MEASURING MEASURABLE OBJECTIVES

HOW STATES WILL TRACK DIGITAL EQUITY PROGRESS

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INTRODUCTION

The Infrastructure Investment and Jobs Act's investment in broadband infrastructure and digital equity sets out an ambitious overarching goal: internet for all. States are responsible for developing and measuring the key performance indicators (KPIs) that can demonstrate tangible progress toward this goal, along five "measurable objectives" and for eight "covered populations" established in the law (see sidebar). Here we analyze digital equity plans to understand how states are defining these indicators, what existing data sources they are using, what new data they are collecting, and how they are using this information to guide their digital equity work. As states begin implementing their digital equity plans, understanding these metrics and methodologies will allow stakeholders to track the nation's progress toward universal broadband adoption.

KPIs can serve multiple functions including helping states craft concrete strategies to achieve their digital equity goals. States have taken drastically different approaches to their digital equity measurements. Some states have identified one or two high-level KPIs for each measurable objective, while others, like Indiana, have detailed numerous indicators, differentiating between output and outcome. Some states, like Illinois, have merged data collection with their broadband infrastructure work, collecting data simultaneously. States are using a range of federal datasets and administrative data from the programs they run as well as collecting data through surveys and focus groups to measure their KPIs. Some states are combining data to create indices. For instance, the Michigan High-Speed Internet Office has developed composite scores for each of the measurable objectives using data from the National Telecommunications and Information Administration's [Internet Use Survey](#) from November 2021.

Here is a look at how states plan to track their progress toward the measurable objectives, highlighting some distinctive approaches.

1. BROADBAND AVAILABILITY and AFFORDABILITY

States largely rely on federal data to estimate the availability and affordability of broadband services. Federal data is readily available in a consistent, timely fashion but can lack the detail and precision states need to help make decisions about implementing their digital equity plans.

Availability

For availability, most states use the Federal Communications Commission's Broadband Data Collection (BDC) to estimate the number of unserved and underserved households. However, the BDC data does not include demographic data and therefore cannot establish whether the needs of covered populations are being met. To connect broadband access to household demographics, some states, such as Maryland, turn to the U.S. Census Bureau's American Community Survey (ACS). The ACS asks residents about their wireline broadband services but does not include data on their connection speeds. ACS data can also be less reliable for smaller geographies.

Many states are supplementing federal data sources with their own representative surveys. Using that data, the California Department of Technology (CDT) is tracking the percentage of Californians who are connected to broadband internet service, disaggregated by covered population. The CDT is also asking its residents about internet reliability.

In addition to measuring home broadband connections, states are broadly tracking connectivity to community anchor institutions that are prioritized by the Broadband Equity, Access, and Deployment (BEAD) Program. A smaller subset of states (Hawaii and Iowa) is also measuring improvements in broadband availability by tracking the number of public Wi-Fi sites and Wi-Fi hotspots lent or provided to residents.

DISTINCTIVE APPROACHES

Georgia is the only state that plans to use the Microsoft Digital Equity Data Dashboard to track increases in broadband subscription rates (along with other indicators).

Missouri's Office of Broadband Development created a broadband vulnerability "footprint" tool, which combines ACS poverty and broadband data, along with data from the FCC. The footprint tool identifies "hotspots," defined as particular areas with varying degrees of need or gaps in data.

Affordability

On affordability, the overwhelming majority of states expected to use Affordable Connectivity Program (ACP) enrollment data to measure the affordability of broadband service. Alabama, Connecticut, Georgia, and Maine all set goals to increase the number of eligible households enrolled in the ACP before the program ended in May 2024. Some states, like Montana, planned to track ACP awareness among the covered populations to measure the effectiveness of their outreach. Anticipating that the ACP may not be receive renewed funding, some states, like Kansas, have included plans to track enrollment in any successor affordability programs, be they state or federal.

Many states, including Montana and Wyoming, are also tracking how many ISPs offer low-cost plans for eligible households. Because BEAD-funded ISPs are required to provide a low-cost option, the Montana Broadband Office plans to track the "percent uptake of affordable plans in BEAD-funded areas." The data for such measures will come from BEAD sub-recipient data. The Alaska Broadband Office will calculate the share of residents for whom "broadband is affordable," which they will calculate through a household survey about awareness of affordable broadband service options.

Some states are measuring affordability by asking people if they consider broadband too costly.

