Arlington County
Digital Equity Access Project (DEAP)

Final Report
August 2020

Reingold

EXECUTIVE SUMMARY

Arlington County seeks digital equity for all its residents and, where possible, to address the causes of digital inequity within the County. Equity refers to the assurance that all individuals have the digital technology access, capacity, and understanding required to effectively use the Internet. Digital equity is more than being connected to the Internet — it also involves affordable broadband service and functional devices, as well as education and training that improves interest, knowledge and relevance of the Internet in the multiple cultures found in Arlington County.

Digital disparity is inescapable when the cost of service or the price of devices are too high for people with little or no disposable income. Alternatively, digital disparities can occur when people, even relatively affluent ones, lack the understanding, context, or education necessary to navigate the Internet and use it to benefit their lives. When disparities prevail, some individuals, households, and even whole population segments go digitally underserved.

Lack of connectivity and limited connectivity drive digital inequity most. Connectivity involves sufficient online capacity for digital platforms, systems, and applications to work together quickly and seamlessly, which in turn depends on broadband Internet (e.g., cable, fiber, optic, satellite, DSL).[1] Connectivity is especially important in Arlington County, as it is the most urban and densely populated county in Virginia and will soon be the second headquarters of Amazon. In Arlington County, commerce, job searches, work, education, health care, faith services, news, entertainment, social interaction, government interaction, civic engagement, and political forums — as well as most every other aspect of daily existence — increasingly happen online. However, according to the Census Bureau's American Community Survey 5-year estimates, 1 in 6 Arlington County households (16%) do not have access to a fixed home broadband Internet connection.[2]

The importance of reliable connectivity in Arlington County has been underscored by the COVID-19 pandemic, as state and local governments have encouraged and at times mandated businesses, government offices, and schools to close, and have restricted access to other high-risk places such as senior centers. These measures may be in place for months or even years as vaccines are developed. The COVID-19 pandemic has made it obvious that digital equity in Arlington County is as essential as dependable electricity or safe drinking water.

In an effort to collect data on digital equity in the County, the Digital Equity Access Project contracted with Reingold to conduct focus groups and one-on-one interviews with digitally underserved individuals in early June. Additionally, Reingold's team conducted a countywide phone survey in late June. Improved quality of broadband service matters greatly to the panelists we interviewed. For example, 50% of Arlington County households with school-age children report there is sometimes insufficient Wi-Fi to support their devices, a problem that has increased in recent months due to COVID-19 stay-at-home orders. Similarly, we heard from panelists drawn from digitally underserved audiences that they want more choices among

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[1] See "Digital Equity in Arlington," Digital Inclusion Network, Dec. 3, 2019.
[2] See "Digital Equity in Arlington," Digital Inclusion Network, Dec. 3, 2019.

providers to lower cost as well as improve connectivity. We learned from focus group research as well as the countywide poll that those who are typically digitally underserved include older adults or adults with disabilities who typically have fixed incomes; lower-income households; and members of recent immigrant groups.

We also learned that ever-increasing broadband demand combined with inconsistent service is especially common for residents in older buildings such as those often found in ZIP codes 22203, 22204, and 22206; in senior centers; and in Arlington County households with three or more members wherever found. Households with three or more members typically have multiple people simultaneously using broadband for work, school, entertainment, and socializing.

Hispanic residents constitute about 1 in 6 households (~16%) countywide, and about 1 in 3 households (34%) in the County with children at home are of Hispanic background. According to our countywide survey, Hispanic households are typically larger — often three or more household members — and often have school-age children living at home. Schoolwork has moved almost exclusively online, and most households with children have at least occasional problems with their connectivity and the ability to support all their devices.

We learned in focus groups and from the countywide poll that improved connectivity matters almost as much as more affordable service. If improved connectivity and sufficient capacity for digital platforms, systems, and applications were accessible through more affordable broadband plans, then digital equity would improve in Arlington County.

The benefits of digital equity would be enormous even for households that are not in the digital vanguard. To name only a few: Thousands of Arlington County schoolchildren would be finishing their homework at home and not at McDonald's or in parked cars outside the school because they lack connectivity or have limited connectivity due to rising broadband demand in households taking precautions against COVID-19; thousands of adults would have greater access to job opportunities at a time when unemployment is on the rise; while still other County residents, such as people who have disabilities or are 65 and older, could use telehealth services whenever practical, decreasing taxpayer-supported emergency room costs and unnecessary urgent care visits.

In conducting focus groups and one-on-one interviews with Arlington County residents, there were five areas in which residents identified ways to address digital inequity:

- Encourage competition from multiple providers.
- Publicize Comcast Internet Essentials more widely in low-income and minority communities.
- Offer free or greatly reduced-cost Wi-Fi for the most basic plans to provide choices beyond Comcast Internet Essentials.[3]
- Improve broadband quality and enable dependable connectivity in older buildings.

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[3] Estimates and recommendations for affordable Internet vary, but a realizable target might be 2% of the average monthly income for a family earning at least $75,000 annually, which is approximately $125 monthly. See "Digital Equity in Arlington," Digital Inclusion Network, Dec. 3, 2019.

