, concentrated in the Susan – Sarah tract).

Figure 22: Racial Breakdown by Percentage (ESRI 2024)



4.3.8 Results

Across Mathews County's covered populations, several common threads emerge that signal opportunities for unified digital opportunity strategies. Despite differences in age, background, or status, the data depicts that the most common issues facing the county in terms of digital access are geographic isolation, chronic health conditions, and reduced access to institutional support systems. These shared characteristics present compounded barriers to digital engagement, especially in areas lacking robust broadband infrastructure or community-based access points.

Aging residents, individuals with disabilities, and veterans often face similar challenges when it comes to navigating digital systems independently. Many live on fixed incomes, rely on assistive or medical devices, and require accessible interfaces to interact with telehealth, benefits platforms, or digital communication tools. These populations frequently reside in the same parts of the county - rural peninsulas, inland tracts with aging housing stock, or transitional neighborhoods - where broadband availability is weakest. As a result, even those with the motivation to get online may be physically or financially cut off from the necessary infrastructure, devices, or skills training.

Even where populations are statistically small, such as individuals with limited English proficiency or racial and ethnic minorities, the risk of marginalization is amplified when digital tools are not adapted to their needs. For example, Spanish and Indo-European language speakers, while dispersed and limited in number, may still face subtle language and cultural access barriers when navigating health care systems, job applications, or school portals. Ensuring language accessibility and culturally responsive training across all covered populations helps reduce exclusion, especially in cases where multiple vulnerabilities overlap.

4.3.9 Additional Information - Sources

These maps should serve to help community partners and local leaders make informed decisions about where and what services to implement. The data sets presented here have their own advantages and use cases and should be refreshed when this process is conducted periodically. The webtool also lets you overlay layers and statistics for complex analysis.

Census 2020 data - provides a *complete count* of the U.S. population every ten years, offering the most authoritative and geographically precise snapshot of population and housing data. Its key strength lies in its accuracy and full coverage at the block level, making it foundational for redistricting, federal funding allocation, and baseline trend analyses. However, a major weakness is its infrequency; it quickly becomes outdated, especially in rapidly changing areas. Additionally, the 2020 Census was impacted by pandemic-related disruptions and administrative changes that led to known undercounts, especially of racial minorities, renters, and young children, and overcounts in other populations.

American Community Survey (ACS) 5-Year Estimates - balances sample size and timeliness by collecting data continuously and aggregating over five years. This data set provides rich socioeconomic variables (e.g., income, education, disability, language, and internet use) with statistical reliability at small geographic scales like census tracts. Its main strength is the breadth of data topics it covers annually. However, because it is based on a sample rather than a full count, its estimates, especially at smaller geographies, can have significant margins of error and may not capture rapid changes year to year.

ESRI 2024 - modeled projections based on a blend of public datasets (like Census and ACS), information from data brokers (such as Data Axle®) and proprietary forecasting methods. This data is especially useful for planning because they provide updated population and demographic estimates between decennial censuses, incorporating trends like housing development, migration, and economic shifts. ESRI also collects a wide swath of other data, such as consumer behavior and personal habits (psychographics). Its strength lies in providing the most *current* view of community demographics. However, as modeled data, they lack the transparency and direct sampling methods of federal sources and may introduce bias or inaccuracies in areas with limited recent data. These figures are updated and republished annually.

This data was obtained from ESRI's ArcGIS Pro online Data Enrichment processing tool, which aggregates these sources for analysis on the census tract (sometimes block) geometry. To obtain the list of more than 400 variables used in this report for your own export from the platform, please contact Broadband Telecom.

4.4 Asset Inventory

Note: This section lists community partner profiles for any organization that had some type of correspondence with the project team who compiled this plan. There were varying degrees of participation by each community partner listed, from either brief correspondence or more involved data and project sharing, meeting attendance and general collaboration.

4.4.1 Community Partner Profiles

- Mathews Resource Council

Contact:

P.O. Box 94

Mathews, VA 23109

mathewsresourcecouncil@gmail.com

History & Mission

The Mathews Resource Council is a coalition of local nonprofits, government agencies, and community leaders working together to meet the essential needs of residents through service coordination, shared resources, and collaborative problem solving.

Current Services for Covered Populations

The Council supports low-income individuals, seniors, and families in crisis by improving access to health, housing, and technology through community partnerships.

- Monthly coordination meetings with local service providers
- Resource mapping and referral network development
- Support for digital equity initiatives through community outreach
- Coordination with schools and Social Services for wraparound support

■ Gloucester-Mathews Care Clinic

Contact:

6031 Industrial Dr.

Gloucester, VA 23061

(804) 642-9515

www.gmcareclinic.com

History & Mission

Founded in 1998, the Gloucester-Mathews Care Clinic provides high-quality, community-based healthcare to uninsured and underinsured adults in the region, including residents of Mathews County.

Current Services for Covered Populations

The clinic serves low-income adults with chronic health needs who lack access to consistent primary care and telehealth

resources.

- Free or low-cost primary and specialty care
- Behavioral health services and medication assistance
- Chronic disease management and health education
- Telehealth visits and digital appointment coordination
- Pharmacy and laboratory support for eligible patients

■ Mathews Memorial Library

Contact:

251 Main Street

Mathews, VA 23109

(804) 725-5747

www.mathewslibrary.org

History & Mission

Mathews Memorial Library serves as a cultural and educational hub for the county, promoting lifelong learning, digital literacy, and community engagement through free public services and resources. *It's a gem of a library and deserves much more love and attention from the community. Go check it out if you haven't!*

Current Services for Covered Populations

The library supports rural residents, aging adults, and individuals with limited tech access or skills.

- Free public Wi-Fi and computer access
- Digital literacy classes and one-on-one tech help
- Access to e-books, streaming media, and learning platforms
- Printing, copying, and fax services
- Genealogy and local history archives
- Programs for children, seniors, and underserved learners

- Mathews Community Foundation

Contact:

P.O. Box 1037

Mathews, VA 23109

(804) 725-3454

www.mathewscf.org

History & Mission

The Mathews Community Foundation is a local affiliate of the Community Foundation for a greater Richmond. It focuses on building local philanthropic resources and funding critical services for Mathews residents.

Current Services for Covered Populations

MCF supports nonprofits serving rural, aging, low-income, and otherwise disadvantaged residents by distributing grants and fostering collaboration.

- Annual grant cycles for health, housing, education, and tech access
- Capacity-building support for local nonprofits
- Strategic partnerships in digital equity and telehealth
- Support for youth programming and senior services

- Habitat for Humanity – Gloucester-Mathews Chapter

Contact:

P.O. Box 35

Gloucester, VA 23061

(804) 695-9655

www.habitatgmc.org

History & Mission

The Gloucester-Mathews Habitat for Humanity chapter helps local families build and improve affordable housing through home construction, repair, and sweat-equity partnerships.

Current Services for Covered Populations

Habitat serves low-income families, seniors, and individuals with disabilities seeking stable housing.

- Affordable homeownership opportunities
- Home repair and accessibility modifications
- Application assistance and financial counseling
- Collaborations with social services and broadband teams for in-home tech support and telehealth readiness

■ Mathews County Public Schools

Contact:

School Board Office

9864 Buckley Hall Road

Mathews, VA 23109

(804) 725-3909

www.mathews.k12.va.us

History & Mission

Mathews County Public Schools (MCPS) is committed to fostering academic excellence, responsible citizenship, and lifelong learning in a safe and inclusive environment. Serving a rural and tightly-knit community, the division prepares students to thrive in an increasingly digital and interconnected world while addressing local workforce and civic needs.

Current Services for Covered Populations

MCPS supports students from low-income families, rural areas, and households with limited access to broadband, technology, and digital literacy. The school system actively collaborates with community partners to enhance digital readiness and equitable learning opportunities.

- 1:1 Chromebook program for K–12 students
- Participation in T-Mobile's Project 10Million for qualifying students
- Free/reduced breakfast and lunch for eligible families
- Special education services and IEP support
- Career and Technical Education (CTE) pathways including IT, nursing, and trades
- High school internet hotspots and limited digital literacy instruction
- Coordination with the local library and digital equity taskforces for shared access initiatives
- Counseling and referral services for students in crisis or housing instability

- West Mathews Community League

Contact:

P.O. Box 234

Mathews, VA 23109

(804) 725-9797

History & Mission

West Mathews Community League fosters civic engagement, education, and cultural preservation for residents of the county's western peninsula. It serves as a gathering place for events and advocacy.

Current Services for Covered Populations

The League supports rural residents through access to community services, public education, and outreach.

- Community event hosting and space rental
- Support for broadband access and tech adoption advocacy
- Coordination of transportation, health, and civic information
- Volunteer hub for senior and low-income resident support

- Riverside Mathews Medical Center

Contact:

9866 Buckley Hall Road

Mathews, VA 23109

(804) 725-9440

www.riversideonline.com

History & Mission

Riverside Mathews Medical Center provides full-spectrum outpatient and urgent care to residents of Mathews County, as part of the larger Riverside Health System.

Current Services for Covered Populations

West Mathews Community League

Contact:

P.O. Box 234

Mathews, VA 23109

(804) 725-9797

History & Mission

West Mathews Community League fosters civic engagement, education, and cultural preservation for residents of the county's western peninsula. It serves as a gathering place for events and advocacy.

Current Services for Covered Populations

The clinic supports aging individuals, low-income patients, and those with limited transportation or digital health access.

- In-person and telehealth appointments
- Referral services to Riverside specialists and hospitals
- Preventive screenings and chronic disease support
- Enrollment help for insurance and MyChart online portal
- Coordination with DSS, nonprofits, and digital navigator programs

■ Gloucester–Mathews Care Clinic

Contact:

6031 Industrial Drive, Mathews, VA 23061

(804) 210-1368

info@gmcareclinic.com

https://gmcareclinic.com

History & Mission

Founded in 1998, the Mathews-Mathews Care Clinic is a nonprofit free clinic that provides high-quality healthcare to uninsured and underinsured residents of Mathews and Mathews. Its mission is to increase health equity by removing financial and access-related barriers.

Current Services for Covered Populations

The clinic serves low-income adults, aging residents, and individuals with chronic health needs. While its health model is inclusive, it lacks digital telehealth capacity and remote service navigation.

- Medical, dental, and pharmacy services for eligible residents
- Medication assistance and referrals to specialists
- No-cost chronic disease management programs

- Health education and wellness coaching
- In-person only; no telehealth or remote appointment booking

■ Hampton Roads Community Action Program (HRCAP)

Contact:

2410 Wickham Avenue, Newport News, VA 23607

(757) 247-0379

resourcedevelopment@hrcapinc.org

https://hrcapinc.org/

History & Mission

HRCAP is a certified Community Action Agency serving Mathews, Norfolk, Suffolk, Chesapeake, Mathews, and Franklin County. Its mission is to help low-income families become self-sufficient and economically stable through direct services and systemic change. It brings services directly to clients through satellite sites and virtual platforms.

