THE SYCAMORE INSTITUTE

Digital Literacy Among Tennessee's Older Adults

July 30, 2024

Key Takeaways

- Digital literacy—an individual's capacity to learn and safely use technology—is important to the growing older adult population and for an aging workforce.

- Older adults face specific challenges in using new digital tools such as lower adoption and use, income- and geographic-related barriers, and vulnerability to fraud and misinformation.

- Ongoing state and federal initiatives, including significant federal investment and Tennessee's new long-term Digital Opportunity Plan, are working to address these challenges.

- Policymakers may want to focus on effective implementation of ongoing efforts, sustainable funding, and understanding an ever-evolving technology landscape.

Older adults face specific challenges in accessing, learning, and using technologies that could enhance their quality of life. When Tennesseans of all ages can access and proficiently navigate the digital realm, it benefits their well-being and the state's prosperity. This report examines recent trends and barriers to digital literacy among older adults and key initiatives and considerations to narrow the digital divide.

What is Digital Literacy?

Digital literacy is an individual's capacity to learn and safely use digital technologies—an increasingly important skill with today's rapid technological advancements. Digitally literate individuals can safely access digital tools, understand their purposes, and use them to improve their quality of life. They know where to look and who to contact to understand a new digital tool or process. (1) (2) (3) (4) Digital literacy is also a lifelong process necessitated by the continual introduction of new technologies.

Older Adults and Digital Literacy

Digital literacy can offer value to older adults. For example, digital skills equip individuals to shop online, pay bills, communicate with loved ones, and apply for nutrition assistance, TennCare, rental assistance, and other public benefit programs. (5) (6) These advantages and the growing size of Tennessee's 65+ population (**Figure 1**) highlight the need to understand older adults' digital behavior and the barriers they encounter. (7)

Building technology skills is especially important for older adults navigating the health care system. Digital skills are needed to access medical records, make appointments, manage healthcare apps, and use new therapeutic devices, such as FDA-approved apps, for treating and managing conditions like insomnia, depression, substance abuse, and diabetes, among others. (8) (9) New technologies can help address social isolation, and innovations like telehealth can increase access to health care—particularly in rural areas. (5) (10) (11) (12) (13) (14) (15) For these reasons, public health experts increasingly recognize digital literacy and broadband access as key drivers of health outcomes for older adults. (8) (16) (17) (18)

Digital literacy is also important for an aging workforce. In the context of longer life spans and sometimes inadequate retirement savings, a growing share of individuals are working beyond age 65. Older adults ages 65+ now comprise a larger portion of the labor force than in recent decades—a trend expected to continue. (19) (20) (21) (22) Access to digital tools and continuing education is important for enhancing the job and financial security of older adults who are and will remain in the workforce. (23) (24)

Figure 1. The Share of Older Adults in Tennessee is Expected to Grow from 18% in 2022 to 20% by 2030

Population Totals and Percent Share by Age Group (2022 vs. 2030)
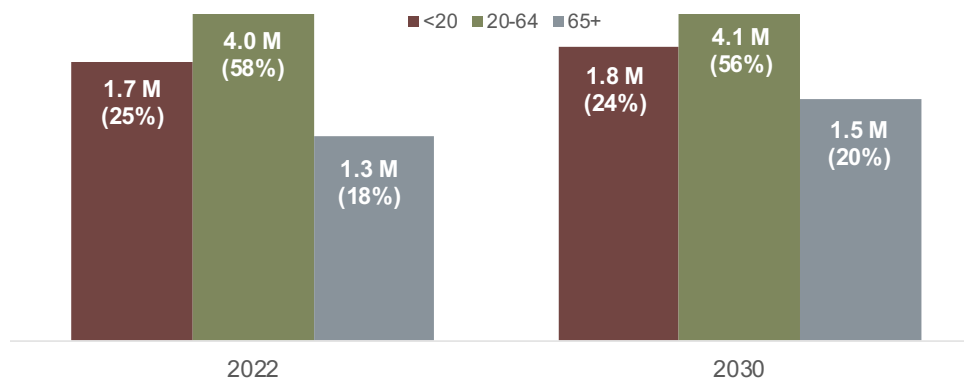
Note: Totals may not add up to 100% due to rounding.
Source: Estimates from Boyd Center for Business and Economic Research (25)

Challenges for Older Adults

Older adults want to use technology but face unique challenges in safely accessing and learning new digital tools. For example, older Tennesseans who recently participated in digital literacy programs were most interested in building skills to access health services and information, contacting friends and family, finding news and entertainment, and engaging in education activities. (26) (27) (28) The

participants' experiences and other research highlight several key challenges for older adults, such as: (26) (29)

- Lower adoption and use of digital tools.
- Limited access to essential technologies.
- Susceptibility to fraud and misinformation.
- Income- and geographic-related barriers.

The rest of this section explores age-related differences in technology access, adoption, and use. It also examines the income and geographic barriers contributing to these disparities and issues related to online fraud and misinformation.

Technology Adoption and Usage

Older adults use digital tools less than younger generations. (30) Older adults are less likely to use the internet, laptops, and smart devices (**Figures 2** and **3**). (31) In 2022, only 82% of Tennesseans age 65+ had both a computer and a broadband internet subscription compared to 93% of those ages 18 to 64 (**Figure 4**). (32) Older adults also tend to engage in other online activities less often—including email, texting, social networking, streaming, online shopping, and scheduling services (**Figure 3**). (31) (33)

Figure 2. Older Adults Are Less Likely to Use the Internet—Although Gaps Have Narrowed
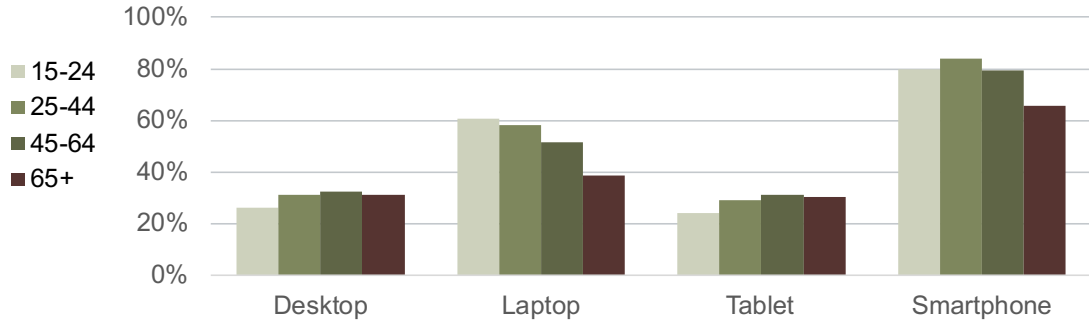
Internet Use by Age Group in the U.S. (1998-2021)
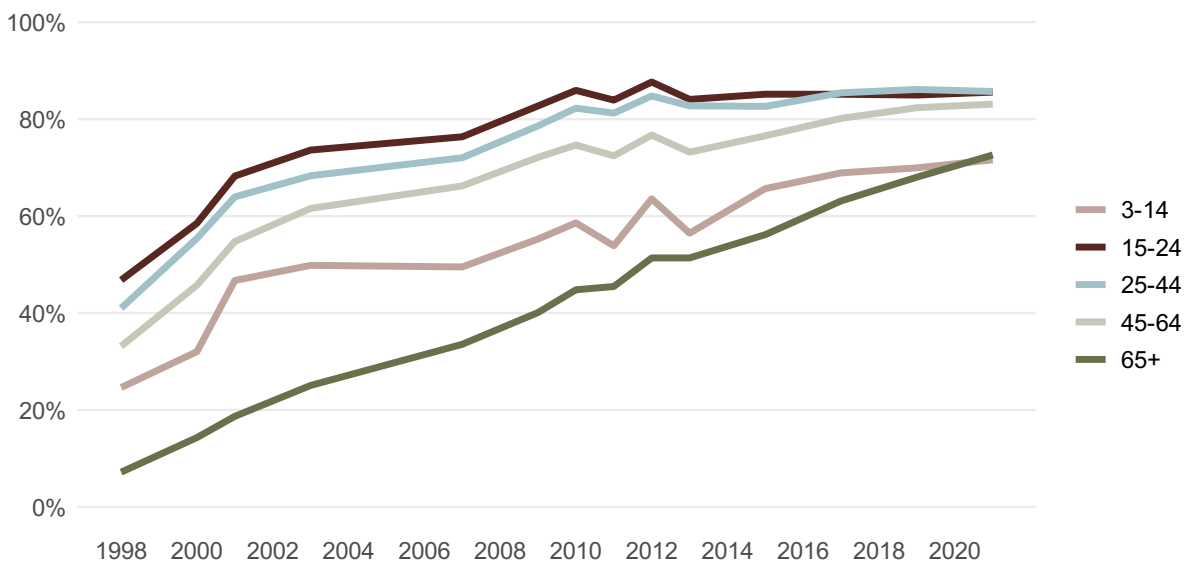
Source: U.S. Department of Commerce, National Telecommunications and Information Administration (31)

