BEAD Five-Year Action Plan

State of Montana

Montana Broadband Office

Montana Department of Administration

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1 Executive Summary

The Montana Broadband Office's vision is to narrow the digital divide in support of Montana's economic, workforce, health, and educational goals by ensuring reliable, affordable internet access for everyone in the state. Montana aims to increase broadband access and adoption by pairing broadband deployment with digital opportunity efforts. Given the potential high cost associated with deploying fiber infrastructure to remote areas of Montana, the Montana Broadband Office will, by necessity, explore a flexible combination of fiber optic cable, fixed wireless, and satellite deployment to achieve its internet connectivity goals. As the NOFO states, the Five-Year Action Plan (FYAP) is Step 3 of the 9 steps listed in the BEAD Program's structure, including the Initial Proposal as well as the Final Proposal and Release of Remaining Funds. The FYAP is thus intended to help Montana establish its broadband goals and priorities and serve as a comprehensive needs assessment that will inform the Initial Proposal.

Montana's first aim in broadband deployment as part of the BEAD Program is to reach unserved locations – defined as those without any broadband service at all or with broadband service offering speeds below 25 megabits per second (Mbps) downstream/3 Mbps upstream. Montana will strive to provide 100/20 Mbps service to as many locations as possible, with the ultimate goal of scaling to 100/100 Mbps high speed internet service. Montana's second aim is developing programs and partnerships that address core factors impacting digital participation for Montanans. In line with those aims, Montana has developed six goals and ten objectives covering broadband deployment, access, adoption, affordability, digital opportunity, and economic growth and job creation (Section 2).

Of the state's 487,684 Broadband Serviceable Locations ("locations" hereafter), 63,438 are unserved and 23,974 are underserved (Section 3.4). In reaching all these locations, Montana faces unique topographical challenges in deployment, given the state's vastness and population density. This FYAP lays out Montana's perspective on the state's broadband needs (Section 3.4), and outlines the tools at the state's disposal for achieving widespread broadband access (Sections 3.1-3.3). It also sketches out potential approaches for mitigating the barriers the state anticipates (Section 4).

Based on the needs and gaps identified, Montana has developed an Implementation Plan for broadband deployment that is founded on two premises: first, that the FYAP is the first step on a journey to deliver broadband to all Montanans, and second, that the FYAP is an instrument for gathering input from stakeholders as well as from the NTIA. To that end, Section 5, the implementation plan, outlines a plan for engaging key stakeholders, priority activities and strategies for the State of Montana, and several potential broadband deployment scenarios. The FYAP has been developed with the input of a range of stakeholders and partner departments across state government. The deployment scenarios offered here are intended to give stakeholders an opportunity to provide substantive input on which scenario may best serve Montanans.

Montana considers that broadband deployment will only be effective in combination with a digital opportunity strategy that guides the state's efforts to narrow the digital divide and provide all Montanans with affordable high-speed broadband, adequate access to devices, and the digital literacy skills to meaningfully use the internet and its many services. To that end, this FYAP has been developed in tandem with the Digital Opportunity Plan, and community,

government, and industry stakeholders across the state have been consulted about both plans in tandem. Montana is confident that this Five-Year Action Plan and associated stakeholder engagement process will benefit all Montanans by informing the deployment of broadband across the state toward achieving a future connected Montana.

2 Overview of the Five-Year Action Plan

2.1 Vision

This section answers the question: what is Montana's vision for broadband deployment?

The Montana Broadband Office's vision is to narrow the digital divide in support of Montana's economic, workforce, health, and educational goals by ensuring reliable, affordable internet access for all Montanans. Montana will increase broadband access and adoption by pairing broadband deployment with digital opportunity efforts. Given the potentially high cost associated with deploying fiber infrastructure to remote areas of the state, the Montana Broadband Office will, by necessity, explore all technology options to achieve its internet connectivity goals. Such technologies may include drawing on a flexible combination of fiber optic cable, fixed wireless, and satellite deployment to reach homes, businesses, and Community Anchor Institutions (CAIs) such as schools and hospitals. This broadband deployment plan will give all Montanans the internet access they need for full participation in our society, democracy and economy.

Montana's core aims for broadband deployment are twofold. First, the state aims to build out broadband to all unserved locations (recognizing the unique challenges of doing so in a topographically varied state with a significant rural population) and reach as many underserved locations as possible. Second, Montana aims to prioritize digital opportunity in its approach, factoring in affordability, access to devices, and the digital skills required to help close the internet adoption gap across the various covered populations.[1] Together, these two aims will shape a program that gives all Montana residents the internet access needed for full participation in society.

Montana's first aim in broadband deployment as part of the BEAD Program is to reach unserved locations. Montana will strive to provide 100/20 Mbps service to as many locations as possible,

[1] Within the parameters of the BEAD Program, Covered Populations include the following:
1. Individuals who live in covered households, the income of which for the most recently completed year is not more than 150 percent of an amount equal to the poverty level, as determined by using criteria of poverty established by the Bureau of the Census
2. Aging individuals
3. Incarcerated individuals, other than individuals who are incarcerated in a Federal correctional facility
4. Veterans
5. Individuals with disabilities
6. Individuals with a language barrier, including individuals who—
    a. Are English learners; and
    b. Have low levels of literacy
7. Individuals who are members of a racial or ethnic minority group; and
8. Individuals who primarily reside in a rural area.

with the ultimate goal of scaling to 100/100 Mbps high-speed internet service. However, broadband deployment to more rural locations will present unique challenges. As the nation's fourth largest state with a land area of 145,550 square miles and 44th in population, Montana has a population density of 7.4 people per square mile.[2] The topography of the state's two distinct geographic regions (Great Plains and Rocky Mountain Region) drive the state's connectivity challenges. In light of this potentially significant cost barrier, Montana plans to use available resources to accelerate the state's high-speed internet expansion to its constituents. In this Five-Year Action Plan, the state outlines its plan to use funds to reach unserved and underserved locations with high-speed internet in the most high-impact and cost-effective way possible.

Montana's second aim in broadband deployment is developing programs and partnerships that address core factors impacting digital participation for Montanans. Searching for and responding to a job ad, communicating with a child's teacher, and paying a bill are all examples of interactions that are often easily executed online. Rural communities, which represent ~61 percent of Montana's population, are further removed from access to in-person services and are also less likely to have sufficient internet access, potentially keeping them cut off from basic services and information.[3] Montana has made it a priority to offer electronic options for accessing government services via eGovernment, one of the State of Montana's information technology goals and major strategic initiatives, through which 62 different state agencies, organizations, universities, and local governments offer more than 400 online services to benefit Montana's citizens.[4] Broadband deployment will further the state's IT Strategic Goals[5] and workforce, educational, healthcare, and economic goals.

The Montana Broadband Office (MBO), located within the State of Montana's Department of Administration (DOA), has the mandate to act as the administering entity for the state's broadband infrastructure deployment program, ensuring broadband access, adoption, and implementation for all populations.[6] The Montana Broadband Office (MBO) is therefore building a broadband program that will reach unserved and underserved locations and narrow the digital divide, giving all Montana residents the information technology capacity needed for full participation in today's society, democracy, and economy.

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[2] United States Census Bureau estimates as of 01 July 2021: Land area and Population https://www.census.gov/quickfacts/MT

[3] United States Census Bureau. Digital Opportunity Act Population Viewer, https://mtgis-portal.geo.census.gov/arcgis/apps/MapSeries/index.html?appid=a0013a9dcbb9419e855f563d78e892ef

[4] Montana's eGovernment Initiative, https://sitsd.mt.gov/services-support/egovernment-services-initiative/

[5] State of Montana IT Strategic Plans, https://sitsd.mt.gov/governance/it-plans/#:~:text=The%20State%20of%20Montana%20remains,and%20the%20State's%20information%20assets

[6] ConnectMT; Montana House Bill 632 https://connectmt.mt.gov/ https://leg.mt.gov/bills/2021/billpdf/HB0632.pdf

2.2 Goals and Objectives

This section answers the question: what are Montana's goals for broadband deployment and digital opportunity?