- Expand outreach efforts to members of communities speaking a language other than English in order to address and improve issues of digital relevance, education, and training.

RESEARCH OBJECTIVE

Arlington County seeks to define digital equity and, where possible, address the gaps causing inequities. The objective of this research is to assess the current state of digital connectivity and identify any barriers preventing Arlington residents from accessing and using digital tools and resources.

QUANTITATIVE AND QUALITATIVE METHODOLOGY

Arlington County's Digital Equity team contracted with Reingold in January 2020 to conduct a countywide survey of residents as well as a series of focus groups.

From June 18 to June 21, 2020, Reingold conducted 200 telephone interviews of Arlington County residents (n=200) with an oversample of interviews in ZIP codes 22203, 22204, and 22206, which consist of the highest percentage of underserved households in the County. Interviews were conducted in two languages: Spanish and English. The overall margin of error is +/- 6.9% at the 95% confidence level.

Arlington County residents shared their opinions on the following broad categories of digital equity issues:

- The current state of their broadband service.
- Changes in usage since the COVID-19 state-of-emergency declaration in March 2020.
- Impact of connectivity on distance learning, especially for households with school-age children.
- Desired changes in service.
- Trade-offs in terms of service versus cost priorities.

In addition to the telephone survey, from June 8 to June 12, we conducted three one-on-one interviews and eight focus groups. The focus groups consisted altogether of 28 panelists chosen from minority community households or low- or fixed-income households. We considered anyone who qualified for County services to be in the low-income category. Twenty-eight panelists took part using Zoom, as it worked best across all operating systems and devices. Four of the twenty-eight panelists participated by phone because of limited access to Wi-Fi. We conducted two groups exclusively with Spanish-language speakers; one group with native Mongolian-language speakers, with one panelist acting as a translator; two groups with residents who have disabilities; and two groups of adults 65 and older. Four groups were a mix of residents with white, Black, Hispanic, Middle Eastern, and Asian ethnicities. Ten panelists came from first-generation Peruvian, Salvadorian, Egyptian, and Mongolian households. Ages ranged from the 20s to 80s.

With the switch to online focus groups, we expanded the process from our original schedule to include the three one-on-one interviews as well four additional focus groups of up to five people. Fewer participants per group ensured active participation by County residents, especially those who are 65 and older or are not particularly digitally oriented. All results were recorded. Working with Reingold, Amy Kauffman moderated the English-speaking groups, and Carlos Alcazar moderated the Spanish-speaking groups.

KEY FINDINGS

1. Current Status of Panelists' Internet Demographics
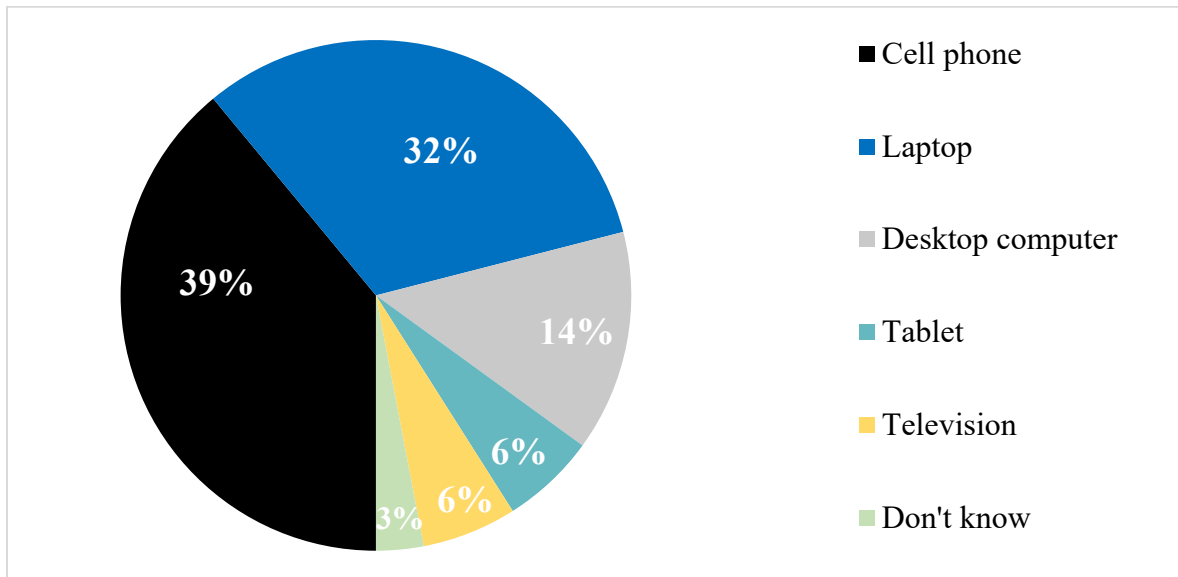
Devices

In the qualitative research, the number of devices in homes ranged from one — a single smartphone — to 10 (three cellphones, four tablets, two laptops, and one TV for a family of five). The average was three or more devices per home, with cellphones, tablets, and personal computers being the most common devices. In both focus groups of adults 65 and older, there was a preference for larger devices for easier viewing.