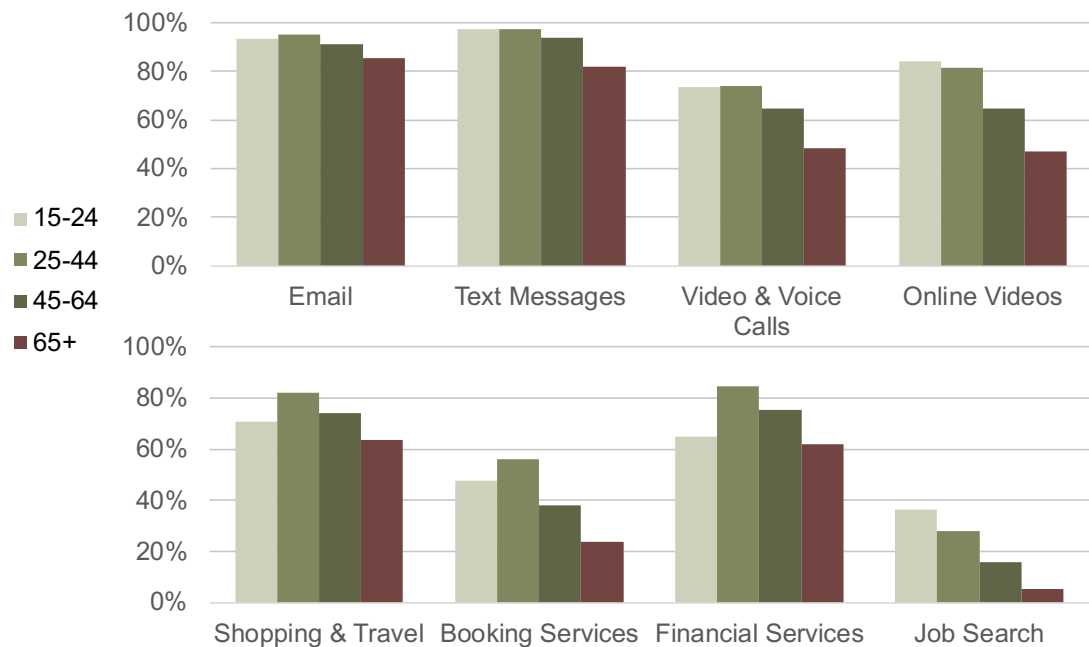## Figure 3. Older Adults Use Digital Technology Less Often Than Younger Generations

% of U.S. Adults Who Say They Use Each of the Following by Age Group (2021)
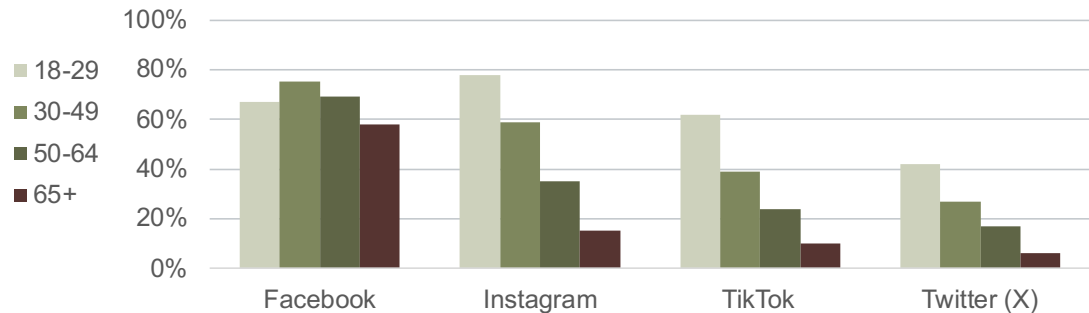
Devices

Activities

Social Media

Source: Device and Activities data from the U.S. Department of Commerce, National Telecommunications and Information Administration (31) Social Media data from the Pew Research Center (33)

Figure 4. Older Tennesseans Are Less Likely to Have Access to a Computer and Internet Than Younger Generations

% of Tennesseans with a Computer and Internet Subscription in the Household by Age (2022)
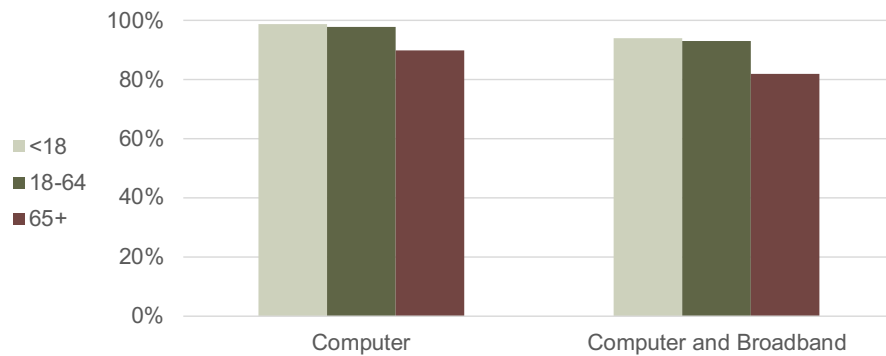

Source: U.S. Census Bureau, American Community Survey (32)

Even among older adults, there are generational gaps in technology use. As a group, Baby Boomers (i.e., born 1946-1964 and ages 56-78 in 2024) adopt and use new technologies at a much higher rate than those belonging to the Silent Generation (i.e., born 1928-1945 and ages 79-96 in 2024). Baby Boomers are also much more likely to own a smartphone or tablet and use social media (**Figure 5**). (34)

The emergence of new technologies could widen these gaps. For example, artificial intelligence (AI) tools are now more prevalent in personal and professional settings. (35) However, available data show gaps in adoption—with individuals soon to enter older adulthood lagging younger cohorts (**Figure 6**). (36)

Figure 5. Baby Boomers Lead the Silent Generation on Digital Technology Adoption
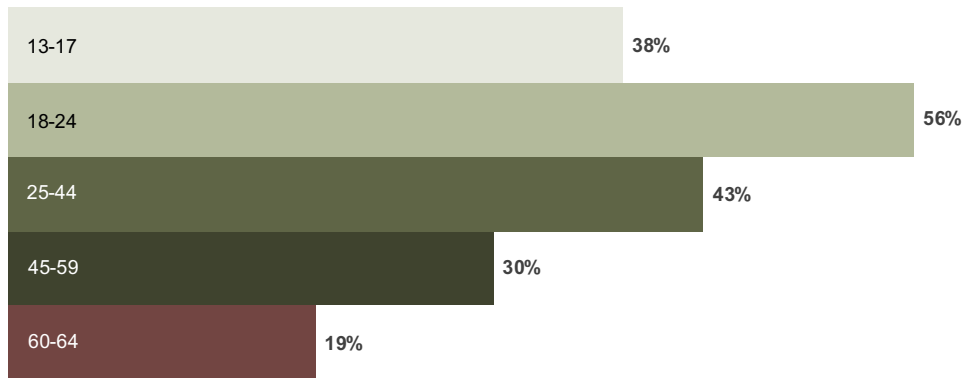
% of U.S. Adults Who Say They Use or Own Each of the Following by Generation (2019)
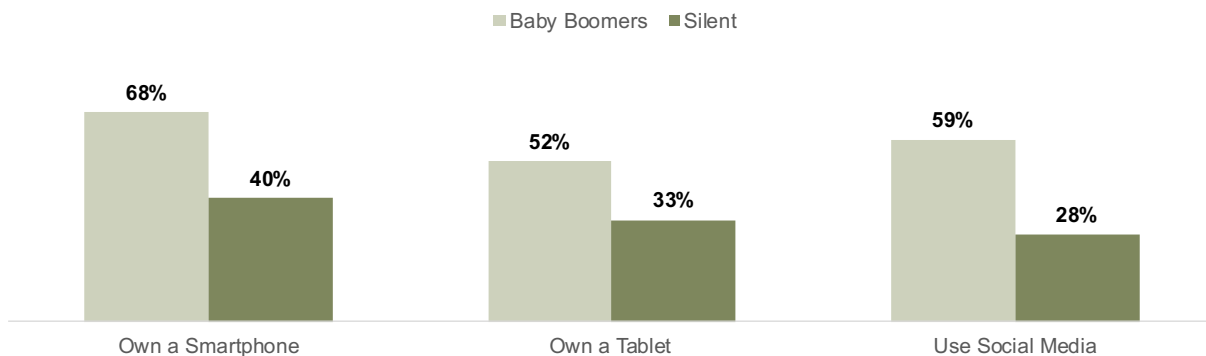
Source: Pew Research Center (34)