The goals and objectives included here will inform the BEAD Initial and Final Proposals. Montana will partner with local governments and departments such as the Department of Public Health and Human Services, the Office of Public Instruction, the Montana Department of Labor and Industry, the State Library, and many other state government agencies and departments to achieve these goals. Montana will also be working with Internet Service Providers (ISPs) and other organizations to deploy broadband in a way that furthers digital opportunity.

All numerical goals outlined below will be informed by the feedback from stakeholders and the NTIA, as well as the deployment scenarios chosen. The State has six goals and ten objectives across the following six areas: broadband deployment, broadband access, broadband adoption, broadband affordability, digital opportunity, and economic growth.

2.2.1 Broadband Deployment

The state's goal for broadband deployment is to use federal funding efficiently and effectively to develop and implement lasting broadband infrastructure for a future-connected Montana. Objectives in this category focus on the timely and cost-effective delivery of physical broadband infrastructure to locations across the state:

(1) Build out broadband infrastructure to x locations by 2030 at the cost of z

Exhibit 1: Broadband Deployment Goals and Objectives

Objective #	KPI	Baseline	Goal
1a	# locations served as part of BEAD	0	TBD
1b	Cost	$0	Full and efficient use of BEAD allocation

2.2.2 Broadband Access

The state's goal for broadband access is to ensure all Montana residents have access to the internet and to the necessary devices in their homes, schools, libraries, and businesses. Objectives in this category focus on building out broadband to more locations and making it possible for Montanans to access the internet more easily and reliably. The state has three objectives related to broadband access:

(2) Decrease the percentage of unserved locations
(3) Decrease the percentage of underserved locations
(4) Increase the percentage of Montana residents with access to internet-capable devices

Exhibit 2: Broadband Access Goals and Objectives

Objective #	KPI	Baseline	Goal
2	Percent of locations unserved	13%	0% (as required by NOFO)
3	Percent of locations underserved	5%	TBD
4	Percent of residents with internet-capable device access (e.g., laptop, smartphone, tablet)	91.8%	TBD

2.2.3 Broadband Adoption

The state aims to further broadband adoption through programs and partnerships with community stakeholders. The state has one objective related to broadband adoption:

(5) Increase household adoption rates

Exhibit 3: Broadband Adoption Goals and Objectives

Objective #	KPI	Baseline	Long-term goal
5	Household adoption rate	67%	TBD

2.2.4 Broadband Affordability

The state plans to leverage existing programs to ensure that cost is not a barrier to accessing broadband for all Montanans, irrespective of their income level. Objectives in this category ensure that more residents can access internet services, and that the internet is more affordable for them. The state has two objectives related to broadband affordability:

(6) Increase the percentage of eligible households enrolled in the Affordable Connectivity Program (ACP)
(7) Increase the percentage uptake of affordable plans

Exhibit 4: Broadband Affordability Goals and Objectives

Objective #	KPI	Baseline	Goal
6	Percent of eligible households enrolled in ACP	21%	TBD
7	Percent uptake of affordable plans[7]	N/A	TBD

[7] The definition of affordable plans will be determined by MBO.

2.2.5 Digital Opportunity

Montana's goal for digital opportunity is to reduce the digital divide among all Montana residents by increasing high-speed internet adoption among covered populations:

(8) Increase household adoption rates within covered populations
   a. Adoption rate among the rural population
   b. Adoption rate among the Black population
   c. Adoption rate among the Native American population
   d. Adoption rate among the aging population
   e. Adoption rate among the veteran population
   f. Adoption rate among the population with disabilities[8]
   g. Adoption rate among households who make less than $20k

Exhibit 5: Digital Opportunity Goals and Objectives

Objective #	KPI	Baseline	Goal
8a	Adoption rate among the rural population	TBD	TBD
8b	Adoption rate among the Black population	63%	TBD
8c	Adoption rate among the Native American population	53%	TBD
8d	Adoption rate among the aging population	58%	TBD
8e	Adoption rate among the veteran population	64%	TBD
8f	Adoption rate among the population with disabilities	55%	TBD
8g	Adoption rate among households who earn less than $20K annually	65%	TBD

2.2.6 Economic Growth and Job Creation

Montana's goal for economic growth and job creation is to bolster the economic competitiveness of Montana by ensuring widespread access to high-speed internet. While Montana holds that increased broadband deployment will ultimately benefit the state's economy across the board, Montana has a special interest in ensuring that businesses have the internet connectivity they need to succeed. Montana thus has one objective related to economic growth and job creation:

[8] Broadband access via cable, fiber, DSL per the U.S. Census Bureau, American Communities Survey (ACS), 2021 5-year estimates; includes DC; https://data.census.gov/table?q=internet&g=040XX00US30&tid=ACSST5Y2021.S2801

(9) Increase the percentage of business locations with high-speed internet access

Exhibit 6: Economic Growth and Job Creation Goals and Objectives

Objective #	KPI	Baseline	Goal
9	Percent of business locations with high-speed internet access	77%	TBD

To ensure progress toward achieving the goals and objectives outlined above, the Montana Broadband Office has developed a tracking mechanism for each of the above KPIs. These KPIs will be updated regularly to ensure the overall program goals are being met and to help identify and address any risks that may arise. The table below identifies the data source that will be used for tracking each KPI, the frequency of updating, and who will be responsible for tracking:

Exhibit 7: Goals and Objectives KPIs

Objective #	KPI	Data Source	Tracking Frequency	Entity Responsible
1a	Number of locations served as part of BEAD	ISP submissions	Every 6 months	Chief Data Officer
1b	Cost	Program data	Every month	Grant Accountant
2	Percent of locations unserved	Broadband map	Every 6 months	Chief Data Officer
3	Percent of locations underserved	Broadband map	Every 6 months	Chief Data Officer
4	Percent of residents with internet-capable device access	US Census data	Every 12 months	Census and Economic Information Center
5	Household adoption rate	US Census data	Every 12 months	Census and Economic Information center
6	Percent of eligible households enrolled in ACP	USAC data	Every 6 months	Program Coordinator
7	Percent uptake of affordable plans	ISP submissions	Every 6 months	Program Coordinator
8	Adoption rates among Covered populations	US Census data	Every 12 months	Census and Economic Information center
9	Percent of business locations with high-speed internet access	Broadband map	Every 6 months	Chief Data Officer

3 Current State of Broadband and Digital Opportunity

3.1 Existing Programs

This section answers the questions: what are the existing activities, and who are the employees and contractors of Montana's Broadband Office; what are the funding sources available to it?

Montana's Broadband Office (MBO) was created in 2021 by Senate Bill 297 and House Bill 632. Senate Bill 297 (the ConnectMT Act) created the state's broadband infrastructure deployment program; House Bill 632 appropriated $270 million in American Rescue Plan Act (ARPA) funds for state broadband grants (comprising $150.1M of 602 SLFRF and $119.9M of 604 CPF funds), which the MBO administers.

Senate Bill 297 provides that Montana "shall establish the broadband infrastructure deployment program and shall administer and act as the fiscal agent for the program and is responsible for receiving and reviewing responsive proposals and awarding contracts after review and receiving the governor's approval."[9] In service of these aims, the MBO, including a Program Manager with support from a dedicated Broadband Coordinator and Grant Accountant, has led the development of program processes and the application/challenge structure for the state's ARPA broadband funding process and will do the same for the state's BEAD program. Montana's BEAD program thus takes into account the work that has been funded via ARPA as well as learnings from the ARPA process while being aligned to BEAD guidelines.

During the 68th legislative session (i.e., LC 1234), Senate Bill 531 defined the role of the Communications Advisory Commission in supporting broadband efforts in the state and aligned Montana's broadband service availability definitions and funding guidelines to BEAD requirements.[10] Also, during the 68th legislative session, a shift of $44,148,748 of 602 funds to the ConnectMT program was passed by an appropriation change.[11] Total funding for grant awards is anticipated to increase from $266M to approximately $310M, but the timing of this funding is to be determined.