In the countywide survey of residents, we found that 3 in 4 residents (74%) have four or more devices at home. Almost all households with three or more people (95%) have four or more devices; 95% of Hispanic residents have four or more devices; and households that pay less than $49 for Wi-Fi/Internet service are more likely than not (61%) to have four or more devices.

In the focus groups, there was no clear preference for one digital device over another. In the countywide survey, cellphones are used most to connect to the Internet (39%), with laptop usage a close second (32%). More affluent Arlington County households, those that pay on average more than $150 monthly for Wi-Fi/Internet service, are more likely to use a computer more than a cellphone. Two in five (42%) use a computer, compared with 32% overall.

Figure 1: Most common devices used for Internet connection

Household digital devices are common in Arlington County, but sharing devices is common especially in larger or more crowded households. Arlington County residents in households of three or more people are more likely to share devices (57%) than are residents as a whole (41%), typically because the children need to be online for school but also because the adults may be working remotely or completing other tasks online. Households in which people share devices are significantly more likely (63%) to experience connectivity challenges during online learning than those who do not share devices (42%).

Most Arlington County residents (62%) say they have enough Wi-Fi connection in their home to operate without interruption or buffering, but a large minority (37%) has trouble at times — a disconcerting percentage if we view Internet access as something that needs to be constant and dependable, similar to electricity and water service, which are 99% or more dependable. Just as when a power outage plunges us into darkness, without Internet we lose connection to our work, school, and community.

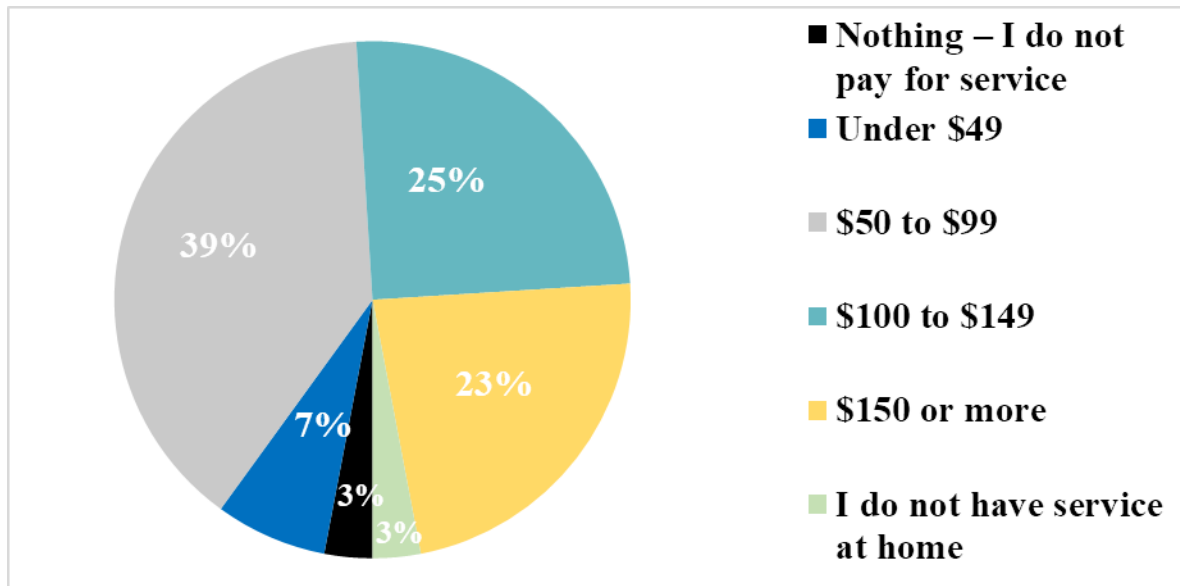**Figure 2: Sizable minority reports trouble with home Wi-Fi connection**
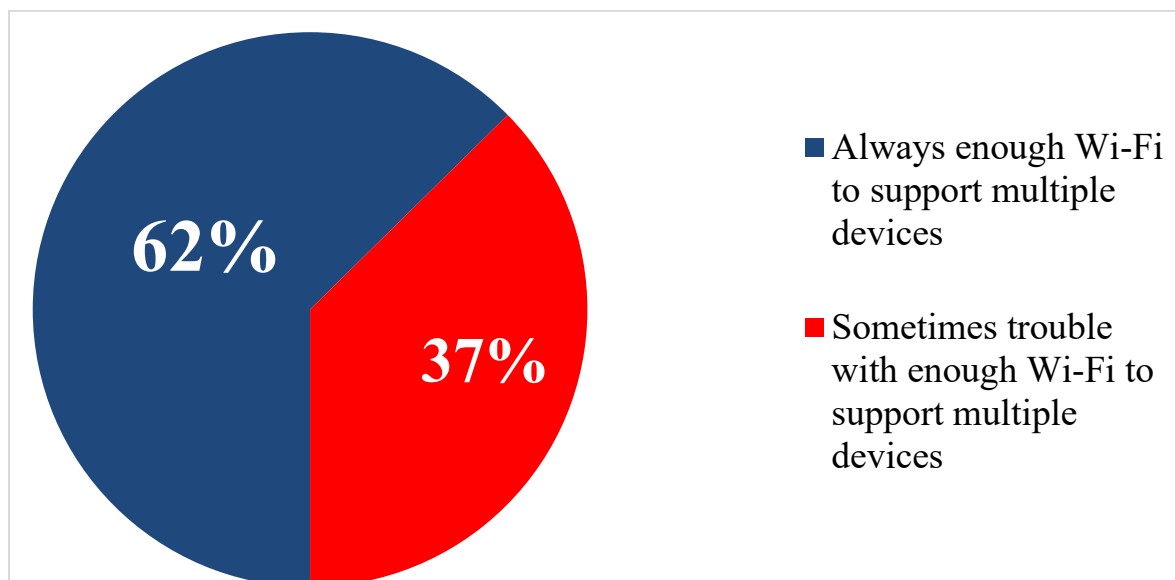
Similarly, connectivity for distance learning depends not just on constancy and dependability of service but also on high-speed bandwidth. Fifty percent of families with children living at home in Arlington County report Wi-Fi spottiness during distance learning.