- The Idaho Commission for Libraries, for instance, will measure the number of Idahoans who say it is difficult to pay their monthly internet bill.

- As an alternative source of measurement, the Kansas Office of Broadband Development may use a statewide survey to evaluate prices for broadband paid by members of each covered population.

Very rarely are states identifying an explicit affordability threshold.

- The Utah Broadband Center defaults to an older FCC recommendation of 2 percent of a household's disposable income, noting that "no additional guidance has been forthcoming so the State Digital Equity Plan will continue to abide by this standard until a new one is published."

- The Maryland Office of Statewide Broadband identifies a dollar amount, using its phone survey to calculate the current average monthly cost of home internet for residents. The state aims to reduce that average from roughly $85 to $75.

- The Missouri Office of Broadband Development will calculate the percentage of households that are cost-burdened by high-speed internet expenses, where "cost-burdened" refers to spending more than 5 percent of household income on home internet expenses.

DISTINCTIVE APPROACHES

The Michigan High-Speed Internet Office (MIHI) has developed an "affordability score," which combines the percentage of households that do not use the internet at home because they cannot afford it with the percentage of households who temporarily lost their internet connection due to inability or difficulty paying for the subscription.

2. ONLINE ACCESSIBILITY of PUBLIC RESOURCES

Of all the measurable objectives, states have the widest range of understanding and measurement of online accessibility and inclusivity. Some states interpret "online accessibility and inclusivity" to mean providing government services online to all residents. Some are focused on specific covered populations, especially people with disabilities and/or people with language barriers. Measurement approaches include auditing websites, surveying residents, and using administrative data.

Among states that are focused on people's ability to use the internet to access government services, the Wyoming Broadband Office measures the percentage of state government services that are online. Taking a different approach to see how usable government services are from the perspective of residents, Illinois is tracking government website views.

Going a step further, some states—like Alabama, Delaware, and Georgia—are measuring whether their residents can effectively use the internet to access these government services. They are framing effective use in terms of residents' confidence, measuring the "percentage of all survey respondents who say they are very confident using the internet to access government services online." The states are able to disaggregate this metric by covered population and identify specific groups that may require more support.

According to the U.S. Department of Labor's Office of Disability Employment Policy, people with disabilities continued to have home internet access at lower rates, used the internet at lower rates, and more often cited cost as a barrier to home use, compared with people without disabilities. The NTIA developed a guide to digital inclusion activities for people with disabilities, including making government websites and services more accessible and providing people adaptive and assistive technology.

A number of states interpret online accessibility to focus on ensuring that people with disabilities are able to access government services.

- The Vermont Community Broadband Board will track the percentage of Vermonters with disabilities who report that they have what they need to productively use technology (e.g., assistive technologies) and that it works well.

- ConnectLA will conduct an accessibility audit and track the number of Louisiana state websites that fail such an audit.

- The Iowa Department of Management has identified standards such as Web Content Accessibility Guidelines (WCAG) and defined POUR principles of accessibility (Perceivable, Operable, Understandable, and Robust) that state agencies will aim to meet.

Some states are taking a more comprehensive view of barriers that hamper people's ability to access government services online. The Maine Connectivity Authority (MCA) identified a subset of covered populations—specifically, low-income individuals, veterans, people in reentry from incarceration, individuals with disabilities, and individuals with language barriers—as more likely to experience an intense barrier. The MCA will conduct user-focused accessibility audits of critical state resources used most by covered populations. The KPIs will include the results of these audits, as well as the level of confidence covered populations report in accessing government services online.

DISTINCTIVE APPROACHES

Minnesota's Office of Broadband Development has developed an accessibility metric that combines the percentage of county, city, and tribal government websites that:

- Meet state statutory accessibility requirements;

- Reflect a Flesch Readability Score of 90 to 100 (on a scale of 0 to 100, meaning very easy to read); and

- Provide translations of essential information in alignment with local linguistic diversity.

3. DIGITAL LITERACY

States are employing a variety of approaches to building the digital skills of their residents: digital navigator services that offer one-off tech support or tailor instruction, structured training and assessments, and a combination of both. Indicators and measurements are similarly varied.

States are using a range of output indicators to measure the amount and types of support they are providing.

- For instance, the Florida Office of Broadband will track the number of community anchor institutions offering digital navigator services.

- The Arizona Commerce Authority will similarly track the number of people assisted by digital navigator services.

- ConnectLA will track the number of individuals completing a digital skills training or program, disaggregated by covered population in Louisiana.