The BEAD Program targets the following types of locations, defined in the Notice of Funding Opportunity (NOFO):

> **Unserved Location**: a broadband-serviceable location that the Broadband DATA Maps show as (a) having no access to broadband service or (b) lacking access to reliable broadband service offered with: (i) a speed of not less than 25 Mbps for downloads; and (ii) a speed of not less than three Mbps for uploads; and (iii) latency less than or equal to

[9] Montana Senate Bill 297, https://leg.mt.gov/bills/2021/billpdf/SB0297.pdf
[10] Montana Senate Bill 531. https://leg.mt.gov/bills/2023/billpdf/SB0531.pdf
[11] ConnectMT Broadband Resources. Funding. https://connectmt.mt.gov/ARPA/Funding

100 milliseconds. Unserved locations include "Frontier Areas," defined as areas with no or extremely limited terrestrial broadband service.

Underserved location: a broadband-serviceable location that is (a) not an unserved location, and (b) that the Broadband DATA Maps show as lacking access to reliable broadband service offered with: (i) a speed of not less than 100 Mbps for downloads; and (ii) a speed of not less than 20 Mbps for uploads; and (iii) latency less than or equal to 100 milliseconds.

Activities being conducted by the Montana Broadband Office are further detailed in Exhibit 8**Exhibit *1*** below.

Exhibit 8: Current Activities that the Broadband Program/Office Conducts

Activity Name	Description	Intended Outcome(s)
Stakeholder Engagement with the public (all engagement with stakeholders is further detailed below in Section 5.1: Stakeholder Engagement Process)	Montana's Broadband Office (MBO) hosts meetings open to the public to discuss progress on broadband goals, including meetings regarding funds disbursed under ARPA. MBO also conducts public meetings across the state to collect input for the BEAD planning process.	A transparent view of progress on broadband project implementation and deployment is available to Montana residents. All residents also have opportunities to provide input into the broadband program and BEAD planning process.
Stakeholder Engagement with ISPs	MBO hosts focus groups and one-on-one sessions to collect input from ISPs on the BEAD planning process	A transparent view of the grantmaking process and opportunity to provide input into the broadband program and BEAD planning process is available to ISPs
Stakeholder Engagement with targeted constituent groups and Covered Populations	Montana's Broadband Office (MBO) hosts meetings with targeted constituent groups, such as higher education institutions, chambers of commerce, schools, hospitals, and organizations supporting Covered populations	Targeted constituent groups have an opportunity to provide input into the broadband program and BEAD planning process
Stakeholder Engagement with Tribal Groups	Montana's Broadband Office (MBO) engages regularly with Tribal Groups and also conducted a formal consultation process to collect input that will	Tribal groups have an opportunity to provide input into the broadband program and BEAD planning process

Activity Name	Description	Intended Outcome(s)
	inform the BEAD planning process	
Agency coordination	MBO regularly coordinates across state agencies to align on broadband implementation goals and strategies	The coordination efforts help to remove roadblocks to broadband implementation and ensure the broadband strategy is working to achieve the broader goals for the State of Montana
Technical support for ISPs	MBO provides hands-on technical assistance to the state's telecommunications community with support from the ARPA and IIJA Engineering and Grant Review Lead Contractor	Telecommunications providers benefit from the state's and contractor's expertise
Development of state broadband map	MBO is in the process of developing a state broadband map. A location-level fabric has been acquired through a contractor and ISP data has been collected to determine service availability. Updates to the service availability map are conducted every six months.	The broadband map on which allocations from American Rescue Plan Act funding decisions are based is regularly maintained to accurately reflect unserved and underserved locations. This data will help supplement the broadband data that will be provided by the FCC to ensure the most comprehensive view of unserved and underserved areas in Montana
Development of broadband program parameters, criteria, format	MBO developed the parameters and criteria for ISPs to receive broadband funding allocated from the American Rescue Plan Act.	Applicants have a clear view of funding application requirements and criteria. Lessons learned will be carried forward to the BEAD/Digital Opportunity programs
Technical review of proposed unserved and underserved project areas	MBO conducts field site visits as well as a technical review of unserved and underserved project areas that are most impacted by the pandemic with engineering support from the	MBO is able to determine technical feasibility and need of proposed project areas. Information collected will also help inform the BEAD planning process

Activity Name	Description	Intended Outcome(s)
	ARPA and IIJA Engineering and Grant Review Lead Contractor	
Administration of broadband grant application process	MBO collected grant applications for funding that was allocated from the American Rescue Plan Act and administers the full application process, including responses to any questions, the collection of applications, the issuance of challenge notifications, and facilitation of any revise and resubmit responses	MBO collected information from applicants, enabling it to make funding decisions that will enable the implementation of lasting broadband infrastructure. Lessons learned will be carried forward to the BEAD program
Review of broadband grant applications	MBO reviewed and scored applications for funding from American Rescue Plan Act allocations and made award recommendations	The funding decisions will support implementation of lasting broadband infrastructure. Lessons learned will be carried forward to the BEAD program
Broadband grant disbursement	MBO is developing the necessary grant disbursement processes and will disburse broadband grants from American Rescue Plan Act allocations to successful applicants	ISPs awarded broadband grants will receive funds enabling efficient broadband deployment. Lessons learned will be carried forward to the BEAD program
Broadband grant management	MBO is developing grant management policies and processes to govern the administration of broadband funding from American Rescue Plan Act allocations, including auditing and financial compliance, technical assistance, and performance management	MBO's grant management process will ensure broadband funding is implemented efficiently and effectively, and any implementation risks are addressed promptly. Lessons learned will be carried forward to the BEAD program

Exhibit 9: Current and Planned Full-Time and Part-Time Employees

Current/ Planned	Full-Time/ Part-time	Position	Description of Role
Current	Part-time	Director of Administration/	Oversee all aspects of the day-to-day

Current/ Planned	Full-Time/ Part-time	Position	Description of Role
		Broadband Manager	operations for the ConnectMT program and other broadband activities
Current	Part-time	Chief Legal Counsel	Handle day-to-day activities for the broadband program including drafting contracts, reviewing state and federal law and all federal guidance, and providing additional legal support
Current	Part-time	Attorney	Handle day-to-day legal activities, participate in and lead the state's efforts legally during the drafting and submission of the state's BEAD plan
Current	Part-time	Administrator for Architecture and Engineering	Work with state and third-party engineers to conduct field site visits and assist in the identification of barriers to reaching Montana's most remote and geographically challenging areas
Planned	Part-time	Chief Data Officer	Initiate data surveys to capture information on our key digital opportunity gaps, led efforts on establishing the broadband map to support the ConnectMT program
Current	Full-time	Broadband Administrative Assistant / Coordinator	Coordinate meetings internally and with external stakeholders, arrange travel, update the ConnectMT website with relevant materials, draft presentations and marketing materials, and field customer inquiries
Current	Part-time	Business Analyst	Organize work streams, create a work plan for our internal team and external consultants, assist with data analytics
Current	Part-time	Grant Accountant	Compile and analyze financial data, create reports, maintain accurate records, and present to the ConnectMT team

Current/ Planned	Full-Time/ Part-time	Position	Description of Role
Current	Part-time	Budget Specialist	Tracks and projects all spending for the entire broadband program
Planned	Full-time	Grant Coordinator	Coordinate grantmaking process and grant management activities

Exhibit 10: Current and Planned Contractor Support[12]

Current/ Planned	Time	Position	Description of Role
Current	Full-time	ARPA and IIJA Engineering and Grant Review Lead	Oversee ARPA and IIJA Engineering and Grant Review process
Current	Full-time	Broadband Mapping Program Lead	Oversee broadband mapping process
Current	Full-time	Broadband Planning Lead	Analyze current broadband access, adoption, and digital opportunity data and incorporate stakeholder inputs to develop the BEAD Action Plan and Digital Opportunity Plan
Current	Full-time	IIJA Outreach and Stakeholder Engagement Lead	Oversee stakeholder engagement process for IIJA outreach
Current	Full-time	ARPA Financial Compliance Lead	Direct process ensuring ARPA Financial Compliance