HRCAP has also conducted their own Regional Digital Opportunity Plan, where they plan to build capacity to support various digital equity initiatives. This includes:

- Establishing a Connection Coalition, made up of community-based organizations, educational institutions, municipal departments, housing authorities, and private sector partners, including ISPs that can provide input on community issues and plans of action.
- Deploy Digital Navigators as a regional resource to help guide digital adoption programs and meet people face-to-face
- Expand their digital literacy curriculum that is enabled by Northstar Literacy
- Partner with Endurance IT to provide technical support services physically and remotely through establishing a support helpdesk

Current Services for Covered Populations

Serving multiple covered populations, including low-income households, children, seniors, veterans, and people with disabilities, HRCAP offers:

- Early childhood education (Head Start/Early Head Start)
- Weatherization, utility, and rent assistance
- Workforce development and case management
- Device and broadband support: Part of the Mayoral Digital Equity Coalition, HRCAP assists eligible families in enrolling in subsidy programs and setting up internet in the home.

- United Way Virginia Peninsula

Contact:

101 York Crossing Road , Yorktown, VA 23692

757-229-2222

info@uwvp.org

https://www.uwvp.org/

History & Mission

United Way of the Virginia Peninsula (UWVP) is part of the broader United Way network, serving Mathews, Hampton, Newport News, Poquoson, York County, James City County, and Williamsburg. Its mission is to improve quality of life by advancing health, education, and financial stability across the peninsula through collaboration with businesses, government, nonprofits, and volunteers. UWVP manages the Community Assistance Network (CAN), which connects residents facing poverty-related crises to essential resources.

Current Services for Covered Populations

United Way of the Virginia Peninsula supports low-income households, veterans, aging individuals, and those facing economic hardship. Though not a direct provider of digital resources, UWVP plays a coordinating role in resource navigation and community referrals:

- Community Assistance Network (CAN): case advocates help residents connect to housing, health care, food, and income support, including digital navigation referrals
- Volunteer matching and partnerships with local agencies providing device access, tutoring, and affordability programs
- Convening role in regional networks addressing ALICE households and poverty prevention
- Coordination of financial stability initiatives such as tax-prep assistance, job training referrals, and benefits counseling—often delivered via digital platforms but with limited on-site tech support
- Bilingual intake services (Spanish) for CAN, improving inclusion for non-English speakers

- PCs for People

Contact:

1933 E Pembroke Ave, Hampton, VA 23663

(804) 600-4322

virginia@pcsforpeople.com

https://www.pcsforpeople.org/locations/hampton-va/

History & Mission

PCs for People is a national nonprofit social enterprise with the mission of repurposing donated technology to bridge the digital divide for low-income individuals, families, and nonprofits. They collect devices from local government and businesses, distributing them to those who are in the most need, and selling them at greatly reduced rates to those who qualify. They plan to open multiple satellite distribution sites with community partners.

PCs for People recently opened their new location in Hampton VA, with the goal of bridging the digital divide for underserved communities across Hampton Roads and the state. They are supported by various donors and partners, including ABC Company, Meta, Cameron Foundation, Birdsong Peanuts, and DEFG Company.

Current Services for Covered Populations

Serving multiple covered populations, including low-income households, veterans, seniors, individuals with disabilities, and rural residents, PCs for People offers:

- Refurbished devices: Affordable desktops/laptops with a one-year warranty, for individuals and nonprofits
- Low-cost internet plans: Unlimited mobile hotspot plans (4G/5G LTE) starting at $10–15/month, with no credit checks, targeting under-connected households
- Digital learning center & support services: Video tutorials and one-on-one troubleshooting assistance help users build digital skills
- E-waste recycling: Responsible technology recycling services for businesses and institutions, contributing to sustainable digital access

■ VA Tech for Troops

Contact:

4840 Waller Rd, Richmond, VA 23230

(804) 521-7979

https://techfortroops.org/

History & Mission

A nonprofit launched in 2020, VA Tech for Troops equips U.S. veterans and military families with devices, training, and digital mentorship to support employment and connectivity.

Current Services for Covered Populations

Targeted at veterans and military families, the program provides:

- Refurbished laptops/tablets and broadband setups.
- Resume workshops, career training with digital tools, and job application support.

- One-on-one digital mentoring for telehealth and remote work navigation.
- Satellite sites that host 'game nights' where veterans can combat isolation by getting together with peers and enjoy various activities.

■ Three Rivers Health District – Mathews County Health Department

Contact:

536 Church Street, Mathews, VA 23109

P.O. Box 26, Mathews, VA 23109

Phone: 804-725-7131

History & Mission

The Three Rivers Health District is one of Virginia's 35 public health districts and serves ten counties across the Northern Neck and Middle Peninsula, including Mathews County. Its mission is to protect and promote community health through preventive services, environmental safety, disease surveillance, and health education.

Current Services for Covered Populations

Serving a diverse population across rural and semi-rural communities, the district provides:

- Clinical Services & Immunizations: Vaccinations for children, preteens, teens, and adults to address communicable disease prevention.
- Environmental Health Oversight: Inspection and enforcement for water safety, food establishments, septic systems, and related public health infrastructure.
- Community Health & Nutrition Support: Program guidance on healthy lifestyles, nutrition, and maternal–child health—often delivered via partnerships with local agencies.
- Emergency Preparedness & Disease Surveillance: Leading local response to public health threats, outbreaks, and emergencies, and monitoring community health trends.

4.4.2 County and Regional Existing Device and Skills Programs

This section lists all available assets in the Mathews County pertaining to device and literacy access. While thorough, it is not exhaustive. Some programs will be mentioned in multiple sections if they provide different services. For the complete asset list (including non-digital resources for covered populations) and resource links, please see the Digital Opportunity Viewer and request the most current Asset Inventory Master List from the deliverables package or Broadband Telecom directly.

■ Affordability

Program	Organization Name	Organization Scale	Description

Affordable Internet Package	Verizon Forward	National	Low-cost package
Free Device and Internet	T-Mobile Project 10Million	National	Free internet and devices for students
Lifeline	Universal Service Administrative Company	Regional	Eligible consumers - survivors - can get up to $9.25 off the cost of phone, internet, or bundled services. Can also provide a free phone to those who qualify.
Low Cost Internet Package	Access from AT&T	National	Low-cost package with free Wi-Fi
Payment Assistance Policy	Starlink	National	Application to qualify for reduces internet pricing
Telehealth and Device Program for Veterans	VA Telehealth Services	Regional	Brings high-quality care to Veterans wherever they are, with device loans and affordability programs, as well as tech support.
Wi-Fi to Go!	Mathews Memorial Library	Locality	Device rental program from library

■ Access

Program	Organization Name	Organization Scale	Description
Free Device and Internet	T-Mobile Project 10Million	National	Free internet and devices for students
Low Cost Internet Package	Access from AT&T	National	Low-cost package with free Wi-Fi
Telehealth and Device Program for Veterans	VA Telehealth Services	Regional	Brings high-quality care to Veterans wherever they are, with device loans and affordability programs, as well as tech support.
Wi-Fi to Go!	Mathews Memorial Library	Locality	Device rental program from library
Access Virginia C.A.R.T, Captioning, and Descriptions	Access Virginia	Regional	Provides open captioning and audio description at live theatrical performances so that Deaf/Hard of Hearing and Blind/Visually Impaired persons
FindHelp.Org Resource Locator	FindHelp.Org	National	Allows people to filter available services by their specific demographic and needs to find suitable resources, ranging from unemployment assistance, to auditory care and much more
Line Extension Customer Assistance Program (LECAP)	Department of Housing and Community Development	Regional	State subsidy for long drop line extension assistance for households with high special construction provider estimates
Telehealth Technical Assistance	Mid-Atlantic Telehealth Resource Council	Regional	Develops resources to support the growth of telehealth, with a particular focus on providers serving rural and communities

			where access to quality healthcare is limited
Telemedicine and Internet Access	Walter Reed Nursing and Rehabilitation Center	Regional	A facility that focuses on memory care and offers amenities.
Telemedicine Option	Gloucester Mathews Care Clinic	Regional	Remote appointments
Library Services and Digital Literacy Classes	Mathews Memorial Library	Locality	Offers public computers, 'Digital Branch', which provides e-resources, e-book, and audio book rentals, and digital literacy classes

■ Adoption

Program	Organization Name	Organization Scale	Description
Telehealth and Device Program for Veterans	VA Telehealth Services	Regional	Brings high-quality care to Veterans wherever they are, with device loans and affordability programs, as well as tech support.
Access Virginia C.A.R.T, Captioning, and Descriptions	Access Virginia	Regional	Provides open captioning and audio description at live theatrical performances so that Deaf/Hard of Hearing and Blind/Visually Impaired persons
FindHelp.Org Resource Locator	FindHelp.Org	National	Allows people to filter available services by their specific demographic and needs to find suitable resources, ranging from unemployment assistance, to auditory care and much more
Telehealth Technical Assistance	Mid-Atlantic Telehealth Resource Council	Regional	Develops resources to support the growth of telehealth, with a particular focus on providers serving rural and communities where access to quality healthcare is limited
Library Services and Digital Literacy Classes	Mathews Memorial Library	Locality	Offers public computers, 'Digital Branch', which provides e-resources, e-book, and audio book rentals, and digital literacy classes
Arts for Learning Virtual Arts Services	Arts for Learning	Regional	Provides a substantial range of educationally linked, hands-on and interactive arts experiences, with a learning program that can be delivered digitally to instructors, for a fee
Healthier757 Digital Health Literacy Programs with EdLogics	Birdsong Health Literacy Center of Excellence	Regional	Provides a free resource for many digital health focused trainings
Online resource for legal services and advice for Virginians	VALegalAid.org	Regional	Provides complete, accurate, up-to-date information on poverty law issues in an interactive and easily accessible format. The

			intent is to allow access to this information by legal aid attorneys, probono attorneys, clients, advocates and providers of services to legal aid's traditional client base.
Veteran Community Events - Physical and Digital	VA Tech for Troops	Regional	Empowers the under-resourced Veterans and their families by providing sustainable lifelong digital skills backed through training, education, and technology.
VITA - Tax preparation and financial literacy	LIFE Financial Assistance Organization, Inc.	Regional	Offers free tax preparation for families and individuals with $65,000 or less income with an option for virtual appointments
Literacy Volunteers of Gloucester, Inc	National Literacy Directory	Locality	In-person and online literacy instruction, as well as technology and math skill assistance. Tutors ESOL learners.
TRIAD Program	Mathews County	Locality	A cooperative effort of law enforcement agencies (police/fire/sheriffs), senior citizens, and senior organizations, focused on reducing crimes against seniors, including scams and fraud.
Telehealth and Device Program for Veterans	VA Telehealth Services	Regional	Brings high-quality care to Veterans wherever they are, with device loans and affordability programs, as well as tech support.
Access Virginia C.A.R.T, Captioning, and Descriptions	Access Virginia	Regional	Provides open captioning and audio description at live theatrical performances so that Deaf/Hard of Hearing and Blind/Visually Impaired persons

4.4.3 Needs Assessment – Where are the Service Gaps?

From examining the list of available resources, there appears to be some critical gaps in digital equity programming, including lack of particular support categories and shortfalls of some implementations when compared to National Digital Inclusion Alliance best practices.[108]

Despite having relatively high median household incomes and strong community institutions, Mathews County exhibits critical service gaps for vulnerable and geographically isolated populations. These gaps are shaped not only by income

[108] Browdy, C. A., Colletti, M., Desai, V., Gagne, R., Kauma, R. F., Kim, Dr. Y., Lindsay, A., McQuistion, L., Pitts, N., III, Community Technology & Technology Commission (CTTC), County of Austin, Ross, J., & Wittenzellner, M. (n.d.). *THE DIGITAL INCLUSION PROGRAM MANUAL*. https://www.digitalinclusion.org/wp-content/uploads/2024/07/2024-NDIA-The-Digital-Inclusion-Program-Manual-PUBLISHED-.pdf

disparities, but by the unique demographics of Mathews: a high percentage of aging residents, a large veteran population, and clusters of individuals with disabilities living in areas underserved by broadband or support services. While the county has strong community anchors, several digital equity best practices recommended by the National Digital Inclusion Alliance (NDIA) remain underdeveloped or absent.