Figure 6. Among Adults, Older Individuals Trail Younger Groups in AI Usage

% Global Users of Generative AI by Age Group (2024)

Age Group	Percentage
13-17	38%
18-24	56%
25-44	43%
45-59	30%
60-64	19%

Source: Microsoft (36)

Financial Costs

Lower income individuals may have a harder time affording digital devices, and adults 65+ tend to live on lower, more fixed incomes than other Tennesseans. For low-income individuals, the cost of technologies like high-speed internet and computers may be a financial burden. Data show that lower-income Tennesseans are less likely to have broadband internet (**Figure 8**), and nationally, lower-income households also have lower levels of technology adoption (**Figure 9**). (37) (38) Meanwhile, the median household income for Tennesseans 65+ was about 26% lower than the overall median in 2022 (**Figure 7**. These incomes are often lower in rural areas (discussed later). (39) National data also show that over 40% of those ages 55-64 had no retirement savings in 2022. (40) These factors may contribute to lower overall digital technology adoption rates among older adults.

Figure 7. Median Income by Age in Tennessee

Median Household Income in the Past 12 Months by Householder Age (2022)

Age Group	Median Income
<25	$42k
25-44	$72k
45-64	$80k
65+	$48k
TN	$65k
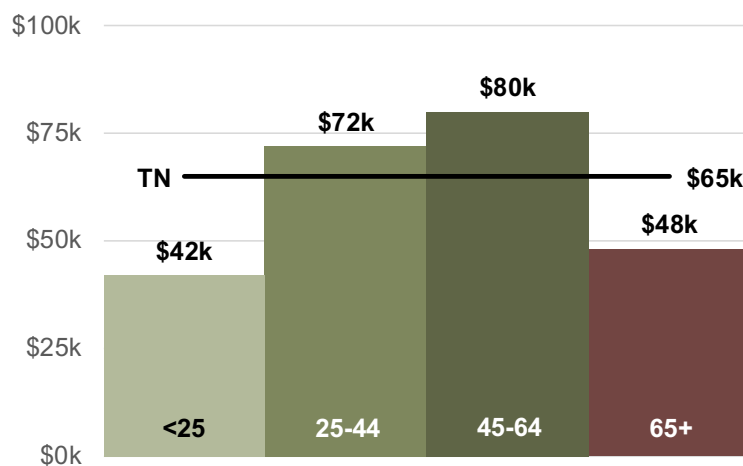
Source: U.S. Census Bureau, 2022 American Community Survey 1-Year Estimates (39)

Figure 8. Lower Income Households Are Less Likely to Have Broadband Internet Than Higher Income Ones in Tennessee

% of Tennessee Households with Broadband Subscriptions by Income (2022)
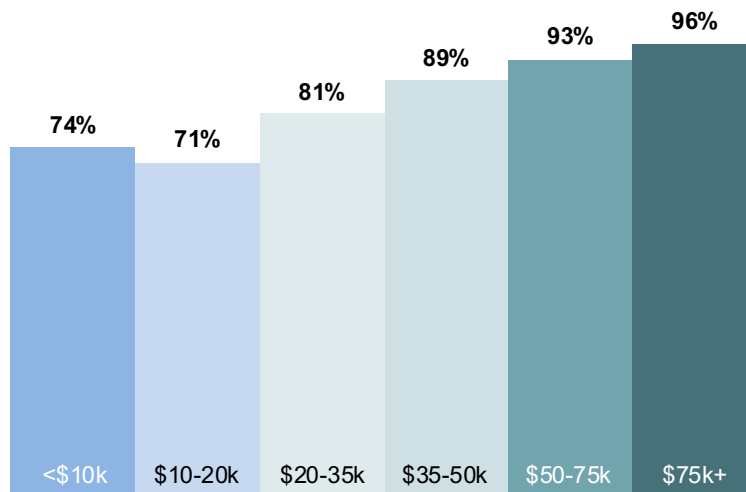
Broadband subscription is defined as non-dial up internet subscriptions.
Source: U.S. Census Bureau (38)

Figure 9. Nationally, Lower Income Households Have Lower Technology Adoption

% of U.S. Adults Who Say They Have Each of the Following by Household Income (2021)
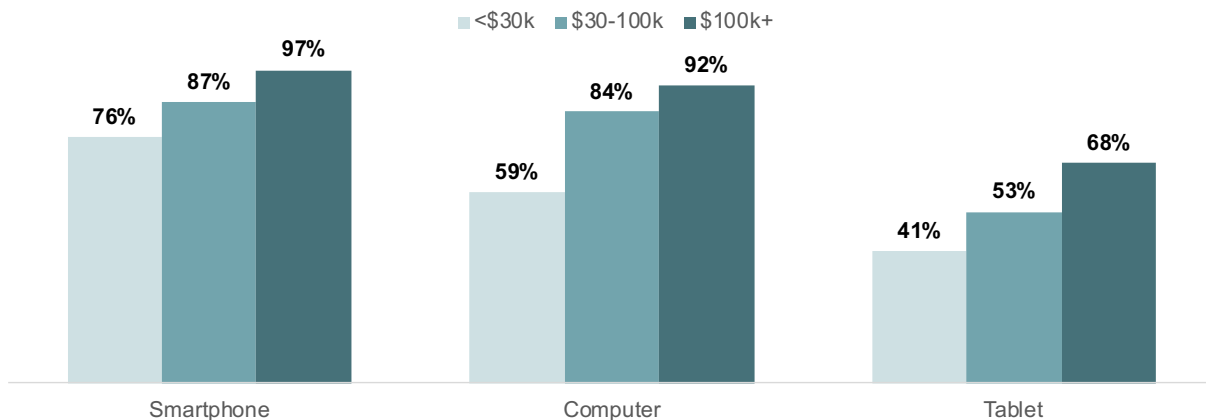
Source: Graphic reproduced from the Pew Research Center (37)

Rural Challenges

Rural areas have historically had less internet access and higher subscription prices. (41) (42) Because fiber optic cables are expensive to build, internet providers tend to invest in population-dense urban and suburban areas with more potential paying customers. (43) (28) Meanwhile, pricing in urban areas tends to be lower because there is more competition for customers. (42)

Access to high-speed broadband is more uneven in rural areas than in urban ones. Internet must meet federal speed requirements to qualify as "high-speed broadband." The current standard is 100/20 megabits per second (Mbps) (i.e., download speeds of at least 100 Mbps and upload speeds of at least

20 Mbps). (44) Most fixed broadband in the U.S. exceeds 250/30 Mbps, accommodating many high-demand users, devices, and activities. (45) (46) (47) According to federal data, 100/20 Mbps speeds are available in all Tennessee counties but not necessarily universally available to all residents within those counties (**Figure 10**), and high-end 1,000/100 Mbps speeds are only available in some rural counties (**Figure 11**). Overall, Tennessee has more broadband access than the country as a whole. (48)

Figure 10. Access to High-Speed Broadband Is Less Common in Rural Areas of Tennessee