Exhibit 11: Broadband Funding

Source	Purpose	Total	Expended	Available
FCC Rural Development Opportunity Fund Phase 1	Deployment of high speed fixed broadband service to rural homes and small businesses that lack it	$53,092,194	TBD	TBD
USDA ReConnect Round 3	Construction, improvement, or acquisition of facilities	$56,068,893	TBD	TBD

[12] Note: Contractor support may continue to evolve as the BEAD program progresses

Source	Purpose	Total	Expended	Available
	and equipment needed to provide broadband service in eligible rural areas			
USDA ReConnect Round 2	Construction, improvement, or acquisition of facilities and equipment needed to provide broadband service in eligible rural areas	$17,849,797	TBD	TBD
USDA ReConnect Round 1	Construction, improvement, or acquisition of facilities and equipment needed to provide broadband service in eligible rural areas	$3,358,434	TBD	TBD
Treasury ARPA – State and Local Fiscal Recovery Funds	Address the economic fallout of the pandemic by meeting local needs, including necessary investments in broadband infrastructure	$155,065,467	$1,785,978	153,279,489
Treasury ARPA - Capital Projects Fund	Fund reliable, affordable broadband infrastructure and other digital connectivity technology projects	$119,934,533	0	$119,934,533
Treasury ARPA – Additional allocation	Additional allocation for funding to support investments in broadband infrastructure under the ConnectMT program	$44,148,748	0	$44,148,748
Treasury ARPA – Emergency Connectivity Fund	Help schools and libraries support remote learning	$853,554	TBD	TBD

Source	Purpose	Total	Expended	Available
State Digital Opportunity Capacity Grant Program	Provides funding for states to develop and implement State Digital Opportunity Plans and digital inclusion plans activities	$601,301	$0	$601,301
BEAD Planning Funds	Provides funding for planning and pre-deployment activities	$5,000,000	TBD	TBD

Note:
Some funding was also available to tribes via the Tribal Broadband Connectivity Program, the purpose of which is to expand access to and adoption of broadband service on Tribal Lands or programs that promote the use of broadband to access remote learning, telework, or telehealth. Listed below are the Tribes whose Tribal Lands are wholly or partly located within Montana and the amounts they have received from the program, for a total of $142,978,584.

Exhibit 12: Broadband Funding for Tribes wholly or partly located in Montana

Name of tribe	Amount received
Confederated Salish and Kootenai Tribes	$41,572,832
Chippewa Cree Tribe	$15,300,357
Blackfeet Tribe of the Blackfeet Reservation	$33,235,004
Northern Cheyenne Tribe	$52,870,391

3.2 Partnerships

This section answers the question: who are MBO's partners in broadband deployment and adoption, and how does MBO plan to work with them?

Exhibit 13: Partners

Partners	Description of Current or Planned Role in Broadband Deployment and Adoption
Montana Counties, Cities and Towns	MBO is partnering with local governments to increase local stakeholder participation and outreach. Local governments publicize broadband efforts, including opportunities for public

Partners	Description of Current or Planned Role in Broadband Deployment and Adoption
	input, so that the community is informed and can participate in the process
Montana Department of Public Health and Human Services	MBO partners with the Department to understand the impact of broadband access for public health programs and health facilities, as well as the impact of broadband access for the health of covered populations
Montana Department of Transportation	MBO collaborates with the Department to streamline upcoming broadband deployment opportunities, including by working to establish right-of-way and dig-once policies (for more details see Sections 4.3.1 and 4.3.2)
Montana Department of Labor and Industry	MBO collaborates with the Department to understand how broadband deployment and digital opportunity can have an impact for the state's current workforce development plans, goals, and strategies
Montana Public Service Commission	MBO partners with the Commission to better understand the public assets that could support broadband deployment
Montana Department of Corrections	MBO partners with the Department to understand and improve the state of broadband and/or device access for incarcerated individuals
Montana State Library	MBO partners with the library system to develop digital opportunity initiatives including digital training for covered populations
Montana Department of Environmental Quality	MBO coordinates with the Department to ensure that broadband deployment supports DEQ's mandate to regulate air, water, and ground resources in line with Montana's environmental laws
Montana Department of Natural Resources	MBO coordinates with the Department to ensure that broadband deployment supports DNR's mandate to administer Montana's land and water resources and complies with any requirements of the Board of Land Commissioners
Office of the Commissioner of Higher Education	MBO partners with the Office to understand current barriers and implement broadband deployment and digital opportunity programs that serve higher ed students
Office of Public Instruction	MBO partners with the Office representing the K-12 sector in implementing broadband deployment and digital opportunity strategies that serve Montana students
Internet Service Providers (ISPs)	MBO partners with local ISPs that provide service to Montanans to track and report on the progress of broadband adoption, to ensure that accessible options are offered to low-income households, and to deploy broadband across the state

Partners	Description of Current or Planned Role in Broadband Deployment and Adoption
BroadbandMT	MBO collaborates with BroadbandMT as it represents the interests of Montana's locally owned community based broadband providers, to understand their needs and concerns and partner with their member ISPs in broadband deployment
Tribal Nations	MBO partners closely with the Tribal Nations, including the Governor's Office of [Native American] Affairs to ensure broadband goals and strategies are aligned and will serve the needs of tribal populations both on and off reservations

3.3 Asset Inventory

This section answers the question: what are the existing assets available to the Montana Broadband Office in its work furthering broadband deployment, adoption, affordability, access, and digital opportunity?

In the State of Montana, both public and private entities have made concerted efforts to bridge the digital divide. Montana has conducted a detailed review of available assets that are being used to advance Digital Opportunity, both through online research and through interviews with the leaders of several state agencies.

The digital asset inventory is organized as follows:

- **Section 3.3.1**: hard assets to support broadband deployment
- **Section 3.3.2**: assets that promote broadband adoption and are administered by non-government entities in the State of Montana
- **Section 3.3.3**: assets that promote broadband affordability and are administered by non-government entities in the State of Montana
- **Section 3.3.4**: assets that promote access to broadband and are administered by non-government entities in the State of Montana
- **Section 3.3.5**: programs and plans to advance digital opportunity instituted by municipalities, CAIs, and organizations across the State of Montana

3.3.1 Broadband Deployment

The table below identifies assets that promote broadband deployment, including state-owned infrastructure in the State of Montana. See Section 3.2: Partnerships for more details on the relevant departments.

Exhibit 14: Broadband Deployment Assets

Asset Name	Description
Rights of way	Department of Transportation grants use of longitudinal right-of-way along interstate highways to eligible projects
Land managed by Montana DEQ	Tracts of public land belonging to the Department of Environmental Quality may be available for deployment via right-of-way laws
Land managed by Montana DNR	Tracts of public land belonging to the Department of Natural Resources may be available for deployment via right-of-way laws
LED light poles at highway exit ramps	LED light poles belonging to the Department of Transportation may be available for deployment of 5G nodes, which could support Montana's broader broadband goals beyond the BEAD program

Please see Section 3.4.1.7: Increased workforce available to deploy broadband below for more details on labor available to deploy broadband.

3.3.2 Broadband Adoption

The table below includes assets that promote broadband adoption and are administered by non-government entities in the State of Montana. While the goals of the listed assets could advance digital opportunity, these efforts are relatively small scale. This gap in support of broadband adoption will be filled through the Digital Opportunity Plan's strategies referenced in Section 5.1 of Montana's Digital Opportunity Plan.

Exhibit 15: Broadband Adoption Assets

Organization Name	Asset Name	Description	Covered Population	Link
Community Skills Initiative by Montana Chamber Foundation	Community Skills Initiative	This free program helps job seekers successfully navigate the paths to in-demand roles in a more digital economy by promoting digital skills and employability	All	https://www.communityskilling.org/partner/montana

3.3.3 Broadband Affordability

This section includes assets that promote broadband affordability and are administered by non-government entities in the State of Montana.