- No formal Digital Navigator model - While partners like HRCAP offer Digital Navigators regionally, Mathews lacks a local Digital Navigator who provides one-on-one assistance for tech setup, troubleshooting, telehealth access, and benefit enrollment. Given the county's large elderly and disabled populations, and their reliance on hearing aids and assistive devices, this role is crucial.
- No structured digital skills pathway for adults - Mathews Memorial Library offers digital literacy classes and informal tech help, but the county does not offer a tiered, curriculum-based digital skills training system (beginner to advanced), especially for adults who are not in K-12 or college settings. This limits digital upskilling for veterans, seniors, job seekers, and individuals with disabilities. The library can also benefit from increased capacity to deliver these courses.
- Limited device access outside of K-12 programs - While Mathews County Public Schools have historically provided Chromebooks and hotspot support for students, there are no device distribution programs for low-income adults, aging residents, or returning citizens. Programs like PCs for People are not yet physically active in the county, and few residents are aware of existing external options.
- No community-based telehealth access points - Although Riverside Mathews Medical Center and the Gloucester-Mathews Care Clinic offer telehealth appointments, there is no private, public access location where individuals without home internet can attend virtual health visits. This is particularly concerning for seniors, veterans, and residents managing chronic conditions.
- No county-led ADA Title II digital audit or accessibility planning - Mathews lacks a countywide audit of its public-facing websites, digital services, and physical infrastructure (e.g., signage, ramps, hearing support systems). This oversight risks excluding residents with sensory, cognitive, or mobility impairments from accessing online services, public meetings, or emergency communications.
- Minimal support for residents with Limited English Proficiency (LEP) - Though small in number, Spanish-speaking adults (particularly in the Peary - Sarah tract) face cultural and language access gaps in digital services. There are no ESOL digital literacy offerings, translated tech guides, or Spanish-language support for online portals related to health, housing, or education.
- Lack of localized coordination for returning citizens - Inmates from Mathews are housed at the regional jail in Saluda, which offers tablet-based messaging and limited job readiness training. However, reentry support with a digital focus is nonexistent locally, and individuals returning to Mathews often lack the devices, skills, or service awareness to engage in online job applications or virtual services.

These gaps reflect a service landscape that is community-rich but capacity-limited. Institutions such as Mathews Memorial Library, the Mathews Resource Council, and Mathews County Public Schools serve as strong community anchors, but they are often expected to meet growing digital needs without dedicated staffing or system-level coordination.

Closing these gaps will require targeted investment, cross-sector partnerships, and strategic deployment of human-centered digital equity infrastructure. The next section of this plan will outline proposed projects to fill these gaps, including the establishment of a county Digital Navigator, a local device distribution hub, and ADA-focused accessibility improvements.

SECTION

05

IMPLEMENTATION ACTIVITIES AND KEYS TO SUCCESS

5.1 Suggested Projects

Telehealth Access Spaces in Mathews

Purpose and Background:

The Mathews County can consider establishing private, tech-equipped telehealth booths in Mathews Public Libraries and Recreation Centers. These booths, referred to as Telehealth Access Points (TAPs), will offer community members secure, high-quality virtual access to healthcare providers and relevant devices. On-site staff or digital navigators will provide technical assistance as needed.

This project directly addresses barriers to telehealth adoption among covered populations, including seniors, low-income individuals, veterans, and people with disabilities, by eliminating the digital, spatial, and connectivity constraints that prevent access to timely medical care.

Informed by national best practices from the NDIA, the American Library Association, and recent academic research on library-based telehealth pilots, this project represents a scalable model for equity-driven, community-centered digital health access. According to the Mid-Atlantic Telehealth Resource Council (MATRC), lack of proper scheduling and alerting systems is one of the biggest challenges to support telehealth spaces, so libraries and recreational centers that implement this already are the best fit for a community. Resources and technical assistance will be provided by working with the Mid-Atlantic Telehealth Resource Council. In turn, the County can provide space for them to host a regional telehealth summit/instructional seminar.

Project Objectives:

- Provide private, HIPAA-compliant booths where residents can attend telehealth visits with primary care, behavioral health, and specialist providers.
- Offer on-site technical assistance from trained staff or digital navigators for users unfamiliar with virtual care platforms.
- Reduce missed or delayed appointments among vulnerable populations due to lack of digital access through pre-established scheduling and alerting systems.
- Demonstrate libraries and rec centers as essential infrastructure for digital public health delivery.

Scope of Work:

Included:

- Installation of at least 1 - 2 telehealth pods in high-traffic Mathews libraries and recreation centers.
- Internet-connected, soundproof booths with video conferencing equipment, medical peripherals (as needed), and real-time support software.
- Staff training in HIPAA basics, device setup, platform navigation, and user support. Possibly have Riverside Hospital staff assist in onboarding and training, as well as giving periodic classes on telehealth access.

- Partnership agreements with Sentara Virtual Care and VA Telehealth Services (or other willing community partners) to integrate provider platforms and loan medical tablets where needed.
- Outreach, marketing, and scheduling coordination for priority populations (e.g., seniors, Medicaid users, veterans).
- Evaluation and data tracking system to measure impact and report outcomes.

Budget Categories:

- Telehealth pod equipment & soundproofing
- Internet connectivity and bandwidth upgrades
- Training for staff/digital navigators
- Software licensing / platform integration
- Outreach materials and multilingual guides
- Evaluation and reporting costs

Deliverables:

- 2 Telehealth Pods installed, secure, and operational at designated public sites.
- Navigator Protocol Guide to support users before and during telehealth visits.
- User Orientation Materials in multiple languages and formats.
- Outreach Strategy Plan targeting seniors, low-income families, and veterans.
- Quarterly Evaluation Reports detailing usage data, outcomes, and testimonials.

Success Metrics:

Metric	Target
Telehealth visits facilitated monthly	25+
% of visitors requiring technical assistance	≥ 30% (initial), decreasing over time
Reduction in missed appointments among users	≥ 25% reduction by Month 6
User satisfaction rate	≥ 90% report “satisfied” or “very satisfied”
% of repeat users or referrals	≥ 40% of first-time users return or refer

Sustainability Plan:

- Pursue annual funding and partnerships with local hospital systems and MATRC.
- Train library staff and navigators to manage daily operations.
- Seek in-kind donations from regional healthcare providers for equipment upgrades.

Community Digital Navigator with Digital Literacy Focus

Purpose and Background:

Mathews, and by extension the Middle Peninsula region, currently lack a dedicated Digital Navigator that can provide face-to-face guidance and tech support with covered populations in the County. They will connect these individuals with resource discovery, device setup, and represent the County's Digital Opportunity initiatives, as well as lead the community coalition to implement the processes laid out in The Mathews County's Official Digital Opportunity Plan, as well as those of Mathews and Mathews. Mathews Libraries, as well as others in the region, lack structured digital literacy classes, so this individual will also develop curricula and specialized workshops to educate residents on their most perceived digital skill needs, as well as identify the best self-guided platform.

Ideally, this individual will be regional and centrally base wherever space can accommodate, primarily in either Mathews or Mathews. Additionally, this person should be qualified to instruct digital literacy curriculum covering basic computer skills other software, such as Microsoft Office, and should at least be bilingual in Spanish. This position could also be staffed by an outside entity, such as HRCAP or PCs for People, and contracted to the county or region through regional Memorandum of Agreement (MoA).

Project Objectives:

- Provide individualized tech support to at least 100 residents per month across public libraries, rec centers, and community partner sites in region.
- Deliver structured digital education via a three-level curriculum: Basic, Career, and Advanced, related to basic computer skills, software navigation, and other important topics such as Artificial Intelligence and scam avoidance.
- Enroll eligible households into ISP affordability programs.
- Improve residents' digital self-sufficiency, job-readiness, and civic access through coaching and individual tech support.

Scope of Work:

Included:

- Recruit and train a Digital Navigator stationed at library branches and partner sites.
- Deploy the Digital Navigator to deliver in-person and virtual literacy workshops, using platforms like Northstar, DigitalLearn, and Niche Academy, as well as self-developed curriculum with built-in credentialing and career skill tracks (e.g., Microsoft Office, LinkedIn Learning, Cybersecurity, Cloud Tools).

- Lead Mathews Digital Opportunity efforts, including coalition building and demographic data research and updates according to the framework laid out in The Mathews County Official Digital Opportunity Plan and other locality or regional plans.

Success Metrics:

Metric	Target
Clients served monthly	100+
ISP affordability enrollments supported	300+ per year
Digital skill improvement (pre/post assessment)	80% have improved scores
Client satisfaction	≥ 90% "Satisfied" or better

Sustainability Plan:

- Pursue funding via Mathews annual IT budget allocation, local economic development allocations, and philanthropy/community donations. If regional, pursue an MoA and have each county budget for this position or share the cost of contractor.
- Integrate into Mathews and regional libraries' long-term service model, with permanent staff and rotating volunteers.

Community Device Bank

Purpose and Background:

The Mathews Community Device Bank will serve as a countywide initiative to collect, refurbish, and distribute free or low-cost desktop computers, laptops, tablets, and mobile devices to income-constrained and qualifying residents.

While internet service and digital literacy programs are expanding, many households in Mathews still lack basic access to a functional device, limiting their ability to apply for jobs, attend virtual classes, access telehealth, or manage digital paperwork. This project ensures that device ownership is no longer a barrier to digital opportunity, specifically through affordability measures.

The project will utilize an organization such as PCs for People for providing technical refurbishment and procurement, inventory systems, and distribution. VA Tech for Troops can also support device refurbishment and outreach specifically for veterans and potentially contribute refurbished stock. Additionally - Mathews or a regional community partner can identify spare building space to set up a satellite center, where a Digital Navigator can be placed as personnel and conduct their work there as a main office, while these organizations also have personnel (or utilize the Digital Navigator) to help with distribution. Tech for Troops can also run LAN parties and get-together events in this space.

Project Objectives:

- Distribute at least 300 devices annually to eligible low-income residents, including veterans, seniors, students, and individuals in public housing.
- Establish a sustainable satellite partnership with PCs for People to create a Mathews-based distribution node.
- Provide device setup support, warranty options, and ongoing tech assistance in collaboration with the Mathews Digital Navigator.
- Reduce the number of device-dependent households in Mathews relying solely on mobile phones.

Scope of Work:

Included:

- Establish a collection and inventory tracking process for donated or retired county/business devices.
- Formalize a Mathews distribution satellite in partnership with PCs for People, serving as a direct distribution location.
- Recruit Digital Navigators to assist in device setup and configuration at the point of distribution.
- Bundle devices with affordable connectivity, have ISPs use the shared space to promote their services and affordable packages/sign-ups.
- Track device condition and impact through follow-up surveys and diagnostics.