- "I get no response because it's not logging in … so I turn to the phone to get contact."

- "When there's a lot of people connected, it does take a lifetime to get going and loading and loading. You get frustrated because it is not as strong."

- "I have three kids. When all of them have class, connecting to the Internet slows down. Then stops and comes back, but so slow. … Only kids can use it, and it does not work for them."

A person's device preference depends on the task, with laptops used most often for schoolwork, and cellphones used for entertainment and social interaction. Age also factors into device selection, as people 65 and older tend to favor larger devices, such as a large monitor or smart television, to connect. The following are typical comments from focus group participants concerning devices, device use, and device limitations:

- "My son spends a lot of time on his phone when not doing schoolwork (where he uses laptop), and I use my phone because my computer is just big and bulky and it's not easy."

- "I usually have it [cellphone] with me all the time, so I'm always listening or watching something."

- "At my age, it's tough to see screens. Bigger screens are better."

The following word cloud illustrates the most commonly used words across all focus groups and one-on-one interviews.

Figure 3: Words most commonly used by panelists

Cost of Home Internet

In focus groups and one-on-one interviews with low- or fixed-income panelists, we heard a wide range of costs, from as low as $9.95 per month for the Comcast Internet Essentials plan (Internet access only with limited speed) to $131 per month for Comcast Triple Play (Internet, phone, and cable). The most expensive Internet-only plan was $87 monthly. Six panelists mentioned the Comcast Internet Essentials program by name when discussing price and plans. Nine panelists do not pay for Internet themselves and so they did not know the cost of service: Four with disabilities have family members or guardians who pay; three use phones to connect but have no broadband service; another uses building group access; and one borrows a friend's password to access for free.

In the survey of Arlington County residents, we found that broadband Internet rates that residents are paying are fairly evenly distributed among $50-$99 per month (39%), $100-$149 per month (25%), and $150 or more per month (23%). Hispanic residents (58%) tend to pay less — between $50 and $99 monthly — than other County residents taken as a whole.

Figure 4: Wi-Fi monthly rates

Comcast Internet Essentials

Comcast Internet Essentials is a plan that offers low-income households Internet access only for $9.95 per month. In focus groups among digitally underserved populations, six panelists stated they had switched to Internet Essentials recently. Of these six, one was in a group of adults 65 and older, three were in a low-income group, and two were in a low-income parent group. Two panelists mentioned they tried to enroll but did not qualify. None of the panelists who speak a language other than English knew of the program, and only one of the six senior panelists had heard of the program. There was also confusion as to how to qualify for the Internet Essentials program. Some mentioned qualifying factors such as a Medicaid card, enrollment in a public school, or a low income, and some thought a qualifying factor was having a child in a free lunch program. Those panelists who have Internet Essentials seemed happy with it, but some wondered how long they would continue to enjoy this means-based benefit.

The following are comments concerning Comcast Internet Essentials:

- "I didn't qualify because of the simple fact that my daughter didn't receive free or reduced lunch at school."

- "It would be great if we all had free Wi-Fi, but $10 a month, that's [a] pretty, pretty good deal."

- "This is good now. But it was only for three months and I don't know what we'll do then."

Spotty Wi-Fi in Some Older Buildings, Peak-Period Slowdowns

Most Arlington County residents (92%) report that they have not needed to go outside their home to connect to the Internet, though we also learned those who have a spotty Internet connection don't necessarily leave home to seek a better one. Instead, these residents deal with spotty Internet in other ways, such as shifting what time they connect — for example, avoiding the times that their children need to connect to attend class or that people stream the evening's entertainment. Others mention moving to a room in their house that gets better reception.

In both focus groups consisting of panelists 65 and older, we heard coverage was spotty at times in the senior living facilities as well as in the older buildings those panelists occupy. Similarly, other panelists who live in apartments mentioned losing Internet connection when leaving the apartment and entering common hallways, lobbies, or some other dead zones. The panelists who mentioned these problems also mentioned they lived in large, older buildings such as those often found in ZIP codes 22203, 22204, and 22206.