% of Residential Units Covered by 100/20 Mbps Cable and Fiber Internet Service (2023)
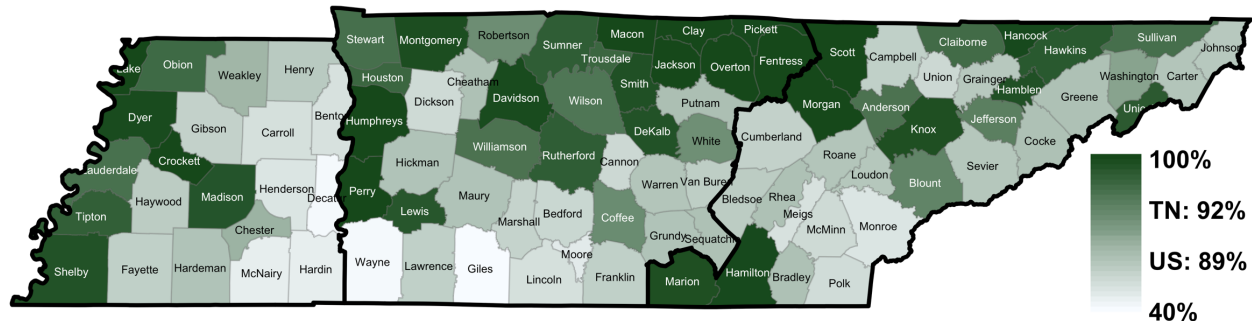
Note: Under FCC rules, internet must reach 100/20 Mbps speeds to qualify as high-speed broadband.
Source: U.S. Federal Communications Commission (48)

Figure 11. 60% of Tennessee Households Have Access to High-End, High-Speed Broadband

% of Residential Units Covered by 1000/100 Mbps Cable and Fiber Internet Service (2023)
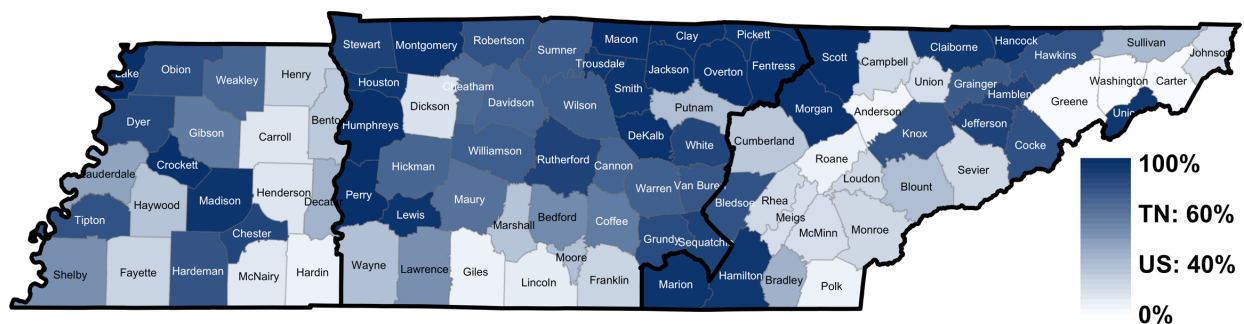
Source: U.S. Federal Communications Commission (48)

Age- and income-related barriers may be particularly acute in Tennessee's large rural areas, which tend to have higher concentrations of older adults and lower incomes. In 2022, adults ages 65+ made up almost 20% of residents in Tennessee's rural counties—compared to just over 15% of urban county residents (**Figure 12**). (49) (50) Meanwhile, older adults in rural counties tend to have lower incomes than their counterparts statewide. In 62 of Tennessee's 72 rural counties, the median household income of residents ages 65+ was below the group's statewide median of $48,198. (**Figure 13**). (49) (51)

Figure 12. Older Adults Make Up a Larger Share of the Population in Tennessee's Rural Counties Than Urban Ones

% of County Population Ages 65+ (2018-2022)
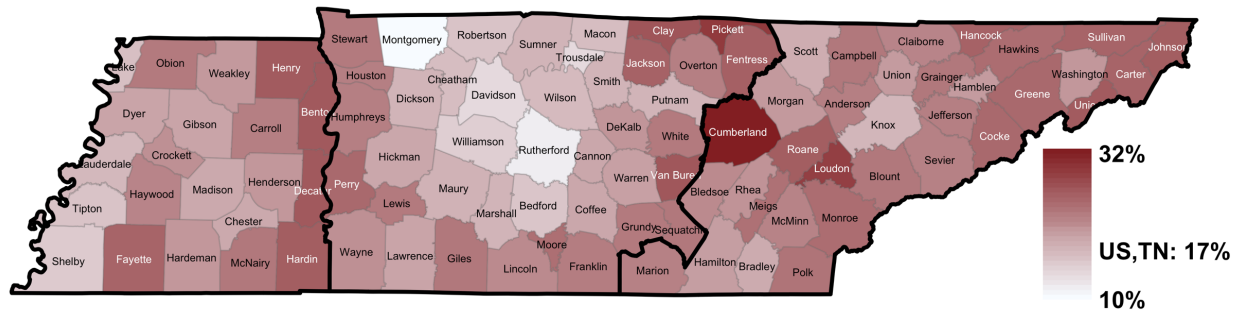
Source: U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates (50)

Figure 13. Tennessee's Older Adults Tend to Have Lower Incomes In Rural Areas

Median Household Income Among Householders Ages 65+ (2018-2022)
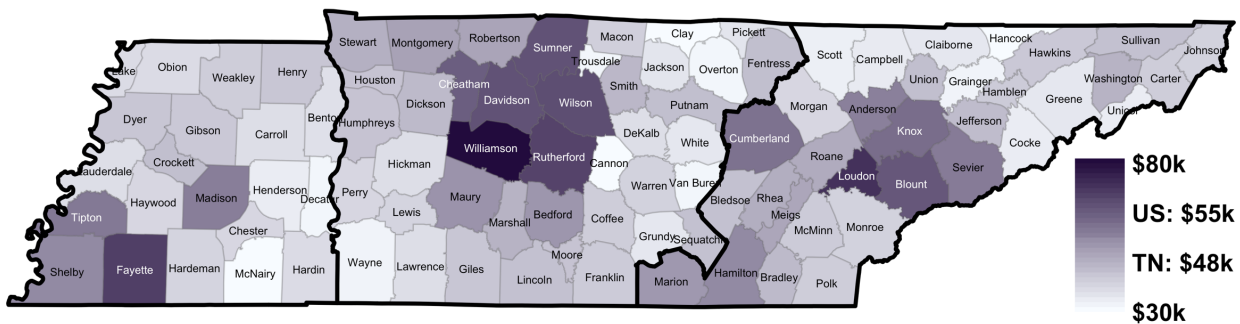
Source: U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates (51)

Digital Fraud and Misinformation

Older adults may be acutely vulnerable to digital fraud and misinformation. Internet-related financial fraud targeting older adults is a growing concern that is both underreported and understudied. (52) (53) (54) In 2023, Tennesseans ages 60+ made 1,577 complaints about digital fraud to the Federal Bureau of Investigation. These complaints amounted to nearly $44 million in losses or an average of $28,000 per complaint. (53) These losses can be particularly harmful because victims—who are near retirement or no longer working—have less time and ability to recover the money they accumulated during their prime working years. (55) Lower digital literacy rates among older adults are also associated with an increased vulnerability to accepting and sharing misinformation online. However, brief digital literacy programs have improved the capacity to discern false information. (56) (57)

Efforts to Address Older Adults' Digital Literacy in Tennessee

Ongoing state and federal initiatives are working to address income- and geographic-related barriers and help older adults appropriately use digital tools. These efforts are part of a broader strategy to assist groups that traditionally face technology challenges, including: (58) (59)

- Low-income households
- Older adults
- Veterans
- Individuals with disabilities

- English language learners
- Racial and ethnic minorities
- Rural residents
- Incarcerated individuals

Recent federal legislation has played a major role in improving rural internet access, increasing accessibility for low-income individuals, and expanding digital skills training. (60) (61) (62) For example, the bipartisan 2021 Infrastructure Investment and Jobs Act (IIJA) created the Broadband Equity, Access, and Deployment (BEAD) program. In June 2023, the program dispersed $813 million to extend high-speed internet infrastructure to over 186,000 Tennessee households and businesses lacking access. (63) IIJA's Affordable Connectivity Program—which expired this April—allocated $254 million to provide monthly internet subsidies to nearly 430,000 low-income households in Tennessee over the last two years. (64) (65) The 2021 American Rescue Plan Act (ARPA) also provided nearly $30 million in funding for local organizations through Tennessee's Digital Skills, Education, and Workforce Development Program. (59) (66) (67) (68) (69)

Tennessee also uses long-term strategic planning to integrate federal initiatives with ongoing state efforts. (70) (59) In March, the federal government approved Tennessee's Digital Opportunity Plan (TNDOP), unlocking up to $15.8 million to enhance digital literacy programs and tackle persistent issues related to internet and technology access. (71) (72) The plan outlines targeted goals, strategies, and measures for improving digital access and literacy. Those strategies include:

- Increase the number of free Wi-Fi and computer telehealth "access point" sites.
- Extend high-speed internet (100/20 Mbps+) to underserved households.
- Expand digital skills and workforce development programs through grants.
- Develop cybersecurity and digital safety information for the public.
- Establish no-cost, low-cost, and refurbished device programs.
- Improve state agency websites' accessibility and develop navigation training modules.