- Broadband Expansion and Accessibility of Mississippi (BEAM) will track the number of digital literacy and skills training programs (cybersecurity, telehealth, privacy, general skills, and more) and the number of Mississippians served by these programs.

States trying to measure whether residents have the skills they need to thrive in a digital society must consider a) what it means to be digitally literate and b) how to measure digital literacy.

To define digital literacy, states use terms like "core" (Arkansas), "basic" (Idaho), and "foundational" (Rhode Island) digital skills to refer to a minimum threshold. Some states are deferring on naming specific skills and planning to develop standards and curricula soon. The Pennsylvania Broadband Development Authority will establish a digital navigator blueprint to ensure a baseline standard of service. ARConnect will survey existing digital skills training services to develop its "core" digital skills training program in Arkansas.

A number of states have specified a range of skills in their baseline surveys that they plan to track over the course of their digital equity work. Figure 1 lists 10 of these states and the digital skills they have specified. Similar, potentially overlapping skills are listed separately. For instance, the table differentiates between "finding health information" and "accessing medical services and resources." While "accessing resources" may include informational resources, finding health information does not appear to encompass a telehealth visit with a provider.

Figure 1: DIGITAL SKILLS ACROSS 10 STATES

Enumerating Digital Skills Across States

	Alabama	Connecticut	Delaware	Georgia	Idaho	Maine	Maryland	Oregon	Rhode Island	Texas
Connecting a computer or smartphone to a Wi-Fi network										✓
Using email	✓	✓	✓	✓	✓	✓	✓	✓		
Sending an email with an attached image or document										✓
Using social media	✓	✓	✓	✓	✓	✓	✓	✓		
Participating in online video, voice or conference calls	✓	✓	✓	✓		✓	✓	✓		
Operating a small (home-based) business	✓	✓	✓	✓			✓	✓		
Working remotely and telecommuting	✓	✓	✓	✓			✓	✓		
Searching and applying for a job	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Searching for information online about jobs or healthcare										✓
Taking classes or participating in online job training	✓	✓	✓	✓	✓	✓	✓	✓		
Finding educational information						✓				
Completing homework or taking continuing education									✓	
Finding health information online					✓	✓				
Accessing medical services or resources	✓	✓	✓	✓			✓	✓	✓	
Shopping and paying bills online					✓					
Paying bills online										✓
Online shopping and consumer services	✓	✓	✓	✓			✓	✓	✓	
Accessing online financial services	✓	✓	✓	✓			✓	✓	✓	
Accessing governmental services	✓	✓	✓	✓			✓	✓	✓	
Making an appointment online, for example with the DMV										✓
Using a word processor, such as Google Docs or Microsoft Word, to create a document						✓				
Participating in users' local community									✓	
General internet searching									✓	
Transportation information									✓	
Downloading and installing a new app on a smartphone or tablet										✓
Protecting personal information/Finding tools to protect personal data					✓	✓				
Setting up protection against phishing and spam email										✓
Deleting cookies on a web browser										✓
Setting up parental controls or apps to block or monitor a child's access to some websites or applications										✓

Some states are looking to assessments and evaluations linked to training programs to measure digital skills.

- Maine and New Jersey point to Northstar, a widely used digital literacy resource that includes assessments and educational materials, as a potential model for digital literacy assessment.

- ARConnect will track the number of people who participate in or graduate from core digital skills training programs in Arkansas.

- The Rhode Island Commerce Corporation will track the number of highest-need, covered-population residents trained in digital skills programs for foundational skills.

A number of states will also use surveys asking respondents to assess their confidence in their digital skills.

- South Carolina and Massachusetts define digital skills confidence broadly, asking about people's confidence in their "ability to use the internet."

- Alabama, Connecticut, Delaware, Georgia, Maine, Maryland, and Oregon ask respondents to rate their confidence for each of the skills included in Figure 1. The responses are combined to arrive at the "average number of key digital skills performed by members of covered populations."

DISTINCTIVE APPROACHES

Arizona is incorporating digital skills training into its K-12 curricula. The Arizona Commerce Authority will establish a statewide Seal of Digital Literacy—similar to the Arizona Department of Education's Seal of Personal Finance—to recognize high school students who achieve a high level of proficiency in digital literacy. The seal will be placed on the student's diploma, and a note will be added to the student's transcript.

Illinois will track the percentage of schools offering technology training to the parents/caregivers of their students.