It seems reasonable to assume that older buildings do present more trouble in terms of wireless connectivity, possibly because of design issues or the use of more impermeable materials in older buildings, such as plaster walls versus Sheetrock. But the bigger issue is that true Internet speed is the relationship between bandwidth (how much) and latency (how fast). In larger buildings or senior centers, where hundreds of people may be sharing the same allocation of bandwidth, there are peak-period slowdowns for users. Hundreds of users in one location, with households connecting three or more devices on average, is simply too much. Here are some comments concerning spotty service:

- "It becomes unreliable, especially after 5 o'clock at night. That's the witching hour for Wi-Fi to disappear."

- "I sometimes have to go to my bathroom [where the signal is stronger]."

- "We have four kids and two parents. Three are school-age kids. Five of us get online. The Wi-Fi [is] so slow. Kids say, 'Mommy, Daddy, can you disconnect from Wi-Fi?'"

- "This building was built in 1957, and the only way you can get either Verizon or Comcast or Xfinity is to start paying an exorbitant amount of money … over $60 a month."
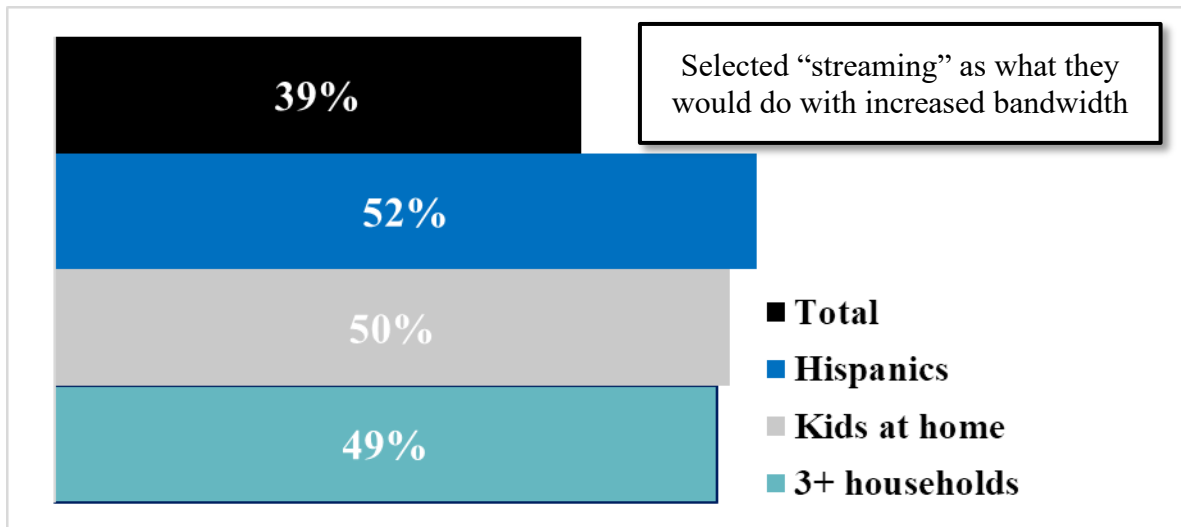
Figure 5: Words most commonly used by focus group panelists 65 and older and living in older buildings or senior centers

2. How Residents Would Use More Broadband Access

When Arlington County residents were asked how they would use an increase in their bandwidth if there was no additional cost, 39% say they would use it for entertainment, such as streaming more shows or movies, or playing more video games. Approximately half of Hispanic residents (52%), half of people with children living at home (50%), and almost half of households with three or more people (49%) said they would use an increase in bandwidth for streaming purposes. (Multiple responses permitted.)

Figure 6: Panelists would use increased bandwidth for streaming

Selected "streaming" as what they would do with increased bandwidth

- Total: 39%
- Hispanics: 52%
- Kids at home: 50%
- 3+ households: 49%

Another 2 in 5 Arlington County residents (43%) overall say they would prioritize either their job and job searches (26%) or their education and schoolwork needs (17%) with expanded broadband access. Education and schoolwork includes distance learning, distance training, online research, admissions, tutoring, and the use of help sites.

County residents with spotty Internet coverage (35%) are more likely than those who report reliable Internet coverage (19%) to want more broadband to improve their remote working or to conduct job searches. There is likely rising interest in improved connectivity due to future employment concerns; we heard from several panelists who had been furloughed or lost hours as a result of the pandemic.

Similarly, County residents with spotty Internet (24%) are twice as likely than those with reliable coverage (12%) to want more broadband for education and schoolwork purposes.

With more tasks being done within the home due to the pandemic, residents are connecting online in new ways for medical advice. Almost half of all panelists we interviewed (13) have had online doctor appointments for the first time as a result of the pandemic. Some of their physicians had their own portal, while others used Microsoft Teams, Zoom, or FaceTime. All panelists said they would continue to use online medical advice and supervision, though two also reported multiple service interruptions during the appointment, due to buffering and a need to reconnect.

Another bright spot for several digitally disadvantaged Arlington County residents we interviewed is that online connection enabled their spiritual lives. Seven panelists attended religious services online. Respondents who attended live online services indicated they appreciated connecting, or reconnecting, to a spiritual community. However, three panelists mentioned connectivity problems, which they blamed more on the church than their own connection.