The use of state grant funding is part of a broader effort by local governments and community organizations in Tennessee to increase digital access and literacy. For example, the state recently announced $6 million in grants for 64 county governments to do things like build free public Wi-Fi locations, distribute low-cost or refurbished devices, and offer digital literacy programs. (67) (59) As of March 2024, over 180 Tennessee libraries, businesses, and nonprofits worked directly or in conjunction with local governments to support these activities. (59) Local digital literacy programs cover a wide range of topics from basic computer skills to navigating health, e-commerce, and small business resources, including: (29) (73) (74)

- Computer basics training (e.g., device usage, email, internet browsing, and video calls)

- Digital safety (e.g., passwords, phishing, https identification, Better Business Bureau verification)
- E-commerce (e.g., digital wallets, grocery pick-up, telehealth)
- Entertainment (e.g., social media, games, video, and music)

Another example is a 2022-2023 grant program, Reducing Social Isolation and Increasing Access to Essential Services Through Digital Literacy and Inclusion for Older Tennesseans. The program distributed $3.8 million in state funds to support strategies for increasing digital literacy among those ages 60+.[1] The West End Home Foundation, an independent foundation located in Nashville, administered the grant and distributed funds to 30 local organizations across the state. Programs covered the basic activities listed above, gave participants laptops and tablets, and helped older adults access state assistance and healthcare apps. (26) (27) (28) Key findings from these initiatives included: (26)

- Older adults were eager for digital literacy training and reported benefits from participation.
- Participants reported increased technology use, social connection, and career development skills.
- The use of established community organizations attracted wide participation.
- Transportation and accessible locations boosted attendance.
- Accommodations for a wide range of physical abilities improved teaching and learning.
- A reliance on volunteer instructors sometimes limited capacity.
- Limited internet access and high device costs were ongoing barriers for the broader population.

Finally, these recent initiatives build on the state's related pre-pandemic efforts. For example, Tennessee's 2017 Broadband Accessibility Act allocated $60 million for broadband deployment grants, deregulated the broadband service industry to allow nonprofit electric cooperatives to provide internet service, and disbursed over $200,000 in grant funds to 45 local libraries for digital literacy programming. (75) (76)

What's Next?

The success of ongoing efforts will ultimately depend on effective implementation, sustainable funding, and understanding an ever-evolving digital landscape. Government initiatives designed to expand digital access and skills can help Tennesseans who face barriers and may benefit from sustained attention. As such, policymakers and community partners may want to explore ways to:

- Monitor state progress on TNDOP goals and strategies regularly.
- Develop local digital opportunity plans with community partners.
- Dedicate funding for community-based and individual digital literacy programs for older adults.
- Fund free device programs and transportation services to improve digital literacy program impact.
- Match qualified households with relevant digital access and literacy programs.

---

[1] The funding for this grant program was available as the result of a court ruling (Case No. 11-1548-III, Davidson County Chancery Court, Division III). The Chancery Court decreed that the "funds shall be used to sustain and improve the quality of life for the elderly of Tennessee." The full amount of funding originally available from this court case was $40 million. The majority of these funds were used to support four statewide, multi-year initiatives that provided services to older Tennesseans for dental health, volunteer-assisted transportation, home repair and mobility modifications, and legal assistance. Those grants launched in 2018 and concluded in 2022 and 2023. A copy of the digital literacy grant impact report can be found here. (95)

- Survey older adults to identify digital skill gaps affecting access to key services.
- Stay informed about evolving technologies and address new challenges proactively.
- Reauthorize federal Affordable Connectivity Program funding in part or in full. (65) (64)

Parting Words

Technological advancements have the potential to improve the quality of life of older adults, but this population—particularly those living in Tennessee's rural areas—faces unique barriers to digital literacy. State, federal, and local governments and community partners have taken concerted steps to address these barriers. Leaders at each level may want to consider policy sustainability, monitoring, and adjustment to ensure older adults can realize the full potential of emerging technology.

References

1. **UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training.** Digital Literacy. *TVETipedia Glossary.* [Online] [Cited: March 6, 2024.] https://unevoc.unesco.org/home/TVETipedia+Glossary/show=term/term=Digital+literacy.

2. **American Library Association.** Digital Literacy. [Online] [Cited: March 12, 2024.] https://literacy.ala.org/digital-literacy/.

3. **UNICEF Office of Global Insight and Policy.** Digital Literacy for Children: Exploring Definitions and Frameworks. [Online] August 2019. [Cited: March 6, 2024.] https://www.unicef.org/globalinsight/media/1271/file/%20UNICEF-Global-Insight-digital-literacy-scoping-paper-2020.pdf.

4. **Mamedova, Saida and Pawlowski, Emily.** A Description of U.S. Adults Who Are Not Digitally Literate. *Institute of Education Science: National Center for Education Statistics.* [Online] U.S. Department of Education, May 2018. [Cited: March 12, 2024.] https://nces.ed.gov/pubs2018/2018161.pdf.

5. **Scheckler, Samara, et al.** Pathways Into and Out of Housing Insecurity and Homelessness: Relationships Between Age, Public Program Use, and Housing Stability. *Joint Center for Housing Studies of Harvard University.* [Online] University of Wisconsin-Madison Center for Financial Security, October 1, 2023. [Cited: May 7, 2024.] https://rdrc.wisc.edu/publications/working-paper/wi23-14.

6. **Schott, Liz and Parrott, Sharon.** Using the Internet to Facilitate Enrollment in Benefit Programs: Eligibility Screeners and Online Applications. *Center on Budget and Policy Priorities.* [Online] June 20, 2005. [Cited: June 3, 2024.] https://www.cbpp.org/sites/default/files/archive/12-14-04tanf.pdf.

7. **Tennessee State Data Center, Boyd Center for Business and Economic Research.** Tennessee Population Projections for 2021-2070: Methodology, Executive Summary, and Notes. *Boyd Center Population Projections.* [Online] March 3, 2022. [Cited: March 15, 2024.] https://tnsdc.utk.edu/estimates-and-projections/boyd-center-population-projections/.

8. **Vigilante, Kevin.** The Digital Determinants Of Health: How To Narrow The Gap. *Forbes.* [Online] February 2, 2023. [Cited: May 22, 2024.] https://www.forbes.com/sites/forbestechcouncil/2023/02/02/the-digital-determinants-of-health-how-to-narrow-the-gap/?sh=7369508b59ba.

9. **Phan, Philana, Mitragotri, Samir and Zhao, Zongmin.** Digital Therapeutics in the Clinic. [Online] May 3, 2023. [Cited: June 13, 2024.] https://doi.org/10.1002/btm2.10536.

10. **Badeaux, Rebecca.** When isolation increased, telehealth use went down for older adults. Why? [Online] UC Davis Health, November 8, 2023. [Cited: March 22, 2024.] https://health.ucdavis.edu/news/headlines/when-isolation-increased-telehealth-use-went-down-for-older-adults-why/2023/11#:~:text=The%20study%20determined%20that%20rapid,years%20of%20age%20and%20older..

11. **Centers for Disease Control and Prevention.** Loneliness and Social Isolation Linked to Serious Health Conditions. *Alzheimer's Disease and Health Aging Program.* [Online] April 29, 2021. [Cited: March 21, 2024.] https://www.cdc.gov/aging/publications/features/lonely-older-adults.html.

12. **Rural Health Information Hub.** Telehealth and Health Information Technology in Rural Healthcare. [Online] April 12, 2024. [Cited: May 6, 2024.] https://www.ruralhealthinfo.org/topics/telehealth-health-it#telemedicine-telehealth-differences.

13. **Carrie Henning-Smith, PhD, MPH, MSW.** Meeting the Social Needs of Older Adults in Rural Areas. *Insights | SocialDeterminantsofHealth.* [Online] JAMA Health Forum, November 30, 2020. [Cited: May 6, 2024.] https://jamanetwork.com/journals/jama-health-forum/fullarticle/2773657.