Most state plans do not specify indicators aimed at incarcerated individuals, although they are a covered population. Some states—like Kentucky, Maine, and Nebraska—do identify justice-involved individuals or people in reentry from incarceration as particular targets for digital skills training, including privacy and safety skills. The Nebraska Broadband Office will also track the number of facilities that allow incarcerated people to access employment websites. Idaho will track the number of digital skills certifications earned by incarcerated individuals during a three-year span.

Minnesota has established a unique approach. With the argument that "digital connection depends on human connection," KPIs are focused on people's experience of the state's digital equity work. Minnesota's Office of Broadband Development will use mapping data to determine the percentage of households located within a 60-minute round-trip drive or ride on public transit to a location that provides free basic digital skills and cybersecurity support.

4. ONLINE PRIVACY and CYBERSECURITY

Overwhelmingly, states understand privacy and security as a subset of digital skills. Their approaches to defining and measuring indicators follow a similar pattern—tracking activities and assessing residents' skills.

- North Dakota Information Technology will track the number of individuals completing a cybersecurity course.

- The Utah Broadband Center will develop a safety guide and track the distribution of this resource.

- The Tennessee Department of Economic and Community Development will track the number of people completing the cybersecurity training modules and their confidence in their knowledge of cybersecurity.

As part of a Marjorie & Charles Benton Opportunity Fund Fellowship, **Greta Byrum developed recommendations** for how state offices can mitigate the potential harms of an increasingly digital life, including measures for program design and administration. Byrum also makes a case for recognizing the pervasive and structural nature of the threats and shifting toward collective solutions.

As with other skills, states are using surveys to gauge residents' views on their safety and privacy online. South Carolina's Digital Opportunity Department is calculating the share of the surveyed population that "does not feel safe using the internet." The Oklahoma Broadband Office tracks the percentage of people who say the internet is too complicated.

Alabama, Connecticut, Delaware, Georgia, Maryland, and Oregon include privacy and safety in their delineations of core digital skills. They ask residents about their level of agreement with the following statements:

- I can use and adjust privacy settings on social media.

- I can identify false or misleading information.

- I can recognize and avoid online fraud (or phishing schemes).

While self-efficacy can be a useful measure, especially when a lack of confidence can deter people from using the internet, people also do not know what they do not know. Relying on self-reporting about people's level of skill in dealing with privacy and safety online runs the risk of underestimating the threat.

Massachusetts also uses a survey to gauge privacy and safety but asks not about skills but people's perception of vulnerability. For instance, the Massachusetts Broadband Institute (MBI) surveyed residents about how concerned they are about internet safety. The related KPI is the share of residents concerned about internet safety. Follow-up questions ask what those concerns are and if residents are aware of resources that can help. The data from those questions can help the MBI understand people's safety and privacy needs and respond accordingly. As with measures of self-efficacy, people's perceptions of threats may also be inaccurate.

Texas's online survey asks respondents about a concrete practice, namely whether people have installed "cyber security measures (such as ad blockers, virus scanning software, etc.)" on their desktop, laptop, or tablet. Based on these responses, the Texas Broadband Development Office will calculate the percentage of Texans who have cybersecurity and online privacy measures set up on their devices, including Texans belonging to covered populations. The breadth of the question does not allow the Texas Broadband Development Office to analyze what specific actions residents are taking and what kinds of threats they may be prepared for as a result.

DISTINCTIVE APPROACHES

Pennsylvania's digital equity plan goes into some detail about the potential threats to online safety and security, from routine digital hygiene practices that protect people's personally identifiable information to protecting users' mental health and self-esteem. Pennsylvania also cites federal data from the Federal Trade Commission about the number of online scam reports by residents, as well as other research about the mental-health harms of social media to establish an independent measure of the threat. The Pennsylvania Broadband Development Authority has identified other state agencies with whom it can partner to integrate online safety and well-being support in work with covered populations. The Broadband Development Authority will work with the Pennsylvania Department of Banking and Securities to track the number of financial security trainings delivered to covered populations, aiming to increase it by 10 percent in 2025.

5. CONSUMER DEVICES

Measuring device access is more complicated than it may appear, going beyond whether a resident has a device or not. States may also consider whether residents own a device or share it. How many devices does a person or household need? Should devices meet minimum standards? Can residents maintain these devices?

States have developed a variety of measures to track these dimensions of device access.