Device Eligibility Criteria:

- Household income < 150% of federal poverty level or participation in federal assistance (e.g., SNAP, SSI, Section 8, VA benefits, free/reduced lunch)
- Residents lacking a functional desktop, laptop, or tablet
- Special emphasis on veterans, students, job seekers, and older adults (or really any covered population)

Deliverables:

- A functioning Mathews-based device distribution node via a partnership with PCs for People in a community space
- A countywide collection and intake protocol for retired devices from businesses, local government, and schools
- Outreach campaign targeting underserved neighborhoods and community partners
- Device bundles may include: refurbished laptop/tablet, carrying case, software, basic warranty, and affordable package enrollment support

Success Metrics:

Metric	Target
Devices distributed (annually)	300+
% functioning 6 months post-distribution	≥ 90%
% of recipients who report improved internet use	≥ 70%
% of recipients who report improved job search, education, or telehealth access	≥ 60%
# of veterans, seniors, or students served	Tracked and benchmarked by quarter
Device return/recycling compliance rate	≥ 95% under warranty expiration terms

Sustainability Plan:

- Maintain ongoing inventory through donation drives and MOUs with public institutions to donate retired devices – managed by a partner such as PCs for People.
- Integrate affordable package sign-ups and follow-up surveys into navigator workflows.
- Explore fee-waived device upgrade programs after 12–24 months with continued partner support from PCs for People.
- Seek continued support through grants, philanthropic funding via regional foundations, business and healthcare system donations.

Next Steps

- Draft MOU with PCs for People to formalize Mathews as a satellite distribution point.
- Launch marketing campaign targeting public housing, senior centers, and job training programs.
- Develop device pickup calendar aligned with library events and navigator drop-in hours.
- Begin baseline data collection to monitor program impact across covered populations.

Expanded Digital Literacy Series

Purpose and Background:

This initiative will empower Mathews County residents to better understand and access local, state, and federal services online, as well as general digital skills based on the current trending needs as identified by the County. With an increasingly digital government infrastructure, from DMV transactions and Medicaid renewals to legal aid and voting registration, many residents, especially those from covered populations, face barriers due to lack of digital skills, confidence, or access to support. The Mathews Memorial Library offers basic courses but lacks education for more advanced topics such as AI usage

and scam avoidance. Instructor can also bring awareness to other aspects of the digital divide, such as existing affordability programs and practices and help determine best approach (which package to subscribe to) for individual needs.

This project will address the growing disconnect between critical public services and the digital readiness of residents by creating a structured, repeatable training program hosted at trusted community venues such as libraries and community centers. The training will not only improve users' technical literacy, but foster civic participation, self-advocacy, and awareness of available resources. The series will be delivered through rotating workshops and can be scaled or adapted by trained partner organizations, which is preferred to address the lack of available staff to conduct these workshops currently.

Project Objectives:

- Deliver a recurring civic-focused digital skills series that helps residents confidently access and engage with public services.
- Adopt a self-guided digital literacy platform from an existing digital literacy provider or created by a partner organization.
- Train partner organizations and volunteers in the delivery of the content to ensure long-term sustainability and scalability.
- Increase successful enrollments in essential government programs (e.g., CommonHelp, DMV, IRS e-file, Medicaid, voter registration).
- Reach at least 200 covered population participants within the first year across all partner sites.

Scope of Work:

Included:

- Develop a core curriculum with a focus on modern internet considerations and more advanced skills.
- Find a suitable digital literacy provider and promote the service for residents.
- DSS will host workshops at libraries, senior centers, public housing sites, and DSS locations.
- Offer live instruction and one-on-one support during or after each session.
- Print materials in English and Spanish, with on-demand translation services available.
- Distribute participant packets with guides, login checklists, and FAQ sheets.
- Track participant progress and post-training outcomes via pre/post assessments.

Deliverables:

- Fully developed training materials (slide decks, handouts, checklists)
- One 4-part public workshop series delivered each quarter across multiple sites
- Training-of-trainers manual and train-the-trainer sessions delivered to local partners
- Monthly schedule and registration system for sessions across Mathews

- Civic toolkit webpage and downloadable packets on library/DSS websites or Digital Opportunity webpage

Success Metrics:

Metric	Target
# of residents participating in training series	≥ 200/year
% of participants who complete all 4 modules	≥ 70%
% of participants who register for at least one .gov portal	≥ 60%
# of partners certified to deliver content	≥ 15
% of participants who report increased civic confidence	≥ 80%
Participant satisfaction rate (post-workshop)	≥ 90%

Sustainability Plan:

- Create open-source versions of all training materials for local reuse
- Incorporate the program into library programming, adult education centers, and DSS outreach initiatives
- Collaborate with local nonprofits, schools, and advocacy groups to embed civic modules in other digital skills programs
- Seek recurring support from civic engagement grants, philanthropic partners, and regional digital equity consortia

Next Steps

- Finalize curriculum and translate materials
- Conduct train-the-trainer workshops for Mathews Public Library, DSS, and Care Clinic staff
- Publicly launch workshop series with calendar published across county partner channels
- Promote registration through VEC, housing authorities, and senior centers
- Evaluate first round of programming and adjust content and delivery as needed
- Begin quarterly reporting to track civic access metrics and refine expansion plan

Smart Tiny House Initiative

Purpose and Background:

The Smart Tiny House Initiative is a collaborative, cross-sector effort that embeds broadband-enabled workforce training and digital literacy engagement within the public school system, while extending these benefits into the broader Mathews County community. Mathews County Public Schools (MCPS), in partnership with Mathews Memorial Library and other local stakeholders, will design, build, and deploy a trailer-mounted smart home, equipped with broadband systems and IoT devices, to serve as both a hands-on training tool and a mobile outreach platform.

This project aims to address local gaps in digital skills, awareness, and broadband adoption by combining in-classroom learning with real-world demonstrations. It also empowers rural and aging populations—who often lack exposure to smart technology or private learning environments—to interact with digital tools in a tangible, approachable way. Once constructed, the home will be used year-round for public engagement at festivals, health fairs, and community events, and will help train both students and the general public in broadband-enabled living.

Project Objectives:

- Embed broadband systems training into the MCPS carpentry curriculum to prepare students for careers in connected construction and telecommunications.
- Deploy a mobile “tech petting zoo” to promote broadband adoption and digital literacy throughout Mathews County.
- Engage residents from NTIA-defined covered populations including aging adults, LEP individuals, and low-income households at county-wide events.
- Distribute educational resources and provide personalized support to promote participation in subsidy programs like the LECAP or Lifeline.
- Use the completed home to serve as a teaching and demonstration tool for partner organizations.

Scope of Work:

Included:

- Design and build a livable, trailer-mounted smart home, fully outfitted with broadband-enabled technology.
- Install and demonstrate devices including Starlink broadband, smart thermostats, health monitoring tools, smart speakers, and connected lighting.
- Coordinate pop-up digital literacy programming focused on smart device usage, telehealth navigation, and digital safety.
- Produce bilingual and ADA-compliant materials (including printed guides and signage).
- Survey event attendees and connect them with follow-up support through the library or Digital Navigator (if funded).
- Establish reinvestment plan to sell the home and fund subsequent build cycles, creating a self-sustaining program.

Deliverables:

- Fully constructed and internet-connected mobile smart home, completed by March 2026

- Inventory of 25+ smart home and broadband devices installed by MCPS students
- Six or more public digital literacy events hosted via the smart home annually
- Printed outreach materials (300+ packets distributed at events)
- Event signage, survey tools, and bilingual digital safety guides
- Monthly schedule of public appearances and demonstration events
- Student technical fluency evaluation tools and post-event community feedback forms

Success Metrics:

Metric	Target
# of students trained in broadband-enabled device install	≥ 30–40 per cycle
% of senior students participating in tech installation	100%
# of residents engaged through public events	≥ 150
# of covered population participants engaged	≥ 100
% of participants reporting increased comfort with tech	≥ 80%
# of residents taking follow-up action (class signup, ACP enrollment)	≥ 25
# of institutions requesting use of the house	≥ 3 annually
# of digital equity events where house is deployed	≥ 2 per year

Sustainability Plan:

- Sell completed house to reinvest proceeds in future build cycles
- Embed smart home system installation into the high school's CTE curriculum
- Partner with Mathews Memorial Library, DSS, and local nonprofits to co-host literacy events
- Use the home as a rotating teaching asset for regional digital equity initiatives
- Collect and report survey data for inclusion in the Mathews County Digital Opportunity Plan
- Seek support from rural development, workforce innovation, and broadband adoption grants

Next Steps

- Complete procurement and final design schematics for smart house and technology systems
- Begin construction and device installation with MCPS seniors (Fall 2025 – Winter 2026)
- Train library staff and partners on device demonstration and event protocols
- Finalize event calendar for deployment at community events starting Spring 2026
- Develop survey and feedback tools for event participants
- Launch evaluation dashboard to track outcomes and prepare for future funding proposals

ADA Title II Compliance and Accessibility Audit

Purpose and Background:

This project will support Mathews County's effort to become fully compliant with Title II of the Americans with Disabilities Act (ADA), which mandates that all public entities ensure equitable access to their services, programs, and facilities. While many rural counties operate legacy systems and facilities, a structured audit process is critical to identifying current barriers and prioritizing improvements.

The audit will include a self-assessment or formal engagement with an ADA-trained contractor to evaluate compliance across four major domains: website and digital services, facility access, policy frameworks, and programmatic availability (e.g., public meetings, emergency response, and communication methods). The project also aims to support staff training, community engagement, and grievance system improvements to ensure long-term compliance and empowerment for individuals with disabilities.

Project Objectives:

- Conduct a comprehensive ADA Title II self-evaluation or third-party audit of county services, programs, and facilities
- Develop a prioritized Corrective Action Plan and transition timeline for remediation
- Ensure digital and physical access to all government programs and emergency communications
- Update grievance procedures, signage, and public information to align with ADA and Section 508 best practices
- Identify accessibility improvements needed for high-use county websites and public buildings

Scope of Work:

Included:

- Website accessibility review using Web Content Accessibility Guidelines (WCAG) 2.1 Level AA standards (manual + automated tools)
- On-site evaluation of county facilities and physical spaces (e.g., ramps, doors, signage, restrooms, parking)
- Assessment of communication access during emergency responses and public meetings

- Policy review for grievance procedures, accommodations, and inclusive communication protocols
- Community stakeholder engagement, including outreach to residents with disabilities
- Drafting of Corrective Action Plan and budget estimate for remediation

Deliverables:

- ADA Self-Evaluation Report or Contractor-Prepared Compliance Audit
- Web accessibility assessment with prioritized list of remediations
- Facility checklist report with photos, compliance notes, and estimated cost ranges
- Updated grievance policy and ADA notice language for county communications
- Corrective Action Plan with compliance timeline and funding recommendations

Success Metrics:

Metric	Target
Facilities assessed	100% of all public-facing sites
County programs reviewed for accessibility	≥ 90%
WCAG 2.1 AA web accessibility compliance for core services	≥ 95% compliance score
Updated grievance procedures and ADA policy posted publicly	100% completion
Stakeholder interviews or outreach engagements completed	≥ 5 engagement events
Corrective Action Plan adoption by Board of Supervisors	Completed within 6 months

Sustainability Plan:

- Incorporate ADA compliance reviews into ongoing capital improvement planning and IT procurement processes
- Train key departmental staff on digital and physical accessibility practices
- Schedule recurring internal audits and re-assessment every 3–5 years
- Maintain a public-facing ADA webpage with resources, grievance forms, and transition plan status
- Explore partnerships with advocacy groups and Virginia Department for Aging and Rehabilitative Services (DARS) for compliance training and funding guidance

Next Steps

- Identify project lead from County Administration or Facilities Management
- Solicit contractor quotes for external ADA audit or develop internal audit framework
- Begin inventory of county-managed buildings, services, and online tools
- Launch ADA-specific community input form or focus group series
- Present proposed audit plan and budget to Board of Supervisors for adoption

VA Tech for Troops Satellite Facility

Purpose and Background:

This project will establish a dedicated VA Tech for Troops satellite facility in the underserved corridor between Bohannon and Fitchett's Wharf areas at a facility on Route 14, offering a safe, welcoming space for veterans to connect, socialize, and access digital and healthcare services. Mathews and surrounding rural counties have a significant veteran population, many of whom face geographic isolation, limited internet access, or lack of support in navigating benefits and modern telehealth systems.