While Montana is home to many residents who qualify for the ACP, use of the program remains low. For more information about ACP eligibility and adoption, please refer to Section 3.4.3. Many ISPs serving Montana residents offer affordable plans, a non-exhaustive sample of which are listed below.

An opportunity exists to develop additional efforts to increase broadband affordability, as this is a major challenge to access faced by Montana's residents. For more information about how the affordability gap will be addressed, please see section 5.1 of the Digital Opportunity Plan.

Exhibit 16: Broadband Affordability Assets

Organization Name	Asset Name	Description	Covered Population	Link
Triangle Communications	Community Wi-Fi	Triangle provides access at all of our Community Wi-Fi hotspot locations.	All	https://www.itstriangle.com/services/misc/community-wifi#locations

In addition to the above inventory, several ISPs offer low-cost plans, including:

- Frontier ISP[13]
- TruConnect[14]

According to USAC[15], some ISPs offer plans that, with the ACP, cost $0, including:

- Spectrum (Charter Communications Operating, LLC)[16]

According to USAC[17], many ISPs / organizations also offer discounted devices:

- PCs for People
- Ztar Mobile, Inc
- Sano Health LLC
- Cintex Wireless, LLC
- SafetyNet Wireless
- Airtalk Wireless
- IDT Domestic Telecom, Inc.
- Sage Telecom Communications, LLC
- Boost Mobile
- Infiniti Mobile
- Clear Wireless, LLC
- Global Connection Inc. of America
- Treasure State Internet & Telegraph
- human-I-T
- Straight Talk, Total Wireless, Simple Mobile, Walmart Family Mobile, TracFone, Net10, Page Plus and Go Smart
- UVNV, Inc.
- NewPhone Wireless, LLC
- Clear Wireless, LLC
- Selectel Wireless
- Excess Telecom, Inc.
- Boomerang Wireless, LLC
- SWA Connect, LLC
- TruConnect[18]

[13] Frontier, https://frontier.com/discount-programs/affordable-connectivity-program
[14] TruConnect, https://www.truconnect.com/states/montana
[15] Universal Service Administrative Co., https://cnm.universalservice.org/
[16] Spectrum, https://www.spectrum.com/internet/spectrum-internet-assist
[17] Universal Service Administrative Co., https://cnm.universalservice.org/
[18] TruConnect, https://www.truconnect.com/devices

3.3.4 Broadband Access

This section includes assets that promote access to broadband and are administered by non-government entities in the State of Montana. See Section 3.4.4.1 below for more details on the state library system as a key source of public Wi-Fi. Other resources are listed below.

Exhibit 17: Broadband Access Assets

Organization Name	Asset Name	Description	Covered Population	Link
Libraries	Library Wi-Fi locations throughout Montana	Public libraries provide free Wi-Fi throughout the State of Montana	All	https://montana.maps.arcgis.com/apps/instant/nearby/index.html?appid=a733846b0bdd4e44a1f36aff4f89b411&&center=-109.7809,46.6429&level=5
Triangle Communica-tions	Community Wi-Fi	Triangle provides access at all of our Community Wi-Fi hotspot locations.	All	https://www.itstriangle.com/services/misc/community-wifi#locations
Pacific Northwest Rural Broadband Alliance	Co-op broadband	This non-profit, focused on building rural broadband service for communities that are unconnected or underserved, delivers internet to customers via rooftop-mounted wireless receivers which blanket the region in service	Rural	https://nwbroadbandalliance.org/
Yellowstone Fiber	Montana's first high-speed all-fiber internet network, and the state's first Open Access FTTH network	This nonprofit aims to provide fiber access to every address in the City of Bozeman and begin to extend the network deep into Gallatin County. This open access Fiber to the Home (FTTH) network increases competition and allows customers to select the best service at the best price	All; rural	https://www.yellowstonefiber.com/faqs/

3.3.5 Digital Opportunity

This section includes programs and plans to advance digital opportunity instituted by municipalities, CAIs, and organizations across the State of Montana. There are a number of strategies, resources, plans, and programs in the state specifically focused on promoting and enabling digital opportunity for covered populations. These programs highlight the importance of Community Anchor Institutions as key partners in helping to close the digital divide, as many are administered by libraries and colleges. These programs can be built on and supplemented with additional efforts to improve Digital Opportunity.

Exhibit 18: Digital Opportunity Assets

Organization Name	Asset Name	Description	Covered Population	Link
Montana Public Library partners	Montana Public Library Partners with internet and adaptive services	Montana public libraries now have expanded broadband width capacity for internet services, adaptable OPAC computers for access by Montana residents with disabilities, and trained staff on the use of these products	All; individuals with disabilities	https://msl.mt.gov/tbl/other_resources/public_library_partners
Dawson Community College	Gold Card Program	Program for seniors to use internet services and take classes provided by the community college at no extra cost	Aging populations	https://www.dawson.edu/file_download/4f007d4c-453d-40d6-a7d7-2a5219152ba1
Montana Registered Apprenticeship	MT Technology Apprenticeship Programs	Offers programs covering computer and office machine repair, computer user support, and computer programming	All; veterans	https://apprenticeship.mt.gov/
University of Montana	MonTECH Equipment Loans	MonTECH serves any Montanan with a disability, by loaning devices and equipment and teaching people how to use them	All; individuals with disabilities	https://montech.ruralinstitute.umt.edu/equipment-loans-reuse/
Girl Scouts of Montana and Wyoming	Mobile STEM Learning Center	The Girl Scouts of Montana and Wyoming are planning to launch the Mobile STEM Learning Center to deliver engaging, hands-on curriculum options to girls in rural areas across Montana and Wyoming, especially those in economically disadvantaged and tribal communities	Rural	https://www.fairfieldsuntimes.com/news/state/girl-scouts-of-montana-and-wyoming-launching-mobile-stem-learning-center/article_8d5f256c-ed13-596f-9590-9955d073a94f.html

Organization Name	Asset Name	Description	Covered Population	Link
Pacific Northwest Rural Broadband Alliance	Co-op broadband	This non-profit, focused on building rural broadband service for communities that are unconnected or underserved, delivers internet to customers via rooftop-mounted wireless receivers which blanket the region in service	Rural	https://nwbroadbandalliance.org/
Yellowstone Fiber	Montana's first high-speed all-fiber internet network, and the state's first Open Access FTTH network	This nonprofit aims to provide fiber access to every address in the City of Bozeman and begin to extend the network deep into Gallatin County. This open-access network increases competition and allows customers to select the best service at the best price	All; rural	https://www.yellowstonefiber.com/faqs/
HUD ConnectHome USA	FCC Lifeline Program	The Lifeline Program allows eligible consumers to receive a monthly benefit up to $9.25 towards phone or internet services (and up to $34.25 for those living on Tribal and Native lands)	Low-income; tribal populations	https://www.lifelinesupport.org/get-started/
Disability Rights Montana	Assistive Technology	Disability Rights Montana can assist people with disabilities in obtaining assistive technology devices or services	Individuals with disabilities	https://disabilityrightsmt.org/wp-content/uploads/2020/07/2020-DRM-PAAT-Brochure.pdf
ICanConnect	ICanConnect	National program provides people with both significant vision and hearing loss with free equipment and training	Individuals with disabilities	https://www.icanconnect.org/
State of Montana	Tribal Computer Programming Boost Scholarship Program	HB 644 established a scholarship program, administered by OPI and DLI, to support the development of computer programming courses at high schools located on Native American reservations in the state	Tribal	https://leg.mt.gov/bills/2021/billpdf/HB0644.pdf
State of Montana	HB 219	HB 219 established a computer coding student training pilot grant	Tribal	https://leg.mt.gov/bills/2021/billpdf/HB0219.pdf