Here are some comments concerning online medical care and spiritual life:

- "It actually took away a lot of anxiety about going into the doctor's [office] during this time."

- "We had an issue for the video to appear so she could see [my son]."

- "I broke my ankle during the pandemic. I did a Zoom video with the orthopedic surgeon."

- "I managed to still be connected with the peers of the group and it was very helpful."

3. Impact of Distance Learning

One in three Arlington County residents surveyed (33%) have school-age children at home; all of these residents report that their children have been involved in school-based distance learning in recent months. Eighty percent of residents with children report they were given a tablet for school-based learning; the percentage leaps to 95% in the oversampled ZIP codes of 22203, 22204, and 22206. Ninety-two percent of Arlington County residents with children who report that their Internet is spotty say they were given a tablet for school-based distance learning. A tablet is useful especially if it means there are more devices to go around, but without improved connectivity it may be of limited use.

Though providing tablets was extremely helpful to thousands of parents countywide, many residents with children still needed to share digital devices with the children who have been learning online these last few months. Two in five Arlington County residents with children (42%) report they shared devices with their children for online learning purposes. A majority (54%) of Arlington County residents with children who share devices for online learning purposes experience connectivity problems.[4] As mentioned earlier in this report, households of three or more people are especially likely to be sharing devices and have children involved in school-based distance learning.

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[4] Directional findings, small sample size.

Figure 7: Distance learning problems related to sharing devices
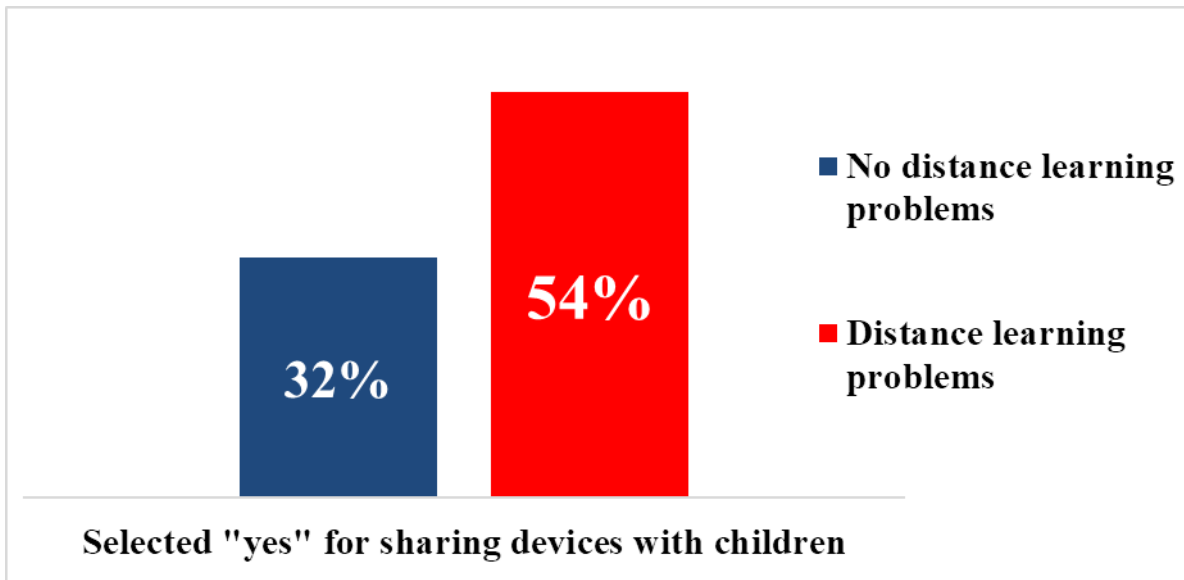
The focus group findings broadly echo what we measured in the countywide survey. Eleven panelists have children in school-based distance learning; all 11 have school-issued devices. While only one parent said connecting online was not easy on their end, several others mentioned connectivity problems they attributed to the teachers. In our three groups of speakers of languages other than English, we found limited understanding of school-based distance learning applications. We also heard this from several English-speaking parents. The parents said the schools needed to improve their communications on how to access distance learning platforms.

Similar to what we learned in the countywide survey, Arlington County families in the focus groups said they often experienced lack of bandwidth, especially those with two or more children attending school online. At times, this forced parents typically using the Internet for business during normal weekday school hours to go offline so that children could attend class.

Here are some comments concerning common connectivity problems faced by Arlington County residents with children living at home and in school-based distance learning:

- "At one point I had to download software on my phone, and we didn't have a lot of gigabytes."

- "I could not understand how to interact with my son's school, so we shared photos of his handwritten homework with his teacher."

- "Some families try to keep cost down. They try to use cellphone service to get Internet."

4. Potential Improvements in Arlington County

When asked what more Arlington County could do to improve digital equity, 11 of the 28 panelists, unprompted, said the County could offer more options for residents. Another eight said the County could provide reduced-price or free Wi-Fi.

Allowing Greater Choice

Eleven panelists specifically mentioned the words "competition" or "choices" when discussing ways to improve pricing and quality. Even panelists who were currently happy with pricing through the new Comcast Internet Essentials plan mentioned the need for more options in service.