The satellite center will host weekly or monthly gatherings that combine camaraderie with practical technology engagement. These events will incorporate game nights, tech learning sessions, and digital wellness tools to reduce loneliness and promote digital confidence. The site will also maintain veteran resource guides and offer assistance with VA benefits navigation, Connected Care enrollment, and telehealth support. This low-barrier, relationship-driven model complements regional mental health and digital efforts while honoring the service of local veterans.

Project Objectives:

- Establish a physical satellite site between Bohannon and Fitchett's Wharf areas at a facility on Route 14, as a veterans-only tech and support space
- Host structured veteran gatherings on a weekly or monthly basis for tech education, gaming, and peer support
- Provide one-on-one assistance with telehealth access, device usage, and VA Connected Care enrollment
- Offer up-to-date printed and digital resource guides covering VA benefits, local services, and veteran-specific digital platforms
- Reduce social isolation and technology anxiety among rural and older veterans

Scope of Work:

Included:

- Identification and setup of a secure, accessible community location centrally located in Mathews, close to Route 14
- Deployment of computers, Wi-Fi, and gaming consoles or laptops at the site (donated/refurbished by VT4T)
- Coordination of events such as game nights, instructional workshops, and resource presentations
- Development of veteran-specific tech guides, including VA systems (MyHealtheVet, VA Connected Care, ID.me, etc.)

- On-site support for VA telehealth and digital care navigation (with privacy and HIPAA compliance in mind)
- Optional registration or referrals to local mental health, housing, or digital literacy services

Deliverables:

- Fully functional VA Tech for Troops satellite facility with Wi-Fi, refurbished devices, and gathering space
- Regular event calendar (weekly/monthly) with scheduled gatherings and open tech support hours
- Printed and digital veteran resource guides tailored to regional service offerings
- Intake and referral system to connect veterans with telehealth, housing, or benefits navigation as needed
- Partnership MOUs with Mathews County, HRCAP, DVS, or regional VA service providers

Success Metrics:

Metric	Target
Number of veterans served per quarter	≥ 35
Number of gatherings or support events hosted annually	≥ 24 (2/month)
% of participants who enroll in VA Connected Care	≥ 50% of those eligible
% of attendees reporting decreased loneliness/isolation	≥ 70% (via post-event surveys)
% of participants referred to additional support services	≥ 60%
Site utilization and attendance rate	Benchmarked quarterly

Sustainability Plan:

- Coordinate with VA Tech for Troops to provide continued staffing, device donations, and event leadership
- Leverage partnerships with local nonprofits, DVS, and county officials for space, outreach, and in-kind support
- Encourage veteran volunteers to assist with peer mentorship and community engagement
- Track engagement and outcomes to support grant applications (e.g., V3, VDVS, or SCRC grants)
- Seek philanthropic or corporate sponsors to fund ongoing costs (e.g., refreshments, software, educational licenses)

Next Steps

- Identify available community space with ADA access and broadband connectivity

- Formalize MOU with VA Tech for Troops and other veteran-serving partners
- Develop monthly event schedule and list of resource topics to be covered
- Design print-ready veteran resource guide for Mathews and surrounding counties
- Launch soft opening with targeted outreach to local veterans, DAV, and VFW members

SECTION

06

RECOMENDATIONS

6.1 Planning Philosophy and Recommendations

This plan reflects a snapshot of time. One of the biggest aspirations of this process, and DEA funding as a whole, is to set the stage for states and localities to be aware of the importance of understanding where they are in service of their least served; specifically, to gain awareness of the pace of technological development and those groups that can easily be left behind. This is why the real 'meta' purpose of the creation of the plan is to be as instructive as it is informative. Simply put, this document, and the steps that were taken to create it should be a guide for the county to keep this work alive – as technology changes and become more and more ubiquitous, there will always be groups who struggle to keep up for various reasons; how the landscape of this looks today won't be the same as it is tomorrow. For example, as millennials age, it would be safe to assume that they would not struggle with digital adoption as much as previous generations, because they were the first to grow up using computers and search engines in their day-to-day. But in 30 years, imagine a scenario where many people have Augmented Reality goggles with embedded AI that stores reminders and memories – offloading a lot of the mental load that these tasks require. Much like how people are now reliant on GPS to navigate and don't remember directions (or even phone numbers due to contact logs), overreliance on this hypothetical tech could lead to not using these critical functions that are important to keep a sharp, healthy mind as one ages, and could lead to worse outcomes and greatly increase the risk of age related progressive memory diseases. In these cases, before too much harm is done, there should be interventions that reiterate the importance of 'using it before you lose it.' This, albeit speculative, is a potential example of the importance in keeping a finger on the pulse (as well as a broad perspective) on digital literacy.

Evolving issues like this is why it is important for localities, their leadership, and community serving organizations to work together in understanding the needs of their constituents. At its core, the main principles of this practice are collaboration, outreach, and visibility. These three tenants inform the framework of this plan, and the ways in which leadership must move forward. The following details important steps for local leaders, community partners, and even residents themselves, to upkeep with digital opportunity.

6.1.1 Local Leadership

1. Legitimize the initiative – and consider hiring specialized staff to take charge: This planning process struggled early on because of the novel and vague nature of the language around the grant, and need for county-endorsed branding. Once this issue was resolved through the creation of a locality webpage detailing the plan and its process, community partners and residents were more eager to respond to cold calls and emails, and well as opt into the survey. Additionally, an individual dedicated to this matter can be used for direct, on-the-ground literacy and adoption practices, such as filling in the role of a Digital Navigator or tech support.

   Since this process was conducted by a consulting firm, some community organizations were reticent to reach back out to a business that was not the County itself – there was a general impression that multiple parties would be pursuing the same grant funding, making this project *competitive* rather than *collaborative*. When this messaging comes from a direct County employee, it can help ease anxiety around competing for scare funding sources, understanding that the locality is directly backing the efforts of community partners in good faith.

2. Establish a locality based Covered Population GIS resource that is publicly available and keep asset mapping up to date: The maps shared in this plan, as well as the Digital Opportunity Viewer were created with the intent that these data sources would be periodically refreshed. ESRI publishes updated estimate data yearly, American Community Survey has estimates every 5 years (with some areas getting refreshed per annum), and Census data is available every ten years. These datasets should be examined and compared to prior years every so often to see how demographics change and respond

to factors. This data will also serve as the basis for community leader discussions in order to make informed decisions on how and where to serve constituents.

Additionally, as shared in Section 4, asset mapping of available resources is a major piece of providing equity in the spirit of visibility. Having a singular site that any person can freely access and get a feel for what resources are available to them greatly reduces the friction of having to find these services and opens up the doors for more beneficials impacts. This works both ways, as if more people are engaging with community partners, there is a greater likelihood they will be able to increase their capacity to serve through funding and local support. By keeping a living list of assets and resources and integrating it into public maps, localities can make an impact on both their constituents and community partners.

It would be remiss not to mention that DHCD is working on their own Digital Opportunity Resource platform as communicated through their Digital Opportunity Plan. If a locality does not have the capacity to develop its own public platform, it would be of consideration to set up a regular asset mapping and data sharing practice with the state so that there is visibility into locality specific resources. While there are benefits for a locality to have its own platform, such as being able to cater to more specifically the needs of constituents and approach marketing and design in tandem, a state-led resource with direct input from the locality can be seen as the next best option.

3. Build a local coalition that is focused on Digital Opportunity: Gather leadership and community leaders that both have a firm understanding of technology, and interface with vulnerable populations regularly. Create regular forums and gatherings where these individuals can meet, as well as the public, and discuss contemporary issues. Consider establishing a 'Resource Council', where community organizations can meet and have digital opportunity as a tentpole item of discussion. Include institutions such as locality level Information Technology and Social Service departments, libraries and recreation centers that have public spaces, community action groups, and other organizations that may not yet have a firm grasp on technology related initiatives but cater to least-served constituents already in some capacity.

   As learned from this first go, it is difficult to coordinate so many separate groups to meet consistently. Not being afraid to meet one-on-one is key, as well as being flexible enough to meet everyone's schedules. These discussions need to be structured, data-driven, and focused with the intention to produce actionable results. Also consider how technology is used in the community through the IT department and find opportunities to advocate for projects that expand public access to Wi-Fi, solar-enabled lighting, and other things that relate to high-priority issues.

4. Conduct regular outreach through surveys and input sessions: For this project, a survey was created to assess residents' issues with affordability, adoption, and literacy levels (which can be seen in Appendix A). Even though there were multiple methods of outreach conducted, and the survey was incentivized by randomly awarding a $250 gift card, the level of response was just 47 individuals. With more focused marketing efforts by the County, such as the possibility of direct mailers, or placement near voting locations. Also, if this practice is done periodically and marketed as such, with direct, proven, and actionable results from citizen input, it could be a ubiquitously celebrated practice that residents are happy to partake in every couple of years. Importantly, the survey, once established and anticipated, can serve as a tool that also spreads visibility and awareness of existing plans and resources through intentionally crafted questions. For example, in the survey conducted for this plan, there is a question about affordability programs that can lead more people to learn about the Lifeline and LECAP programs. If created through a location based platform such as ESRI Survey123, these responses can also be integrated into the Digital Opportunity Viewer mapping tool.

   Note: a text-based copy of the question used in this survey has been included in the deliverable package with this plan.

   DHCD's plan lays out their statewide approach that can be replicated on a smaller scale. In addition to the regular survey, consider following the same five prongs to engage residents:

   1. Community input sessions;

2. Conducting 1:1 stakeholder interviews;

3. Conducting broadband centric focus groups;

4. Counties and Cities with Existing Digital Opportunity Efforts; and,

5. Forthcoming Public Comment on this and subsequent plans.

Some of these practices require greater intentionality to be effective; for example, a focus group can be used to gain feedback before the implementation of specific community programs or pilots. Leaders truly focused on this should look for opportunities to implement and spread visibility at each occasion, particularly through community events, economic development meetings, and when establishing partnerships, especially with internet providers. For example, if a letter of support is required from a locality to give a provider extra scoring points for a grant application, consider agreeing upon conditions, such as a required deployment of signage for their low-cost offerings in neighborhoods, with multi-language signs available in areas determined by demographic mapping.