Organization Name	Asset Name	Description	Covered Population	Link
		program for tribal communities. Grant recipients included Code Girls United		
Code Girls United	Tribal computer coding pilot project	Code Girls United was awarded a $50,000 state contract, made possible by House Bill 219, to provide training and incentives to students in Native communities for computer coding and programming courses	Tribal	https://www.greatfallstribune.com/story/news/tribal-news/2022/03/22/montana-nonprofit-code-girls-united-computer-programming-coding-tribal-communities/6534622500 7/
Soft Landing Missoula	Coding club	The nonprofit, which works with the local refugee and immigrant community, hosts a weekly coding club in the summer	All; English learners	https://missoulian.com/news/local/coding-club-soft-landing-kids-learn-computer-skills/article_58100409-ec87-5c65-8e8c-3474486b98d6.html
Blackfeet Manpower	Adult education	The organization provides job skills, including computer literacy, for members of the Blackfeet Tribe	Tribal	https://blackfeetmanpower.com/adult-education/
Career Training Institute	Training services	The nonprofit provides employment and training services, such as computer skills training, for low-income individuals	Low-income; All	https://ctihelena.org/about-us/
Montana Office of Public Instruction	K-12 Digital Literacy and Computer Science Guidelines	The purpose of the Digital Literacy and Computer Science (DLCS) guidelines is to provide schools with a framework to prepare students for success in college and careers	All	https://opi.mt.gov/LinkClick.aspx?fileticket=DITR-OpK7jo%3D&portalid=182
Treasure State Foundation	STEM Education	The Foundation is promoting and expanding access to STEM education to help students learn to solve complex problems and increase opportunities later in	All	https://treasurestatefoundation.org/our-initiatives/

Organization Name	Asset Name	Description	Covered Population	Link
		their educations and careers		
Montana Department of Labor and Industry	Growth with Google Partnership	DLI is partnering with Google to provide statewide access to Google Career Certificates in Digital Skills. After earning the certificates, participants are connected with an employer consortium of 150+ companies	All	https://news.dli.mt.gov/News/2022/07/grow-with-google

3.4 Needs and Gaps Assessment

3.4.1 Broadband Deployment

This section has two parts.

The first part (sections 3.4.1.1 through 3.4.1.4) outlines needs and gaps related to the state's broadband deployment. This includes an overview of the broadband office and its associated governance structure (section 3.4.1.1), an assessment of unserved and underserved locations (section 3.4.1.2), an assessment of Community Anchor Institutions' internet service (section 3.4.1.3), and a discussion of how the state will address the needs of high-cost areas (section 3.4.1.4).

The second part (sections 3.4.1.5 through 3.4.1.7) outline additional factors that may influence the state's approach and impact the deployment of broadband. These include needs and gaps as they relate to the legislative context (3.4.1.5), the databases informing broadband deployment (3.4.1.6), and the available workforce (3.4.1.7).

3.4.1.1 Broadband office and associated governance structure

This section answers the question: what is the remit and governance model of Montana's Broadband Office (MBO)?

According to Montana House Bill 297, Montana shall "establish the broadband infrastructure deployment program and shall administer and act as the fiscal agent for the program and is responsible for receiving and reviewing responsive proposals and awarding contracts after review and the governor's approval." The Montana Broadband Office acts under the direction of the Governor's Chief Economic Development Officer with advice from the Governor's

Communications Advisory Commission, as outlined in Montana Senate Bill 531. In service to this mandate, the Montana Broadband Office conducts the following activities:

1. It conducts research and data collection to build the Statewide Broadband Map in collaboration with ISPs
2. It administers grant applications, accepting applications from all broadband providers to provide service to unserved and underserved locations
3. It monitors projects on an ongoing basis to ensure that sub-recipients are compliant with use of grant funds and all pass-through requirements
4. It seeks community participation throughout the development of programs and application review processes

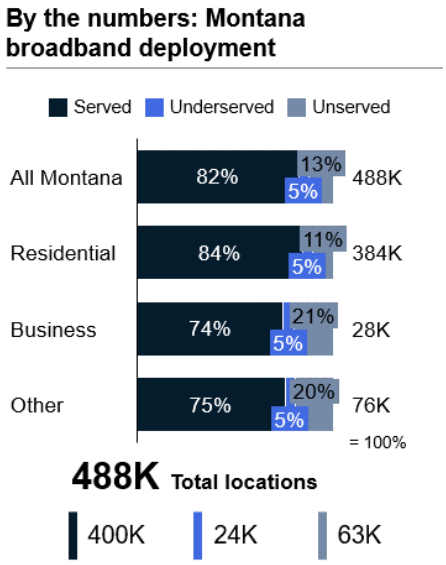
3.4.1.2 Service to unserved and underserved locations

This section answers the questions: where are Montana's unserved and underserved locations, and how much will it cost to serve them? It also explores the question of whether it would be possible to reach all currently unserved and underserved locations with fiber given the funding available.

Within the parameters of BEAD, Montana's priority in broadband deployment is to reach the state's unserved and underserved areas, with a particular focus on the unserved areas. BEAD's main focus is on deploying broadband service to unserved locations (those without any broadband service at all or with broadband service offering speeds below 25 megabits per second (Mbps) downstream/three Mbps upstream) and underserved locations (those without broadband service offering speeds of 100 Mbps downstream/20 Mbps upstream).

Exhibit 19 below shows that 82 percent of Montanans are currently served with broadband speeds of at least 100/20 Mbps, while 5 percent are underserved and 13 percent are unserved. Values for served, underserved, and unserved locations reflect location totals when project areas/locations to be served by RDOF, CAFII, NTIABIP, RUS and Reconnect (prior to February 2022) are considered served. Additionally, looking at location land-use classifications, residential locations have the best coverage with 84 percent served.

Exhibit 19: Montana broadband deployment[19]

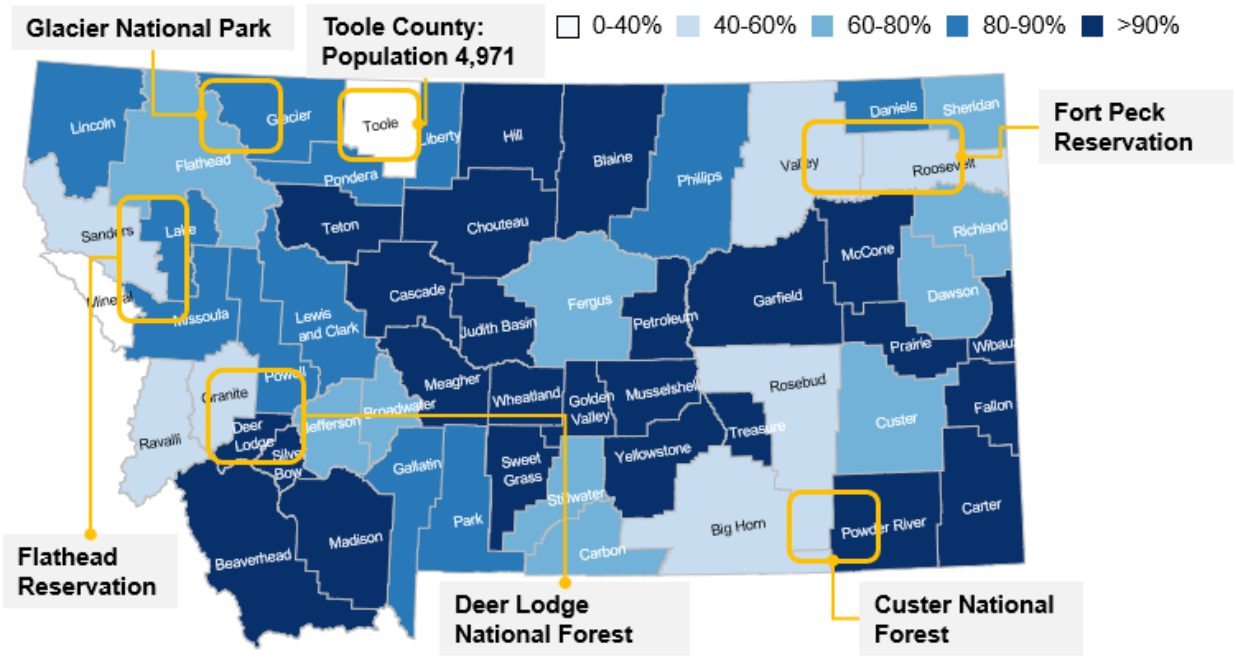


When considering the geographic distribution of broadband access, Exhibit 20 illustrates that several Montana counties are more than 80 percent served. Furthermore,

1. Montana's unserved and underserved locations are spread out across several counties
2. A higher percentage of rural locations are unserved and underserved
3. Some larger counties have a sizable number of unserved and underserved locations, despite having relatively high percentages of served locations.