Here are some comments concerning competition:

- "There is no competition. … The senior citizen is being held hostage because we have no choices."

- "We do not have a choice in my building. We have to use Comcast. I wouldn't use them, but it's not my choice."

- "I lived in Alexandria for a couple of years and you had a choice."

- "Technically we have Internet access, low-income property, but we have not very good Internet access, partly because of the provider. We don't have a choice."

Free Internet

All respondents earn either a low income or fixed income and felt Internet should be kept affordable for their income segment. Some believe Internet access should be a free commodity.

Here are some comments concerning free Internet:

- "If you are talking about digital equity for Arlington County, there is affordable housing that Arlington County is building. I would expect to have free Internet for everybody in that building."

- "In Singapore they have free Internet, so they call it a smart city. There are cities all over the world they call smart cities for offering the city free Internet."

- "County needs to talk to providers. We can't afford to buy anything else because Internet is so expensive."

- "I don't expect free services but would like preferred pricing without sudden increases to my bill."

5. First-Generation Communities' View of Internet Cost and Connectivity

We conducted one group with five Mongolian mothers and two groups with four Hispanic mothers total. These County residents are not affluent (as they fell under the designated income threshold for this study), nor do they describe themselves as Internet-savvy. The Mongolian immigrant family members we interviewed are paying higher prices (as high as $131 monthly) for Internet in large part to allow their children better connectivity for school purposes. These parents told us that they limit their own time on the Internet to allow children to take classes online. In our Spanish-language groups, three of the four participants told us that they did not have an Internet plan and connected through hot spots or on their phone.

Here are some comments, translated from Spanish, that represent the Spanish-language groups:

- "I have unlimited data on my phone, so I don't need Wi-Fi."

- "We are not good at technology and many Hispanic parents do not know the technology. It is difficult."

- "The price prevents me from getting it."

- "My son uses my hot spot to do his schoolwork. His school gave him a tablet. I cannot share my data, so he connects to my hot spot."

- "My children are savvy with computers and tablets. They find connection. It may be my hot spot, but it could be something else."

Within the Mongolian group, we heard more of the conflict of sharing limited bandwidth, with multiple children attending online classes. This group had not heard of the Internet Essentials program and stated that the prices they paid for Internet were on the high end of prices quoted in the focus groups.

- "Everybody is trying to connect to job, doing schoolwork, having to study, then some days it's very frustrating. I can't do my work."

- "We pay $131, which is the least expensive promotional price (includes Internet, cable TV, landline phone). It's going to be very expensive."

- "We can't afford to buy anything else because Internet is so expensive. But children need it."

- "We pay $80 and have the lowest-capacity Internet."

Figure 8: Words most commonly used by immigrant group participants

6. Financial Priorities

We heard often in focus groups and one-on-one interviews about the financial strain that the cost of Internet service placed on households. Rising economic difficulties due to COVID-19 will most likely drive demand for more affordable broadband service among Arlington County residents, especially given the current expectation to connect virtually for work, education, health care, and more, as a precaution. Beyond COVID-19, a broadband connection is rapidly becoming a necessity for every aspect of life.

In the countywide survey, we asked residents to rate their household bill-paying priorities — the three household bills they had to prioritize even if it meant not paying other bills. The choices were cable/Internet; cellphone; rent/mortgage; water; credit cards; grocery; and electricity. Rent/mortgage was ranked as the highest-priority household bill (63%) by most County residents. Electricity was the second-highest priority (28%), with another 20% who ranked electricity as their third-highest priority. Water (18%) and groceries (18%) were also common third-highest household bill priorities, with 13% of County residents naming cable/Internet. Credit card and cellphone were named as the household bills that get paid last or put off the longest.

7. Home Service Priorities: Quality vs. Price

Half of Arlington County residents surveyed (52%) say the most important thing with regard to home Internet service is that there is higher-quality broadband or Wi-Fi for better connections. Residents with spotty Internet (63%), those with children (60%), and those who pay less than $49 monthly for Internet (60%) are especially likely to say quality of broadband connection matters more than cost.

Another 1 in 4 (24%) say better pricing is more important for Internet given the ever-growing need to use the Internet more. Households of three or more people (32%) and those Arlington County residents who share devices (34%) are especially likely to choose better pricing.

In a focus group setting, the last question we asked panelists was, "Since the start of COVID-19 stay-at-home orders, what has become the most important to you regarding your home Internet service?" Among many of the digitally underserved and low-income Arlington County panelists, better pricing was most important.

In partial contrast, we heard almost identical stories from the 12 focus group panelists with school-age children: The adults working are at home, often using video applications, and their K-12 children are simultaneously attempting similar heavy-duty broadband demands for distance learning. Despite concerns about cost, especially among low-income parents and guardians, seven said improved quality broadband was most important.

Across all 28 panelists, when given a choice between better pricing; better quality broadband (defined by less buffering and the ability to have multiple devices logged on); better access (defined as a stable connection with less buffering); and more training, here's how the votes tallied:

- Better pricing   12

- Better quality broadband   9

- Better access   3

- More training   1

- Did not answer   3

In terms of choosing between quality and cost, here are some of the comments from the groups:

- "Price because I trust there will always be access."