5. Reframe the conversation; intentionally design projects and programs for the greatest impact: When devising projects and community resources, keep in mind disadvantaged groups that would benefit those who might have trouble with accessibility. Consider implementing an American with Disabilities Act Title II audit through a self-assessment or contractor to understand how existing available digital and physical resources may be inaccessible to current people and develop a remediation strategy. Make sure that where appropriate, public resources and signage are developed with low-literacy individuals in mind, relying on basic English and appropriate pictures to assist. Also, include other language versions of available documents that are translated by a natural speaker, not AI.

   In more broader aspects, the conversation about digital opportunity, or 'digital equity' may still be a bit touchy. When communicating, focus on specific needs, their current effects and potential outcomes if remediated, and be sure to have a strong perspective and conviction for implementation. If 'Digital Opportunity' is still too obscure to reach people, encompass these practices by describing them as solutions to combat the non-physical aspects of the 'Digital Divide'. Cutting through the weeds of dialogue through materially delivering for people is the fastest way to turn them from skeptic to advocate. When dealing with parties that may be more difficult to assuage (or even those who you anticipate might not care about the public service aspect), consider reframing the conversation of access and adoption to 'ways to increase take-rate'; communicate that demographic analysis and serving these individuals through programs can help onboard harder to penetrate groups and have them opt into services and platforms that may entertain, educate, and ultimately open up consumer pipelines. If this type of messaging is what is needed to open up resources, the ends may justify the means.[109]

6. Keep a running list of potential projects to implement, as well as grant resources from federal, state, and regional entities: In order to truly make an impact, data and discussions need to be translated into actionable projects, specifically ones that are attuned to specific needs of the community. This should be a prominent fixture of coalition discussions, serving as sort of a 'think-tank' to understand available capacity and willingness to pursue solutions that are catered to relevant issues. A running list of grants and available or upcoming funding opportunities, as well as eligibility requirements should be compiled and discussed as well, especially if local funding is limited. In the case of competitive grants, community organizations can partner on solutions or put in separate applications with the unbiased help of local leadership. Local leadership should keep a list of organizations and running opportunities and set up notifications for visibility. The current state of funding for these types of projects is tenuous, but leaders should look to regional organizations, such as the

[109]Plus, equity under a financial context is nicer for some to hear than the alternative. Investing in 'digital equity' may lead to increased 'asset equity' by service providers. Be savvy when coming up with 'marketing'.

South Crescent Regional Commission, or local Planning District Commissions for funding avenues. Meetings with leaders from State Departments and DHCD to keep track of changes of programs, eligibility, and offerings should be regular. For example, it is crucial to spread awareness of DHCD's programs such the Community Development Block Grant (CDBG) last-mile program, and expansion assistance via the Appalachian Regional Commissions (ARC), Utility Leverage Program, and Line Extension Customer Assistance Program (LECAP). Also, keep track of the development and updates (or rollbacks) of new resources, such as Virginia's Gold Standard Digital Hub or DHCD's Digital Opportunity tool. In a proactive manner, a running list of implementation projects can also be developed and shared in the effort to support their deployments when a suitable organization has enough capacity and funding, or when a relevant funding opportunity arises. These projects should be realistic and grounded, but not afraid to incorporate imagination and ambitiousness as seems fit. They should also have distinct metrics for success that are defined at the outset.

6.1.2 Community Partners

7. Re-examine existing programs and services to find avenues to include digital resources: Look for ways to implement digital opportunity aspects into existing programs. For example, if you offer a Veteran housing assistance, see if you can include a temporary internet subscription subsidy in accordance with providing them visibility to low-cost options. Doing so may open up avenues for potential funding sources that specifically look for these types of practices to support.
8. Be bold, branch out and look for partners that can introduce synergistic solutions: Think about how you can take your current service model and expand it to other groups that you may not currently serve, but have an identified need through discussions with local leadership and other community organizations. For example, you may specialize in working with schools to fund the setup of computer labs for students but there may be an opportunity to also implement a lab at a local prison lacking sufficient, modern infrastructure. This may be more difficult for some organizations, but being open-minded and willing to create custom solutions alongside other partners may open up support from unexpected sources.
9. Lean on local leadership and other partners: Keep up with administrative changes in personnel or procedures in order to keep your services and resources up to date. Entertain heeding any calls-to-action by community leaders, especially for something like a digital resource coalition or public comment and be ready to participate in discussions and project development. If your organization isn't currently able to support capacity for an anticipated project, these partners may be able to assist.

6.1.3 Residents

10. Don't be afraid to ask for help: Please do not be afraid to look for help and available resources, especially if you are in dire need. These things are available to be used, and if you think they can have a real effect on your wellbeing and quality of life, pursue them. Reach out to organizations that serve your specific demographics, including community partners listed in this document and local leadership. Keep track of developments with the County's Digital Opportunity practices through this webpage: broadband4mathews.info/digital-opportunity/. Ask questions on timelines and availability. You may find that there are more people who are willing to help than you may assume.
11. Stay vigilant – don't fall into common traps online: It is important to remember that using the internet and digital services requires awareness of things such as potential scams and misinformation. Look out for phishing scams, which nowadays are very sophisticated and convincing. Beware of pop-ups and requests for information, and do your homework before responding to random accounts, emails, requests , or even making online purchases. The dark side of convenience is that it closes the gap between people and old things that would help them make better purchasing decisions – time and

distance. When you can buy something in one click and don't have to travel to a store, you may end up with more packages on your doorstep and less money in your bank account.

Be careful to not fall into rabbit holes and polarization – even though it may feel good, make sense to you and explain away things that you might have already had a suspicion about, it is important to remember that some of these platforms operate on that exact level: to maximize your engagement (screentime, swipes, likes, etc.), instill emotions in you, and ultimately make it easier to sell you products and ideas. Technology, and by extension, social media, are tools, but understanding the true agenda of some of these companies are some of the things just mentioned is empowering in itself. Ultimately, this is a false sense of community and connection, and engaging in real community, forming real connections is what will improve the wellbeing of you and your neighbors. Technology is moving faster than most can keep up with – and the advent of AI-generated deepfakes and pseudo-journalistic news articles make it so much more difficult to know what is real or not. While the community can help provide training for these skills, ultimately, it falls on you to understand how to critically engage with what is real information and what is noise.

12. Spread the word: As mentioned, connection is important. But if you have learned anything from this document, or from participating in your community or by receiving help from county departments and community partners, tell someone! Share the work with your neighbors, or people in your circle that could benefit from these resources. Share these links and documents with them. Put your voice into these sessions and have them do the same. The more people that use these resources, the more available they can become. Share your feedback at any opportunity and lookout for surveys to get your thoughts heard. These things thrive off of this type of input and the understanding that people are participating, so the importance goes both ways. The more feedback you give, the more visibility they have into your needs, and the better they can be served. Also – consider going to public meetings, such as county board or regional meetings to stay informed and provide comment. Local government is there to serve its citizens, and the best way to hear about local issues is directly.

Successfully implementing digital opportunity into practice does not need to be needlessly complicated. At the end of the day, as long as people come together with the same shared goal and the right intentions, much can be accomplished. The biggest hurdle is setting up the initial infrastructure that can enable these practices, which ultimately rely on local government and partners. Once personnel are in place and adequately trained, crucial data, research, and outreach methods are established, and potential funding, capacity, and resources are outlined, the next steps boil down to engagement - both with community partners who are already doing the work, and with residents who need to see that someone is looking out for them.

SECTION

07

CONCLUSION AND NEXT STEPS

7.1 Where Do We Go Now?

In just over five decades, the internet has evolved from an obscure academic tool to the central nervous system of the modern world – even the stage upon which much of modern life plays out. Its most important use cases of communication, education, commerce, health, and governance are no longer separate from the internet, but dependent on it. As we move deeper into the 21st century, the question is no longer whether people are online, but whether their connectivity is helping - or hurting - them. As we continue to innovate at the edges of AI, quantum computing, virtual and augmented reality, and widespread communications, the challenge is not just technological: it is deeply human. How do we use our voice to shape the policy so that the internet serves the common good in a complex, rapidly evolving world? How can we have our voice heard to those who control the infrastructure and web platforms, so that they continue to serve people? How do we move the needle on the rules for speech, commerce, and data? And how do we ensure that the benefits of this vast, transformative infrastructure are shared equitably, rather than concentrated to the already connected and the privileged?

As a rural county with aging infrastructure and limited density, Mathews is no stranger to the challenges of digital exclusion. Many residents, particularly older adults living on fixed incomes, veterans with service-connected disabilities, individuals experiencing poverty or housing instability, and those with disabilities, face persistent barriers to digital access. These covered populations, often spread across isolated or underserved parts of the county, are not only underserved but are increasingly disconnected from the tools that define modern participation in education, healthcare, employment, and civic life. These disparities are made worse by the lack of local digital support systems and a fragmented service landscape, where providers have little financial incentive to extend infrastructure into hard-to-reach areas without targeted investment or public-private partnerships.

In this environment, Mathews County's Official Digital Opportunity Plan is more than a roadmap for broadband deployment - it is a human-centered strategy to close opportunity gaps and create equitable systems of support. It recognizes that broadband is no longer a luxury, but a foundational utility for civic, social, and economic well-being. The plan envisions a future in which local infrastructure assets such as county-owned conduit, middle-mile networks, and public anchor institutions, are mobilized not only to expand access but to foster inclusion and opportunity. At its core, the plan calls on community leaders to embed digital opportunity into the fabric of public service delivery to ensure that Mathews' most vulnerable residents are not only connected but empowered to thrive in a digital world.

Hopefully, this plan can serve as a guiding light for county leadership to broaden its horizons on how to approach digital opportunity for not just covered populations, but every resident in Mathews. Expanding community engagement efforts through surveys, keeping up-to-date GIS datasets concerning disadvantaged demographics, and collaborating with community partners who are already boots-on-the-ground are the keys to not only expanding the types of programming available, but getting residents to be aware of these lifelines available to them. Ideally, this planning process will be revisited periodically, but the work will be constant; the county will drive these efforts, reexamine the current issues facing its constituents, and pursue funding through budget allocation or grant initiatives that will give life to the solutions that are identified through communication and engagement. That is the throughline to this entire endeavor - to build a coalition with trusted partners as the key to working through these issues. Dedicating some time monthly or even quarterly to discuss community problems, updated data and insights, and government/policy updates that affect these populations will keep community leaders and county officials engaged and solutions-oriented; opening up this forum to the public will let their voices continue to be heard throughout.

The current state of federal support for these practices is uncertain. BEAD non-deployment and the Digital Equity Act, which were once promising and necessary complements to broadband expansion, is no longer seen as a major piece of the puzzle.

Lawmakers are more likely to call out prejudice when it comes to technologies that are less capable and more specific in their uses (just because they are cheaper), than face the issues that people are living with daily and find solutions. It is up to us, the people that are involved in community, live shoulder-to-shoulder with our neighbors, and can hear and see their struggles first-hand, to advocate for these practices. Whether that consists of participating in discussions, having our voice heard in policy planning, or just showing up as a sign of support, we must take action to keep this work alive. The issues facing these communities will not go away - even if everyone has suitable broadband access, there will always be barriers to taking full advantage of technology. In these unprecedented times of advancement, where technology is changing the way we perceive information, interact with each other, and find our place in society, it is the burden of civic and community leaders to understand how these problems shift over time and continue to be vigilant in addressing solutions. This action, ultimately, will benefit everyone.