[19] Service availability based on FCC Broadband Map as of November 18, 2022. Business locations include the land designation (as done by local county assessor) as Business, Industrial, or Recreation. Other locations include the land designation (as done by local county assessor) as Land, Agriculture, Community, Transportation, Communication, Unknown, Other

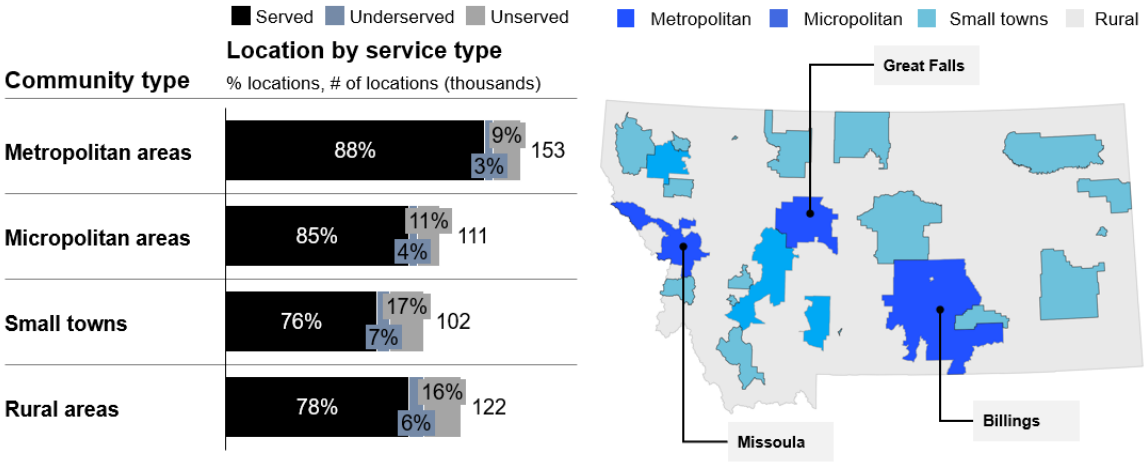
Exhibit 20: Percentage of served locations in Montana counties[20]



As Exhibit 21 below further demonstrates, many of Montana's unserved and underserved locations are in rural areas. Rural Montana is 16 percent unserved and 6 percent underserved while metropolitan Montana is 9 percent unserved and 3 percent underserved. The distribution of each of these community types across Montana is depicted in the Exhibit 21 map:

[20] Service availability based on FCC Broadband Map as of November 18, 2022

Exhibit 21: Unserved and underserved locations by community type[21]

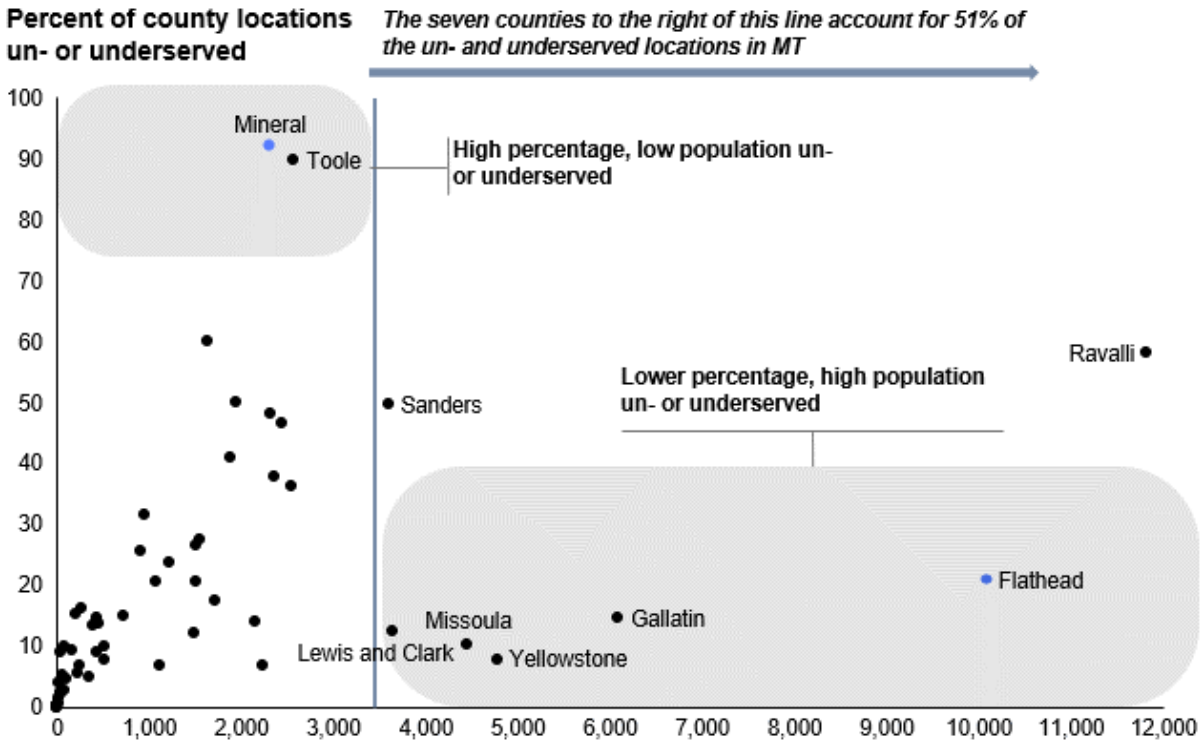


Though rural areas have the highest number of unserved and underserved locations, there are also large concentrations of unserved and underserved locations in a few of Montana's largest counties that have a high percentage of served locations: these include counties such as Flathead, Gallatin, Missoula, and Yellowstone. See Exhibit 22 below for details.

[21] Service availability based on FCC Broadband Map as of November 18, 2022; 2010 Decennial Census estimates from the US Census Bureau, USDA RUCA codes as of November 18, 2022. Values for served, unserved, and underserved locations reflect location totals when locations to be served by RDOF, CAFII, NTIABIP, RUS and Reconnect (prior to February 2022) are considered served. Community type determined by the USDA rural-urban commuting area (RUCA) codes at the Census tract level following:

- Codes 1-3 Metropolitan area (defined as an Urban Area by the US Census and geographies within its primary commuting radius)
- Codes 4-6 Micropolitan area (defined as a large Urban Cluster (population 10k – 50k) within its primary commuting radius)
- Codes 7-9 Small Town (defined as a small Urban Cluster (population 2.5k – 10k) within its primary commuting radius)
- Codes 10 Rural area (defined as geographies outside of both an Urban Area and Urban Cluster)

Exhibit 22: Percentage of locations unserved and underserved by county[22]



The State of Montana has also conducted a preliminary analysis to determine the estimated total BEAD subsidies that would be required to deploy fiber to all unserved and underserved locations in Montana. This initial estimate was developed based on the following:

1. Broadband Serviceable Location fabric that identifies each physical location in the state of Montana that requires broadband service
2. Service availability based on FCC Broadband Map as of November 18, 2022 that classifies each location as served, unserved, or underserved
3. An estimate of the subsidy required to provide fiber internet to each unserved location and upgrade each underserved location that is based on:
    a. The expected capital expenditures required to acquire, engineer and install new fiber access networks
    b. Several factors included for each location's capital expenditure cost, including linear density, terrain, cost differentials, large area densities, distance to central cores/access to roads, etc.
    c. The expected match by a subgrantee (i.e., amount a subgrantee may be able to cover with their own funds) based on the discounted future cash flows over ten years