14. **Henning-Smith, Carrie, et al.** Key Informant Perspectives on Rural Social Isolation and Loneliness. *Rural Health Research Gateway.* [Online] University of Minnesota Rural Health Research Center, October 2018. [Cited: May 6, 2024.] http://rhrc.umn.edu/wp-content/files_mf/1539002382UMNpolicybriefKeyInformantPerspectivesonRuralSocialIsolationandLoneliness.pdf.

15. **Choi, Namkee G., et al.** Telehealth Use Among Older Adults During COVID-19: Associations With Sociodemographic and Health Characteristics, Technology Device Ownership, and Technology Learning. [Online] Journal of Applied Gerontology, August 23, 2023. [Cited: May 6, 2024.] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8847316/.

16. **Turcios, Yosselin.** Digital Access: A Super Determinant of Health . *SAMHSA.* [Online] March 22, 2023. [Cited: May 22, 2024.] https://www.samhsa.gov/blog/digital-access-super-determinant-health#1.

17. **Clyburn, Mignon L.** Remarks of Commissioner Mignon L. Clyburn at the Launch of the Mapping Broadband Health in America Platform, Microsoft Innovation and Policy Center. [Online] Federal Communications Commission, 2 August, 2016. [Cited: May 22, 2024.] https://docs.fcc.gov/public/attachments/DOC-340590A1.pdf.

18. **Commission, Federal Communications.** Mapping Broadband Health in America. [Online] October 24, 2023. [Cited: May 22, 2024.] https://www.fcc.gov/health/maps.

19. **Mather, Mark and Scommegna, Paola.** Fact Sheet: Aging in the United States. *Population Reference Bureau.* [Online] January 9, 2024. [Cited: March 19, 2024.] https://www.prb.org/resources/fact-sheet-aging-in-the-united-states/.

20. **Fry, Richard and Braga, Dana.** Older Workers Are Growing in Number and Earning Higher Wages. [Online] Pew Research Center, December 14, 2023. [Cited: May 6, 2024.] https://www.pewresearch.org/social-trends/2023/12/14/the-growth-of-the-older-workforce/.

21. **U.S. Bureau of Labor Statistics.** Civilian Labor Force, by Age, Sex, Race, and Ethnicity. *Employment Projections.* [Online] September 6, 2023. [Cited: March 20, 2024.] https://www.bls.gov/emp/tables/civilian-labor-force-summary.htm.

22. **Coy, Peter.** Working in Old Age Can't Be the Only Answer to the Retirement Crisis. *The New York Times.* [Online] March 15, 2024. [Cited: March 20, 2024.] https://www.nytimes.com/2024/03/15/opinion/retirement-old-age-savings.html.

23. **Hecker, Ian, Spaulding, Shayne and Kuehn, Daniel.** Digital Skills and Older Workers: Supporting Success in Training and Employment in a Digital World. [Online] The Urban Institute, September 2021. [Cited: May 6, 2024.] https://www.urban.org/sites/default/files/publication/104771/digital-skills-and-older-workers_1.pdf.

24. **Eyster, Lauren, Johnson, Richard W. and Toder, Eric.** CURRENT STRATEGIES TO EMPLOY AND RETAIN OLDER WORKERS. [Online] The Urban Insitute, January 2008. [Cited: May 6, 2024.] https://www.urban.org/sites/default/files/publication/31531/411626-Current-Strategies-to-Employ-and-Retain-Older-Workers.PDF.

25. **Tennessee State Data Center, Boyd Center for Business and Economic Research.** Tennessee Population Projections for 2021-2070: 2020-2070 Excel Workbook. [Online] March 3, 2022. [Cited: March 18, 2024.] https://tnsdc.utk.edu/estimates-and-projections/boyd-center-population-projections/.

26. **West End Home Foundation.** SeniorTrust Digital Literacy Impact Report. [Online] Elevate Consulting, LLC, January 2024. [Cited: April 16, 2024.]

27. —. Digital Literacy and Inclusion for Older Tennesseans. *SeniorTrust Grant Program: Serving Older Tennesseans Age 60+.* [Online] [Cited: May 1, 2024.] https://www.westendhomefoundation.org/seniortrust-overview/.

28. —. West End Home Foundation Oversees Distribution of Funds From Court Case . *Grants Awarded to Help Bridge Digital Divide for Older Tennesseans* . [Online] August 3, 2022. [Cited: May 1, 2024.] https://www.westendhomefoundation.org/grants-awarded-to-help-bridge-digital-divide-for-older-tennesseans/.

29. —. Senior Trust Grant Program: Grantee Reports. [Online] [Cited: April 1, 2024.]

30. **Ring, Julian.** 30 years ago, one decision altered the course of our connected world. *ALL THINGS CONSIDERED.* [Online] April 30, 2023. [Cited: March 14, 2024.] https://www.npr.org/2023/04/30/1172276538/world-wide-web-internet-anniversary.

31. **United States Department of Commerce: National Telecommunications and Information Administration.** Digital Nation Data Explorer. [Online] October 5, 2022. [Cited: March 14, 2024.]

32. **U.S Census Bureau.** "Age by Presence of a Computer and Types of Internet Subscription in Household." American Community Survey, ACS 1-Year Estimates Detailed Tables, Table B28005, 2022. *Explore Census Data.* [Online] [Cited: April 9, 2024.] https://data.census.gov/table/ACSDT1Y2022.B28005?q=B28005&g=040XX00US47.

33. **Pew Research Center.** Social Media Fact Sheet. [Online] January 31, 2024. [Cited: March 22, 2024.] https://www.pewresearch.org/internet/fact-sheet/social-media/.

34. **Vogels, Emily A.** Millennials stand out for their technology use, but older generations also embrace digital life. *Older Adults and Tech.* [Online] September 9, 2019. [Cited: March 21, 2024.] https://www.pewresearch.org/short-reads/2019/09/09/us-generations-technology-use/.

35. **McKinsey and Company.** The state of AI in 2023: Generative AI's breakout year. [Online] August 1, 2023. [Cited: March 22, 2024.] https://www.mckinsey.com/capabilities/quantumblack/our-insights/the-state-of-ai-in-2023-generative-ais-breakout-year#/.

36. **Gregoire, Courtney.** Increased uptake of generative AI technology brings excitement and highlights the importance of family conversations about online safety, says new research from Microsoft. [Online] Microsoft, February 2, 2024. [Cited: March 22, 2024.] https://blogs.microsoft.com/on-the-issues/2024/02/05/generative-ai-online-safety-day-global-survey/.

37. **Vogels, Emily A.** Digital divide persists even as Americans with lower incomes make gains in tech adoption. *Digital Divide.* [Online] June 22, 2021. [Cited: March 13, 2024.] https://www.pewresearch.org/short-reads/2021/06/22/digital-divide-persists-even-as-americans-with-lower-incomes-make-gains-in-tech-adoption/.

38. **U.S. Census Bureau.** "Household Income in the Last 12 Months (in 2022 Inflation-Adjusted Dollars) by Presence and Type of Internet Subscription in Household." American Community Survey, ACS 1-Year Estimates Detailed Tables, Table B28004. *Explore Census Data.* [Online] 2022. [Cited: April 9, 2024.] https://data.census.gov/table/ACSDT1Y2022.B28004?q=B28004&g=040XX00US47.

39. —. "Median Household Income in the Past 12 Months (in 2022 Inflation-Adjusted Dollars) by Age of Householder." American Community Survey, ACS 1-Year Estimates Detailed Tables, Table B19049, 2022. *Explore Census Data.* [Online] 2022. [Cited: April 9, 2024.] https://data.census.gov/table/ACSDT1Y2022.B19049?q=B19049&g=040XX00US47.

40. **Logue, Ann C.** A Boomer Retirement Bomb Is About to Blow Up America's Economy. *Business Insider.* [Online] January 10, 2024. [Cited: March 20, 2024.] https://www.businessinsider.com/boomers-not-enough-retirement-savings-gen-z-millennials-eldercare-2024-1#:~:text=The%20great%20baby%2Dboomer%20retirement,will%20have%20a%20comfortable%20retirement.

41. **Henderson, Sarah.** 2021 Income, Poverty, Health Insurance Coverage, and Education in Tennessee's 95 Counties. [Online] The Sycamore Institute, March 28, 2023. [Cited: March 22, 2024.] https://www.sycamoreinstitutetn.org/2021-income-poverty-education-insurance/.