SECTION

08

APPENDICES AND GLOSSARY

8.1 APPENDIX A: Survey Results and Analysis

The survey that accompanies this planning document was hosted on Mathews County website here: broadband4mathews.info/digital-opportunity/

Based on 47 survey responses from residents of Mathews County, several critical themes emerged related to digital access, affordability, literacy, and infrastructure satisfaction. Internet access is relatively high, with 85% of respondents confirming home subscriptions. However, a significant minority (15%) remain unconnected, a concerning figure in a rural locality where alternative points of internet access are scarce. Among connected households, Breezeline dominates the provider landscape, though responses indicate substantial inconsistency in branding and naming, suggesting consumer confusion and weak brand coherence. Other providers like Verizon, T-Mobile, Starlink, and even HughesNet were mentioned, pointing to a fragmented and inconsistent service environment. Many respondents report using cable or 5G home internet services, but 8 out of 47 were unsure of their service type, highlighting a digital literacy gap in basic broadband comprehension. Only three individuals reported having fiber, and there were multiple mentions of Starlink, indicating an interest in or reliance on non-terrestrial options for improved speeds in remote areas.

Affordability and awareness of assistance programs present serious challenges. Only six respondents reported using the Affordable Connectivity Program (ACP), and just one utilized the Lifeline subsidy. These participation rates are alarmingly low, especially given the county's high proportion of income-limited households, seniors, and rural residents. The results underscore a stark gap in outreach and education around federal affordability programs. Despite relatively high access to devices (40 respondents reported adequate home device access), the low uptake of public internet resources - libraries, smart poles, or community Wi-Fi - suggests either a lack of awareness or deeper physical or psychological barriers to access. Over 75% said they never leave home solely to access the internet, though a small number expressed interest in doing so if more information were available.

Digital readiness gaps are further revealed in technology familiarity. Most respondents were only marginally aware of emerging technologies like AI, quantum computing, or VR/AR. For instance, 26 out of 47 had no idea what the Internet of Things (IoT) is, and 27 had never heard of quantum computing. While 20 respondents say they use AI tools regularly, this was more likely prompted by the prevalence of AI in mobile apps than deeper fluency. VPN and VoIP usage was higher than expected for a rural locality, though fewer than 10 said they used either regularly. These figures suggest a base level of awareness but little advanced usage, meaning tech education programming in the county should start with introductory courses and offer graduated instruction. Security and online trust are also notable concerns. A full 27 respondents (57%) expressed neutrality about their sense of online safety, and only one strongly agreed they felt secure. Four strongly disagreed. This widespread ambivalence suggests many users are uncertain how to protect themselves online, and further supports the need for digital literacy curricula focused on cybersecurity, privacy, and scams.

Qualitative comments from residents add deeper context. One respondent remarked on the lack of visible broadband deployment progress despite longstanding promises, calling out a "bare pole at Bohannon" as symbolic of stalled progress (even though it has been completed since). Another complained about Breezeline's unreliability, noting that high and inconsistent costs pushed them to explore dish-based options. Other responses were optimistic, thanking the County for its digital work and expressing hope for continued progress. Collectively, these insights suggest a population eager for digital advancement but underserved by current infrastructure, programs, and outreach. Moving forward, Mathews County should prioritize expanded resource and Lifeline outreach, local broadband competition, digital safety training, and user-friendly education about broadband service types to build digital equity and resilience across its communities.

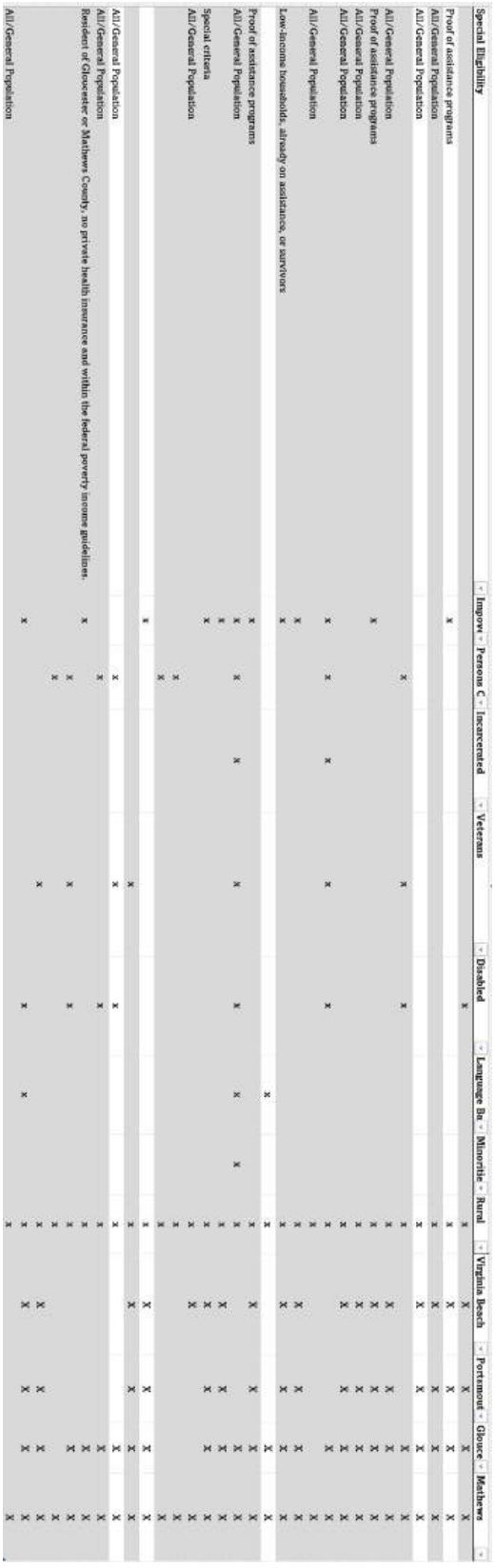
APPENDIX B: Master List of Resources by Covered Population

Program	Digital?	Organization Name	Organization Scale
Access Virginia C.A.R.T, Captioning, and Descriptions	Y	Access Virginia	Regional
Affordable Internet Package	Y	Verizon Forward	National
Arts for Learning Virtual Arts Services	Y	Arts for Learning	Regional
Community Health Initiative	N	Hampton Roads Community Action Program	Regional
Comprehensive Services to Seniors and Veterans	N	Bay Aging	Regional
FindHelp.Org Resource Locator	Y	FindHelp.Org	National
Free Device and Internet	Y	T-Mobile Project 10Million	National
General Resource Information for VA Residents	N	Virginia 2-1-1	Regional
Healthier757 Digital Health Literacy Programs with EdLogics	Y	Birdsong Health Literacy Center of Excellence	Regional
Job and Workforce Development Resources	Y	The Virginia Career Works - Saluda Center	Regional
Library Services and Digital Literacy Classes	Y	Mathews Memorial Library	Locality
Lifeline	Y	Universal Service Administrative Company	Regional
Line Extension Customer Assistance Program (LECAP)	Y	Department of Housing and Community Development	Regional
Literacy Volunteers of Gloucester, Inc	Y	National Literacy Directory	Locality
Low Cost Internet Package	Y	Access from AT&T	National
Middle Peninsula/Northern Neck Community Services Board (CSB)	N	Middle Peninsula Northern Neck Behavioral Health	Regional
Online resource for legal services and advice for Virginians	Y	VALegalAid.org	Regional
Payment Assistance Policy	Y	Starlink	National
Public Wi-Fi Access - Solar Poles	Y	Broadband Telecom Services	Regional
Senior Living and Care	N	Riverside Lifelong Health & Rehabilitation Mathews	Locality
Senior Support Services	N	People Aging in Their Homes (PATH)	Locality
SNAP-Ed	N	Association of SNAP Nutrition Education Administrators	National
Telehealth and Device Program for Veterans	Y	VA Telehealth Services	Regional
Telehealth Technical Assitance	Y	Mid-Atlantic Telehealth Resource Council	Regional
Telemedicine and Internet Access	Y	Walter Reed Nursing and Rehabilitation Center	Regional
Telemedicine Option	Y	Gloucester Mathews Care Clinic	Regional
Telemedicine Services	Y	Riverside Care Facilities	Regional
TRIAD Program	Y	Mathews County	Locality
Veteran Community Events - Physical and Digital	Y	VA Tech for Troops	Regional
VITA - Tax preparation and financial literacy	Y	LIFE Financial Assistance Organization, Inc.	Regional
Wi-Fi to Go!	Y	Mathews Memorial Library	Locality

Description
Provides open captioning and audio description at live theatrical performances so that Deaf/Hard of Hearing and Blind/Visually Impaired persons
Low-cost package
Provides a substantial range of educationally linked, hands-on and interactive arts experiences, with a learning program that can be delivered digitally to instructors, for a fee
The program addresses a broad range of health issues while providing ongoing community resources.
Provides transportation, housing, and medical services to aging seniors and veterans.
Allows people to filter available services by their specific demographic and needs to find suitable resources, ranging form unemployment assistance, to auditory care and much more
Free internet and devices for students
Provides a list of available services to Virginia residents
Provides a free resource for many digital health focused trainings
Provides a range of free employment, training, and career development services to job seekers and employers in the region
Offers public computers, 'Digital Branch', which provides e-resources, e-book, and audio book rentals, and digital literacy classes
Eligible consumers - survivors - can get up to $9.25 off the cost of phone, internet, or bundled services. Can also provide a free phone to those who qualify.
State subsidy for long drop line extension assistance for households with high special construction provider estimates
In-person and online literacy instruction, as well as technology and math skill assistance. Tutors ESOL learners.
Low-cost package with free Wi-Fi
General resources, as well as ADA compliance assistance, language assistance, life skills consulting, crisis services, housing assistance, and much more.
Provides complete, accurate, up-to-date information on poverty law issues in an interactive and easily accessible format. The intent is to allow access to this information by legal aid attorneys, probono attorneys, clients, advocates and providers of services to legal aid's traditional client base.
Application to qualify for reduces internet pricing
6 deployed in CVB, 8 in Mathews
Rehabilitation, nursing care, and therapy-based services to seniors.
Provides assitance to senrios who need transportaion, access to services, caregiving, meals, and handywork.
Strives to advance successful practices that lead to incorporating the Dietary Guidelines for Americans, specifically among SNAP-eligible individuals and communities.
Brings high-quality care to Veterans wherever they are, with device loans and affordability programs, as well as tech support.
Develops resources to support the growth of telehealth, with a particular focus on providers serving rural and communities where access to quality healthcare is limited
A facility that focuses on memory care and offers amenities.
Remote appointments
Using sophisticated teleconferencing technology and specialized digital medical devices, telemedicine enhances patient care. Also offers at-home assistance through MyChart.
A cooperative effort of law enforcement agencies (police/fire/sheriffs), senior citizens, and senior organizations, focused on reducing crimes against seniors, including scams and fraud.
Empowers the under-resourced Veterans and their families by providing sustainable lifelong digital skills backed through training, education, and technology.
Offers free tax preparation for families and individuals with $65,000 or less income with an option for virtual appointments
Device rental program from library