- "If I don't have money to pay for it, the higher quality doesn't matter."

- "Before I got Essentials, I would have said provide low-cost Internet service."

RECOMMENDATIONS

1. Increase Options for Residents of Multi-Tenant Locations

Nearly half of the Arlington County residents we interviewed (47%) live in apartment buildings, duplexes, or garden apartments. Of the Arlington County residents interviewed in focus groups, 19 in 28 specifically mentioned living in multi-tenant apartment buildings that tend to be older and have spotty Internet coverage. In the focus groups, we commonly heard panelists say they

would like to have the choice of more than one provider and not be forced to buy service from a single provider. We heard across the groups that they bear the consequences of little or no Internet choice: higher prices and lower quality. We heard parents say they need to limit their use during school hours, which interferes with their ability to work or connect in other ways (e.g., for medical appointments, training). We heard older adults discuss limited plan options and the inability to get online during times of heavy usage, such as 4–6 p.m.

2. Create More Low-Income Programs

The connectivity problems experienced by a large minority (37%) of County residents and 50% of those with children living at home underscore the need for Internet connections to be as constant and dependable as electricity or water. On-demand high-speed connectivity has never mattered more than when work, job searches, and distance learning depend on sufficient bandwidth. This is especially true with those who live on fixed and low incomes.

Interest in the Comcast Internet Essentials plan among digitally underserved panelists suggests the need for it and perhaps similar programs that can exist beyond the COVID-19 pandemic — which could continue for many months or even years and has caused new economic difficulties for many Arlington County residents. Several panelists we spoke to are furloughed, are working reduced hours, or have been laid off.

Making affordable home Internet connections more available would serve thousands of Arlington County households as well as reduce dependency on mobile connections, something we learned was common among Hispanic focus group panelists in particular. In focus groups, half the participants told us they do not pay for Internet service, relying on phones and Wi-Fi hot spots. This focus group finding tracks with the countywide survey finding that 54% of Hispanic residents primarily use their cellphones to connect to the Internet.

Living on a restricted income also makes it harder to purchase larger-screen devices. Four of the six older adults we interviewed in focus groups said larger screens are essential to help them see but that only reduced costs would make such devices more attainable.

3. Become a "Smart" City Through Free Wi-Fi

To address digital equity issues, Arlington County may want to consider becoming a "smart" city — or, at least, a "smarter" city — by making more free Wi-Fi hot spots available through means such as outdoor Wi-Fi access points. This would especially benefit neighborhoods where affordable housing programs operate or where many older buildings have broadband capacity limitations. Building out an affordable wireless network in underserved neighborhoods could reduce inequities such as those found in ZIP codes 22203, 22204, and 22206, where low-income households, households of three or more people, and multi-generational households are more common than in the County as a whole. In the countywide survey, we learned that Wi-Fi challenges are more common in larger households.

Addressing digital equity issues is a unique opportunity for Arlington as it becomes an Amazon headquarters. Taking a smarter-city approach to distinguish Arlington County from other urban and suburban enclaves in the greater Washington metropolitan area likely creates advantages in future economic development situations, especially if some of the toughest competition is just across the river in places such as Bethesda and lower Montgomery County (as was the case with Amazon).

There is no set definition for a smart city, but the consensus includes electronic Internet sensors to collect data to manage and improve operations across the area. This data becomes the basis not only for improvements to municipal operations and businesses, but also for Internet cost reductions and free hot spots for households. Free Wi-Fi does not, on its own, make a city smart, but it is part of a larger vision to improve quality of life. A point of note: Singapore is consistently ranked the No. 1 smart city, and its Internet penetration was 82% in 2019. According to the last census numbers, 90% of the population had some type of Internet connection with 84% having a fixed home broadband connection.

4. Improve Capabilities in Older Buildings, Complexes, and Senior Centers

Older apartment buildings and complexes, some dating to the post-war period, primarily house residents 65 and older and low-income residents. In qualitative research, we often heard about how bandwidth is limited in old buildings that contain aging infrastructure or that were unintentionally designed in ways that create blind spots, such as those caused by high-rise building wings blocking reception in other parts of the same development or in adjacent properties. We also heard how often residential density in these buildings limits Internet use at certain times of the day. A digital equity strategy that is focused on older buildings, higher-density complexes, and senior residences could be another important piece of a "smarter" city strategy.

5. Expand Outreach Efforts to Non-English Communities

In focus groups with first-generation families, we found not only no awareness of low-cost Internet alternatives such as the Comcast Internet Essentials plan, but also less awareness than other audiences regarding connectivity issues and matters related to school-based distance learning. This lack of awareness creates yet another barrier for many first-generation parents, guardians, and children to overcome. We recommend better promotion of low-cost and free Internet service options within communities that speak languages other than English, as well as training or other assistance in using these services. In all three Non-English immigrant groups, the participants told us they were not savvy with technology and that their children were more proficient. Better training is needed within these communities, as well as better communications in the appropriate languages about how technology is being used in schools, the community, and at work. One mother who told us that "many Hispanic parents do not know the technology" said she would like to learn: "Someday I am considering taking a class to learn more about technology."