42. **Whitacre, Brian.** Research and Analysis: Rural Internet Subscribers Pay More, New Data Confirms. *Broadband and Technology.* [Online] The Daily Yonder, November 28, 2023. [Cited: April 10, 2024.] https://dailyyonder.com/research-and-analysis-rural-internet-subscribers-pay-more-new-data-confirms/2023/11/28/#:~:text=The%20data%20show%20that%20in,many%20ways%2C%20this%20is%20expected..

43. **Alexander Hermann, Whitney Airgood-Obrycki.** In Search of Rural: How Varying Definitions Shape Housing Research. *Joint Center for Housing Studies of Harvard University.* [Online] Joint Center for Housing Studies of Harvard University, 2 7, 2024. [Cited: 2 23, 2024.] https://www.jchs.harvard.edu/sites/default/files/research/files/harvard_jchs_in_search_of_rural_hermann_obrycki_2024.pdf.

44. **Federal Communications Commission.** FCC INCREASES BROADBAND SPEED BENCHMARK. [Online] March 14, 2024. [Cited: April 15, 2024.] https://docs.fcc.gov/public/attachments/DOC-401205A1.pdf.

45. **Willcox, James K. and Bergman, Andy.** How Much Internet Speed Do You Need? *Electronics & Computers.* [Online] Consumer Reports, December 18, 2023. [Cited: April 15, 2024.] https://www.consumerreports.org/electronics/internet/how-much-internet-speed-do-you-need-a1714131782/.

46. **Domingo, Joel Santo.** You (Probably) Don't Need Gigabit Internet. *Wirecutter.* [Online] The New York Times, March 9, 2023. [Cited: April 15, 2024.] https://www.nytimes.com/wirecutter/blog/what-is-gigabit-internet-do-you-need-it/.

47. **Speed Test.** United States Median Country Speeds March 2024. [Online] March 2024. [Cited: April 15, 2024.] https://www.speedtest.net/global-index/united-states?fixed#market-analysis.

48. **Federal Communications Commission.** FCC National Broadband Map. [Online] April 3, 2024. [Cited: April 15, 2024.] https://broadbandmap.fcc.gov/area-summary/fixed?version=jun2023&geoid=47&type=state&zoom=6.09&vlon=-87.123083&vlat=35.217670&br=b&speed=1000_100&tech=1_2_3.

49. **United States Census Bureau.** Urban and Rural: County-level 2020 Census Urban and Rural Information for the U.S., Puerto Rico, and Island Areas sorted by state and county FIPS codes. [Online] September 2023. [Cited: February 28, 2024.] https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural.html.

50. **U.S. Census Bureau.** U.S. Census Bureau. "Age and Sex." American Community Survey, ACS 5-Year Estimates Subject Tables, Table S0101. *Explore Census Data.* [Online] 2022. [Cited: April 16, 2024.] https://data.census.gov/table/ACSST5Y2022.S0101?q=age&g=010XX00US_040XX00US47,47$0500000.

51. —. "Median Household Income in the Past 12 Months (in 2022 Inflation-Adjusted Dollars) by Age of Householder." American Community Survey, ACS 5-Year Estimates Detailed Tables, Table B19049. *Explore Census Data.* [Online] 2022. [Cited: April 16, 2024.] https://data.census.gov/table/ACSDT5Y2022.B19049?q=B19049&g=010XX00US_040XX00US47,47$0500000&tp=false.

52. **Federal Bureau of Investigation: Internet Crime Complaint Center.** 2022 Elder Fraud Report. [Online] [Cited: May 7, 2024.] https://www.ic3.gov/Media/PDF/AnnualReport/2022_IC3ElderFraudReport.pdf.

53. —. 2023 Elder Fraud Report. [Online] [Cited: May 7, 2024.] https://www.ic3.gov/Media/PDF/AnnualReport/2023_IC3ElderFraudReport.pdf.

54. **Morgan, Rachel E. and Tapp, Susannah N.** Examining Financial Fraud Against Older Adults. [Online] U.S. Department of Justice, Office of Justice Programs, National Institute of Justice. https://nij.ojp.gov/topics/articles/examining-financial-fraud-against-older-adults.

55. **James, Bryan D., Boyle, Patricia A. and Bennett, David A.** HHS Author Manuscripts: Correlates of Susceptibility to Scams in Older Adults Without Dementia. *National Library of Medicine: National Center for Biotechnology Information .* [Online] 2014. [Cited: March 21, 2024.] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3916958/.

56. **Dyakon, Tina.** Poynter's MediaWise training significantly increases people's ability to detect disinformation, new Stanford study finds. *Poynter.* [Online] The Poynter Institute for Media Studies, Inc., December 14, 2020. [Cited: April 12, 2024.] https://www.poynter.org/news-release/2020/poynters-mediawise-training-significantly-increases-peoples-ability-to-detect-disinformation-new-stanford-study-finds/.

57. **Moore, Ryan C. and Hancock, Jeffrey T.** A Digital Media Literacy Intervention for Older Adults Improves Resilience to Fake News. *Scientific Reports.* [Online] Springer Nature, April 9, 2022. [Cited: April 12, 2024.] https://doi.org/10.1038/s41598-022-08437-0.

58. **King, Heather, et al.** New Digital Equity Act Population Viewer Shows Broadband Access and Demographic Characteristics. [Online] U.S. Census Bureau, May 13, 2022. [Cited: April 12, 2024.] https://www.census.gov/library/stories/2022/05/mapping-digital-equity-in-every-state.html.

59. **Tennessee Department of Economic and Community Development.** The State of Tennessee Digital Opportunity Plan. [Online] January 2024. [Cited: April 11, 2024.] https://www.tn.gov/content/dam/tn/ecd/documents/broadband/digital-opportunity/TN_DO%20PLAN.pdf.

60. **U.S. Department of Commerce: National Telecommunications and Information Administration.** Programs. *Internet for All.* [Online] National Telecommunications and Information Administration. [Cited: April 10, 2024.] https://www.internetforall.gov/programs.

61. —. Funding by State/Territory. *Internet for All.* [Online] National Telecommunications and Information Administration. [Cited: April 10, 2024.] https://www.internetforall.gov/funding-recipients?state=TN&form_build_id=form-fWRzZMPqhtD21jKovm8gk_5uMhgE14zKborx4HVJGgw&form_id=ntia_interactive_map_state_and_program_selection.

62. **Fung, Brian.** Here's how much each state will get in the $42.5 billion broadband infrastructure plan. [Online] CNN, June 26, 2023. [Cited: March 22, 2024.] https://www.cnn.com/2023/06/26/tech/broadband-infrastructure-biden/index.html.

63. **U.S. Department of Commerce: National Telecommunications and Information Administration.** Biden-Harris Administration Announces $813.3 Million to Tennessee for High-Speed Internet Infrastructure. *Internet for All.* [Online] National Telecommunications and Information Administration, June 30, 2023. [Cited: April 10, 2024.] https://www.internetforall.gov/news-media/biden-harris-administration-announces-8133-million-tennessee-high-speed-internet-0.

64. **Universal Service Administrative Company.** ACP Enrollment and Claims Tracker. [Online] [Cited: March 22, 2024.] https://www.usac.org/about/affordable-connectivity-program/acp-enrollment-and-claims-tracker/.

65. **Federal Communications Commission.** Affordable Connectivity Program: The ACP Is Winding Down. [Online] March 20, 2024. [Cited: March 22, 2024.] https://www.fcc.gov/acp.

66. **Tennessee Department of Economic and Community Development.** Digital Skills, Education, and Workforce Development Program (DSEW). *Digital Opportunity Grants.* [Online] [Cited: May 6, 2024.] https://www.tn.gov/ecd/rural-development/broadband-office/grants/digital-opportunity-grants.html.

67. **Tipton, Lindsey.** Governor Lee, Commissioner McWhorter Announce $163 Million in Funding to Furterh Expand Broadband. [Online] Tennessee Department of Economic and Community Development, April 30, 2024. [Cited: May 8, 2024.] https://tnecd.com/news/governor-lee-commissioner-mcwhorter-announce-163-million-in-funding-to-further-expand-broadband/#:~:text=Certified%20Sites-,Governor%20Lee%2C%20Commissioner%20McWhorter%20Announce%20%24163%20Million,Funding%20to%20Further%20Expand%2.