Special Eligibility	Impoverished (150% FPL)	Persons Over 60	Incarcerated	Veterans	Disabled	Language Barrier	Minorities
Proof of assitance programs	x						
					x		
All/General Population							
All/General Population							
	x						
All/General Population							
All/General Population							
All/General Population							
				x			
All/General Population							
All/General Population							
All/General Population							
All/General Population							
				x			
Proof of assitance programs	x						
Proof of assitance programs	x						
Low-income households, already on assistance, or survivors	x						
All/General Population							
All/General Population							
			x				
	x			x	x		
All/General Population							
/				x			
Homeless, ex-offenders			x				
Have children or on TANF and need transportation assistance	x						
All/General Population							
All/General Population							
People with Health-based Concerns		x			x		
					x		
	x						
	x					x	
	x				x	x	
All/General Population	x			x			
	x						x
							x
	x		x		x		
		x					
All/General Population							
All/General Population							
All/General Population							
All/General Population							
All/General Population							
Multiple Special Circumstances	x						
					x		
Proof of assitance programs	x						
	x						
				x			
				x			
	x						
Proof of assitance programs	x						
	x				x		x
	x	x					x
All/General Population							
	x	x		x	x	x	x

Affordability	Access	Adoption	Advanc	Asset Ty	Quantity	Web Link
	X	X		Program	NA	https://www.accessvirginia.info/services
X				Program	NA	https://www.verizon.com/discounts/verizon-forward/
		X		Program	NA	https://arts4learningva.org/services/
				Program	NA	https://hrcapinc.org/directory/listing/community-health-initiative/
				Program	NA	https://bayaging.org/
	X	X		Program	NA	https://www.findhelp.org/money/financial-assistance--norfolk-va
X	X			Program	NA	https://www.t-mobile.com/brand/project-10-million
X				Program	NA	https://211virginia.org/
		X		Program	NA	https://www.rewardsforhealthyliving.com/
			X	Program	NA	The Virginia Career Works - Saluda Center
	X	X		Device/Prog	NA	https://www.mathewslibrary.org/
X				Program	NA	https://www.lifelinesupport.org/
	X			Program	NA	https://www.dhcd.virginia.gov/lecap
		X		Program	NA	https://www.nld.org/literacy-volunteers-of-gloucester-inc?student=1
X	X			Program	NA	https://www.att.com/internet/access/
				Program	NA	https://www.mpnnbh.org/101/Services-Programs
		X		Program	NA	https://www.valegalaid.org/
X				Program	NA	https://www.starlink.com/legal/documents/DOC-1539-43126-70
			X	Device	14	NA
				Program	NA	https://www.riversideonline.com/lifelong-health-and-aging/lifelong-health-and-aging/our-communities/skilled-nursing/riverside-lifelong-health-and-rehabilitation-mathews
				Program	NA	https://mathewspath.org/
				Program	NA	https://asnna.us.org/
X	X	X		Program	NA	https://telehealth.va.gov/digital-divide
	X	X		Program	NA	https://matrc.org/about-matrc/our-services/
	X			Device/Prog	NA	https://vahs.com/walterreed/
	X			Program	NA	https://www.gmcareclinic.com/covid19
				Program	NA	https://www.riversideonline.com/medical-services/telehealth
		X		Program	NA	https://www.mathewscountyva.gov/235/Triad-Program
		X		Program	NA	https://techfortroops.org/
		X		Program	NA	https://www.lifefinancialorganization.org/workshops
X	X			Device	50	https://mathewslibrary.org/library-services/wifi-to-go



Special Eligibility	Improvi	Persons C	Incarcerated	Veterans	Disabled	Language Ba	Minorities	Rural	Virginia Beach	Portsmouth	Gloucester	Mathews
Proof of assistance programs					x			x	x	x	x	x
All/General Population												
All/General Population	x							x	x	x	x	x
All/General Population												
All/General Population		x		x	x			x	x	x	x	x
Proof of assistance programs	x											
All/General Population								x	x	x	x	x
All/General Population			x		x			x	x	x	x	x
All/General Population	x	x		x	x			x	x	x	x	x
Low-income households, already on assistance, or survivors	x					x		x	x	x	x	x
Proof of assistance programs	x							x	x	x	x	x
All/General Population	x		x	x	x	x	x	x	x	x	x	x
Special criteria	x							x	x	x	x	x
All/General Population		x						x	x	x	x	x
								x				x
		x						x	x	x	x	x
All/General Population				x	x			x	x	x	x	x
All/General Population		x			x			x	x	x	x	x
Resident of Gloucester or Mathews County, no private health insurance and within the federal poverty income guidelines.	x			x	x			x		x	x	x
All/General Population		x						x	x	x	x	x
								x				x
								x	x	x	x	x
All/General Population	x				x			x	x	x	x	x

For the complete asset list (including non-digital resources for covered populations) and resource links, please see the Digital Opportunity Viewer and request the most current Asset Inventory Master List from the deliverables package or Broadband Telecom directly.

8.3 APPENDIX C: Glossary

ARPANET
The Advanced Research Projects Agency Network—launched in 1969 by the U.S. Department of Defense—as the first wide-area packet-switched network and a direct precursor to the modern internet (techtarget.com).

Artificial Intelligence (AI)
Computer systems or software that simulate human cognitive functions such as learning, reasoning, and self-correction, commonly used in tools for automation, prediction, or personalization.

Assisted Technologies
Software or hardware tools (e.g., screen readers, voice control, eye-tracking interfaces) designed to help individuals with disabilities interact with digital devices and online content.

BEAD Program (Broadband Equity, Access, and Deployment)
A $42.45 billion initiative under the Infrastructure Investment and Jobs Act (IIJA) to fund high-speed internet infrastructure and digital inclusion programs across all U.S. states and territories (broadbandusa.ntia.gov).

Blockchain
A decentralized, cryptographically secure digital ledger system used to record transactions across many computers. It is most commonly associated with cryptocurrencies and secure supply chains.

Broadband
High-speed internet access that is always on and faster than traditional dial-up access. Technologies include fiber, cable, DSL, satellite, and fixed wireless.

Cloud Computing
The on-demand delivery of IT services—such as servers, storage, databases, networking, software—over the internet, allowing for flexible, scalable use.

Community Anchor Institution (CAI)
Organizations like schools, libraries, healthcare centers, and public safety facilities that provide crucial services and require robust broadband connectivity to serve communities effectively.

Covered Populations (Digital Equity Act)
Groups identified by the NTIA as experiencing barriers to digital inclusion:

- Low-income households
- Aging individuals
- Incarcerated and formerly incarcerated people
- Veterans
- People with disabilities
- Individuals with language barriers (LEP)
- Racial and ethnic minorities

- Rural inhabitants
  These groups were selected due to persistent structural inequalities and systemic barriers to broadband access, affordability, and use.

Cybersecurity
The practice of protecting systems, networks, and programs from digital attacks, data breaches, and unauthorized access.

Deepfake
Synthetic media generated using AI that can replicate a person's likeness in video, audio, or images, often for deceptive or misleading purposes.

Digital Adoption
The effective use of digital tools and platforms in everyday life, including digital literacy, affordability, and trust in technology.

Digital Divide
The gap between individuals who have access to modern information and communication technology (ICT) and those who do not, often due to economic, geographic, or demographic factors.

Digital Equity
The condition in which all individuals and communities have the information technology capacity needed for full participation in society, democracy, and the economy.

Digital Equity Act (DEA)
Authorized under the IIJA, the DEA allocates $2.75 billion to promote equitable access to broadband through planning, implementation, and capacity-building grants at the state and local levels.

Digital Inclusion
Strategies and programs that ensure individuals and communities have access to affordable internet service, devices, digital skills training, technical support, and opportunities for full participation.

Digital Literacy
The skills necessary to effectively and critically navigate, evaluate, and create information using a range of digital technologies.

Digital Navigator
A trained individual who provides one-on-one or group support to help people access devices, sign up for affordable internet, and build digital skills. Digital Navigators are often based in libraries, nonprofits, or local governments.

Digital Opportunity
The broader concept that recognizes internet access alone is insufficient; individuals also need devices, affordability, digital skills, and local support to benefit from connectivity.

Device Access
The ability to obtain and maintain an internet-capable device, such as a laptop, tablet, or smartphone, often a key barrier to digital equity.

Fixed Wireless
A type of internet service that uses radio signals (not cables) to connect stationary points—typically a subscriber module on a home and an access point on a tower.

FTTP (Fiber-to-the-Premises)
A broadband architecture where fiber-optic cables extend directly from a provider's network into homes or businesses, offering ultra-high speeds and reliability.

Infrastructure Investment and Jobs Act (IIJA)
A 2021 federal infrastructure law that invests $1.2 trillion in transportation, energy, water, and broadband infrastructure—including BEAD and Digital Equity programs.

Internet of Things (IoT)
A network of connected devices embedded with sensors and software that exchange data—such as smart thermostats, wearables, and medical monitors.

Latency
The time it takes for data to travel from the source to its destination, measured in milliseconds. Lower latency results in faster, more responsive internet performance.

Lifeline Program
A federal subsidy that offers a monthly discount on phone or internet service to low-income households, administered by the FCC's Universal Service Fund.

Low-Earth Orbit (LEO) Satellite
An emerging satellite broadband technology (e.g., Starlink) using constellations of satellites in low orbits to provide lower-latency, higher-speed connectivity compared to traditional geostationary satellites.

Mobile Wireless (Cellular Broadband)
Wireless internet access via mobile networks such as 4G LTE or 5G. Used through smartphones, hotspots, or as fixed wireless solutions, especially in underserved areas.

Mosaic
The first widely adopted graphical web browser, launched in 1993. It helped popularize the World Wide Web by offering a user-friendly interface for navigating websites.

NSFNET (National Science Foundation Network)
An early high-speed backbone network in the U.S. that replaced ARPANET and helped commercialize the internet in the 1980s and 1990s.

Packet Switching
A method of breaking data into smaller packets and sending them individually over a network. Each packet may take a different route and is reassembled at the destination. This is the foundational technology of the internet (naco.org, congress.gov).

Public-Private Partnership (P3)
A collaborative agreement between a government agency and a private-sector company to deliver a service or infrastructure project, such as broadband networks.

Scalability
The ability of a technology, system, or infrastructure to expand its capacity to accommodate growing demand.

STEM
An acronym for Science, Technology, Engineering, and Mathematics—fields often targeted in workforce development and education initiatives.

Subsidized Internet Program
Any initiative that reduces the cost of internet service through public funding—examples include the Affordable Connectivity Program (ACP), Lifeline, and locally funded broadband vouchers.

Telehealth
The use of telecommunications technologies to provide healthcare services and consultations remotely.

TCP/IP (Transmission Control Protocol / Internet Protocol)
The foundational set of communication protocols used to interconnect network devices on the internet.

Universal Service Fund (USF)
A system of telecommunications subsidies managed by the FCC to promote access to services in rural areas, low-income households, schools, libraries, and healthcare providers.

Virtual Private Network (VPN)
A service that encrypts internet traffic and masks the user's IP address, often used to secure communications or access restricted resources.