- The Tennessee Department of Economic and Community Development will track the number of no- to low-cost devices provided to members of covered populations.

- The Georgia Technology Authority will track the number of community anchor institutions that have device loaner programs.

- North Dakota Information Technology will track the number of libraries offering public devices.

- The Arizona Commerce Authority will track the number of local centers for device lending, purchasing, and earning (locations that provide a learning opportunity that culminates in a learner getting a device to keep).

A number of states rely on the ACS for device data. Kansas, Louisiana, Minnesota, and North Carolina all use the ACS to calculate the percentage of each covered population with a broadband-enabled device. However, **the ACS** question on devices asks whether any member of the household has or uses the device; therefore, these numbers can present an inflated assessment of device access.

States, including Kansas, are supplementing ACS data with survey data. The Kansas Office of Broadband Development will calculate the percentage of covered-populations statewide survey respondents reporting ownership of or access to affordable devices. It does not count tablets or smartphones in this measure because these devices do not provide the full digital experience allowed by personal computing devices. Oregon will measure the percentage of all survey respondents who report that they use at least one laptop or desktop computer at home.

In order to ensure that the devices are adequate for residents' needs, both Kansas and Oregon ask specifically about laptops and desktops. The Oklahoma Broadband Office will use surveys to measure the percentage of Oklahomans with "access to a high-quality device" in their home. Many states—including California, Colorado, Missouri, and Texas—are emphasizing reducing smartphone dependence. The Missouri Office of Broadband Development, for instance, will track the percentage of households reporting use of a personal computer at home, aiming to go from 78 percent in 2023 to 85 percent by 2028.

The office will also track the percentage of smartphone-only households, aiming to reduce that figure by half by 2028.

Some states are interested in the number of devices residents can access as a way to ensure that digital needs are met. The Hawaii Broadband & Digital Equity Office will track the percentage of households with enough devices for each member. Among covered populations, the Montana Broadband Office will use a phone survey to calculate the percentage of people who can afford and use at least two devices (among desktops/laptops, tablets, and smartphones/cell phones) to connect to the internet at home or somewhere else.

In order to understand whether devices are affordable, states are measuring the robustness of the ecosystem that provides free or low-cost devices. The Colorado Broadband Office will track the number of Colorado-based refurbishers providing low-cost devices to individuals. The Maine Connectivity Authority (MCA) will measure the number of devices donated by businesses, institutions, and agencies to be refurbished. The MCA will also provide technical support along with all the distributed devices.

States plan to measure the level of tech support residents can access and track the amount of tech support they provide through digital equity work. New York's ConnectALL Office will track New Yorkers reporting challenges maintaining or troubleshooting their own devices.

States—including Alabama, Delaware, Maryland, New Mexico, and Oregon—use surveys to ask how long it would take respondents to replace their primary device if it were lost or damaged. These states will track the percentage of all covered-population survey respondents who report that they can get a broken or lost computing device fixed or replaced within a week. North Carolina's Department of Information Technology will track the number of technical support services that are free or considered very/somewhat affordable.

DISTINCTIVE APPROACHES

Although local statutes, security concerns, and varying regulations governing different correctional facilities all impact whether incarcerated individuals have access to devices, a small number of states have developed device metrics for incarcerated individuals.

- The Vermont Community Broadband Board will measure the cost of device rentals and computer time for incarcerated individuals, as well as the utilization rate of these devices.

- Connecticut's Commission for Educational Technology will track the number of residents who have access to a 1:1 device (a device per person) in a state correctional facility.

- The Nebraska Broadband Office will calculate the percentage of incarcerated individuals with access to a digital device while incarcerated.

The Michigan High-Speed Internet Office (MIHI) has developed a device distress score to highlight the needs of covered populations. Using the NTIA Internet Use Survey data, the score combines the percentages of each of the covered populations that do not have a desktop or laptop computer and the percentages of each of the covered populations that were unable to use a computer for one or more days because someone else was using it. MIHI will use the device distress score to guide its activities, recognizing that Michiganders will need access to devices before they benefit from any other online services.

These key performance indicators can demonstrate progress toward the Digital Equity Act's five measurable objectives—Broadband Availability and Affordability, Online Accessibility of Public Resources, Digital Literacy, Online Privacy and Cybersecurity, and Availability of Consumer Devices.

This analysis is part of a larger research project, supported by AARP, aimed at helping state broadband offices measure digital equity in their states, particularly for covered populations and older adults.

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