68. **Tennessee Advisory Commission on Intergovernmental Relations.** TACIR_broadband_Tables_2024-01-25_for Senate Finance (1-30-24). [Online] 2024. [Cited: May 6, 2024.] https://drive.google.com/file/d/1rJYLQ3XBnWXdKoVcAoT0qeOuCyMQAHOf/view.

69. **Jones, Vivian and Brown, Melissa.** $163M in broadband funding coming to Tennessee communities. *The week in politics: How US Rep. Andy Ogles is using tax dollars on digital ad buys.* [Online] The Tennessean, May 6, 2024. [Cited: May 6, 2024.]

70. **Tennessee Department of Economic and Community Development.** Broadband Grant Overviews. *Grants.* [Online] [Cited: April 11, 2024.] https://www.tn.gov/ecd/rural-development/broadband-office/grants.html.

71. **U.S. Department of Commerce: National Telecommunications and Information Administration.** Tennessee's Digital Equity Plan Accepted. *Internet for All.* [Online] National Telecommunications and Information Administration, March 28, 2024. [Cited: April 10, 2024.] https://www.internetforall.gov/news-media/tennessees-digital-equity-plan-accepted.

72. —. Biden-Harris Administration Announces More Than $15.8 Million to Tennessee to Increase Digital Inclusion Efforts. *Internet for All.* [Online] March 29, 2024. [Cited: April 10, 2024.] https://www.internetforall.gov/news-media/biden-harris-administration-announces-more-158-million-tennessee-increase-digital.

73. **Tech Goes Home Chattanooga.** Tech Goes Home Modules. [Online] [Cited: April 16, 2024.] https://www.techgoeshomecha.org/for-participants.html.

74. **Tennessee Department of Economic and Community Development.** Get Online Skills Training. [Online] [Cited: April 16, 2024.] https://www.tn.gov/ecd/rural-development/broadband-office/redirect-individual-and-family-resources-/get-online-skills-training0.html.

75. —. Tennessee Broadband Accessibility Act. *Broadband Accessibility.* [Online] [Cited: April 11, 2024.] https://www.tn.gov/ecd/rural-development/tennessee-broadband-grant-initiative/tennessee-broadband-accessibility-act-article.html.

76. **Department of Economic and Community Development.** Broadband Accessibility Grant Report – FY2019-2021. *Tennessee Broadband Accessibility Act.* [Online] April 23, 2021. [Cited: April 11, 2024.] https://www.tn.gov/content/dam/tn/ecd/documents/FY21%20Broadband%20Legislative%20Annual%20Report.pdf.

77. **State of Tennessee.** Reserve balance information from the FY 2006-FY 2019 State Budgets. [Online] Available via https://www.tn.gov/finance/fa/fa-budget-information/fa-budget-archive.html.

78. **Tennessee General Assembly Office of Legislative Budget Analysis.** "Reserves" from the 2018 Budget Summary Session Report. [Online] May 11, 2018.

http://www.capitol.tn.gov/Archives/Joint/staff/budget-analysis/docs/FY%2018%2019%20Post%20Session%20Summary%205%2011.pdf.

79. **Kahan, John and Ferres, Juan Lavista.** United States Broadband Usage Percentages Dataset. [Online] Microsoft Corporation, June 2, 2021. [Cited: March 5, 2024.] https://github.com/microsoft/USBroadbandUsagePercentages.

80. **The Pew Charitable Trusts.** How Much Broadband Speed Do Americans Need? [Online] Novemeber 30, 2020. [Cited: March 12, 2024.] https://www.pewtrusts.org/en/research-and-analysis/articles/2020/11/30/how-much-broadband-speed-do-americans-need#:~:text=A%3A%20Broadband%20is%20reliable%20high,megabits%20per%20second%20for%20uploads..

81. **van Deursen, A.J.A.M. and van Dijk, J.A.G.M.** Modeling Traditional Literacy, Internet Skills and Internet Usage: An Empirical Study. *Interacting with Computers, Vol. 28 No.1.* [Online] January 2016. [Cited: March 12, 2024.] https://academic.oup.com/iwc/article-abstract/28/1/13/2363661?redirectedFrom=fulltext#no-access-message.

82. **Caplan, Zoe.** U.S. Older Population Grew From 2010 to 2020 at Fastest Rate Since 1880 to 1890. *U.S. Census Bureau.* [Online] May 25, 2023. [Cited: March 15, 2024.] https://www.census.gov/library/stories/2023/05/2020-census-united-states-older-population-grew.html.

83. **U.S. Census Bureau.** Table 2. Projected Population by Age Group and Sex. *2023 National Population Projections Tables: Main Series.* [Online] November 2023. [Cited: March 18, 2024.] https://www.census.gov/data/tables/2023/demo/popproj/2023-summary-tables.html.

84. —. Table 3. Projected Population by Five-Year Age Group and Sex. *2023 National Population Projections Tables: Main Series.* [Online] November 2023. [Cited: March 18, 2024.] https://www.census.gov/data/tables/2023/demo/popproj/2023-summary-tables.html.

85. **Centers of Disease Control and Prevention: National Center for Health Statistics.** Table LExpMort. Life expectancy at birth, age 65, and age 75, by sex, race, and Hispanic origin: United States, selected years 1900–2019. *Health, United States – Data Finder.* [Online] [Cited: March 19, 2024.] https://www.cdc.gov/nchs/hus/data-finder.htm?&subject=Life%20expectancy.

86. **Centers for Disease Control and Prevention: National Center for Health Statistics.** Life Expectancy Increases, However Suicides Up in 2022. *NCHS Pressroom.* [Online] November 29, 2023. [Cited: March 19, 2024.] https://www.cdc.gov/nchs/pressroom/nchs_press_releases/2023/20231129.htm.

87. **Ohlheiser, A.W.** Gen Z falls for online scams more than their boomer grandparents do. [Online] Vox, September 21, 2023. [Cited: March 21, 2024.] https://www.vox.com/technology/23882304/gen-z-vs-boomers-scams-hacks.

88. **U.S. Federal Trade Commission.** Who experiences scams? A story for all ages . *Data Spotlight.* [Online] December 8, 2022. [Cited: March 21, 2024.] https://www.ftc.gov/news-events/data-visualizations/data-spotlight/2022/12/who-experiences-scams-story-all-ages.

89. **Romig, Kathleen.** Social Security Lifts More People Above the Poverty Line Than Any Other Program. [Online] Center on Budget and Policy Priorities, January 31, 2024. [Cited: March 21, 2024.] https://www.cbpp.org/research/social-security/social-security-lifts-more-people-above-the-poverty-line-than-any-other.

90. **U.S. Census Bureau.** Digital Equity Act of 2021. [Online] June 15, 2023. [Cited: March 12, 2024.] https://www.census.gov/programs-surveys/community-resilience-estimates/partnerships/ntia/digital-equity.html.

91. —. U.S. Census Bureau. "Median Household Income in the Past 12 Months (in 2022 Inflation-Adjusted Dollars) by Age of Householder." American Community Survey, ACS 5-Year Estimates Detailed

Tables, Table B19049. [Online] 2022. [Cited: April 16, 2024.]
https://data.census.gov/table/ACSDT5Y2022.B19049?q=B19049&g=010XX00US_040XX00US47,47$05
00000&tp=false. Accessed .

92. **The West End Home Foundation.** Digital Literacy Programming: Summary of Survey Findings.
[Online] September 8, 2023. [Cited: March 4, 2024.]

93. **Rural Information Hub.** Rural Social Isolation, with Carrie Henning-Smith . [Online] July 11, 2023.
[Cited: May 6, 2024.] https://www.ruralhealthinfo.org/podcast/social-isolation-jul-2023.

94. **Henning-Smith, Carrie.** Meeting the Social Needs of Older Adults in Rural Areas. *Insights Social
Determinants of Health.* [Online] JAMA Health Forum, November 30, 2020. [Cited: May 6, 2024.]
https://jamanetwork.com/journals/jama-health-forum/fullarticle/2773657.

95. **The West End Home Foundation in partnership with the SeniorTrust Consortium.** Final Impact
Report. *Digital Literacy and Inclusion for Older Tennesseans.* [Online] July 2024. [Cited: July 29, 2024.]
https://www.westendhomefoundation.org/seniortrust-overview/#literacy.