[22] Service availability based on FCC Broadband Map as of November 18, 2022. Values for served, unserved, and unserved locations reflect location totals when locations to be served by RDOF, CAFII, NTIABIP, Reconnect (prior to February 2022) and RUS are considered served

Assumptions used in this analysis to determine the total subsidies required include:

- Service availability estimates are based on BEAD definitions of served (speeds greater than 100 Mbps downstream/20 Mbps upstream), underserved (less than 100/20 Mbps but greater than 25/3 Mbps) and unserved (less than 25/3 Mbps) and the latest statistical estimation model
- Cost model assumes a plant mix representative of how wireline networks have historically been deployed in Montana
- RDOF, RUS, CAF II, Reconnect (prior to February 2022) and NTIABIP funds attributed to mapped locations are counted as served
- Locations to be served under additional funding sources (ARPA funds, USDA Reconnect after January 2022) are not currently counted as served (will be updated in future proposals)
- The top end of the ranges provided below represent the estimated cost of greenfield deployment everywhere (building out new infrastructure), while the bottom end of the ranges is based on the estimated cost of brownfield deployment (using existing infrastructure)

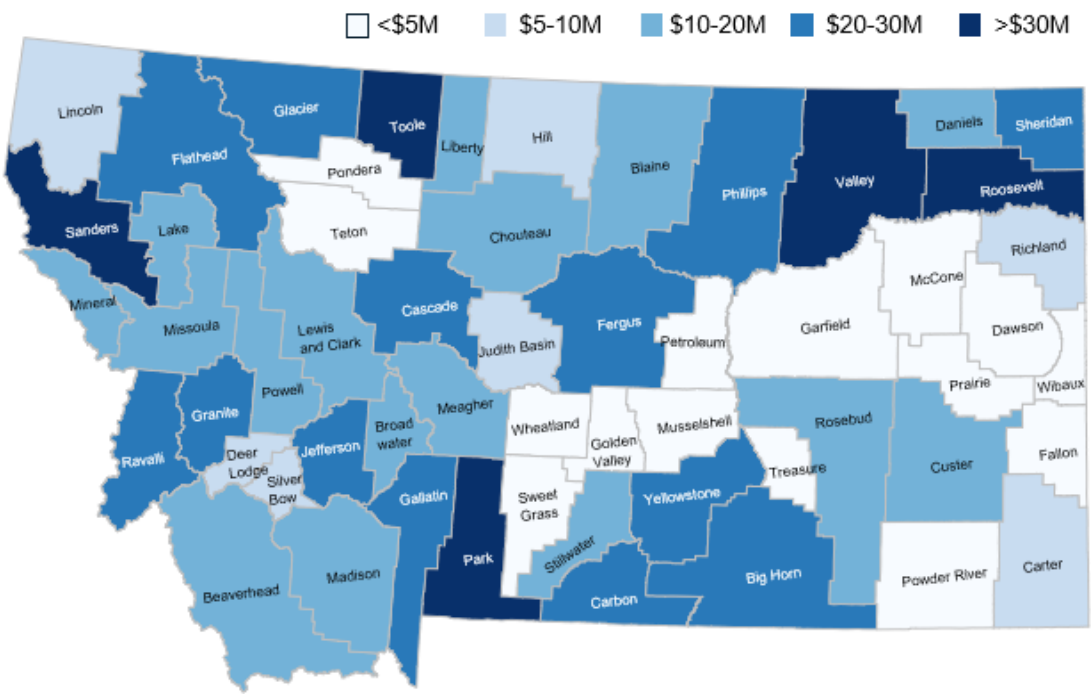
This analysis will be continuously refined as Montana develops the Action Plan, Initial Proposal, and Final Proposal. This iterative process will help to ensure the most accurate and comprehensive information that will inform Montana's BEAD execution. A number of factors may impact the results of this analysis, including inflation, supply chain challenges, updated service availability information, and changing technological information, among others.

Given the large number of unserved and underserved locations spread across the state, Montana may not have sufficient funding to connect all unserved and underserved locations with fiber. Initial analysis of the estimated cost to serve at a location level shows:

1) It will cost $690-830M in total government subsidies to deploy fiber to all unserved and underserved locations in Montana
2) The average cost to serve is $7.8-9.4K per unserved and underserved location
3) A 100 percent fiber buildout to all unserved and underserved locations may be significantly more expensive than the estimated broadband allocations

Exhibit 23 below demonstrates the variability in costs across Montana to deploy fiber to unserved and underserved locations. Four counties (Valley, Toole, Roosevelt, Park, and Sanders) would each require more than $30M to deliver on that goal.

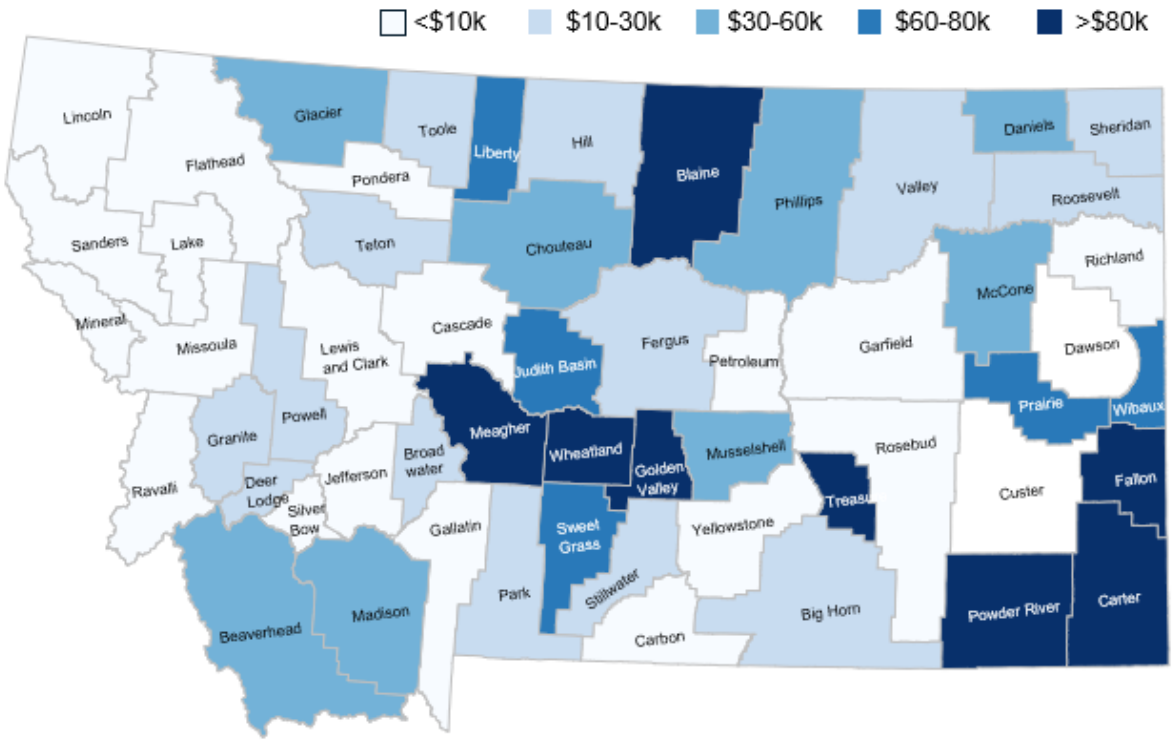
Exhibit 23: Total subsidy to serve by county[23]



An analysis of the average cost to serve demonstrates similar variability, with an overall average cost to serve of $7.8-9.4K per location. Eight counties (Golden Valley, Carter, Blaine, Meagher, Wheatland, Fallon, Powder River and Treasure) have an average cost to serve of more than $80,000 per location. On the other hand, 21 counties have an average cost to serve of less than $10,000 per location. See Exhibit 24 below for details.

[23] Service availability based on FCC Broadband Map as of November 18, 2022. Cost data provided by BroadbandLab licensed data provider as of November 18, 2022. $909-1,096M in total BEAD subsidy needed if you exclude current RDOF awards, but include other programs (CAFII, NTIABIP, RUS, Reconnect (prior to February 2022))

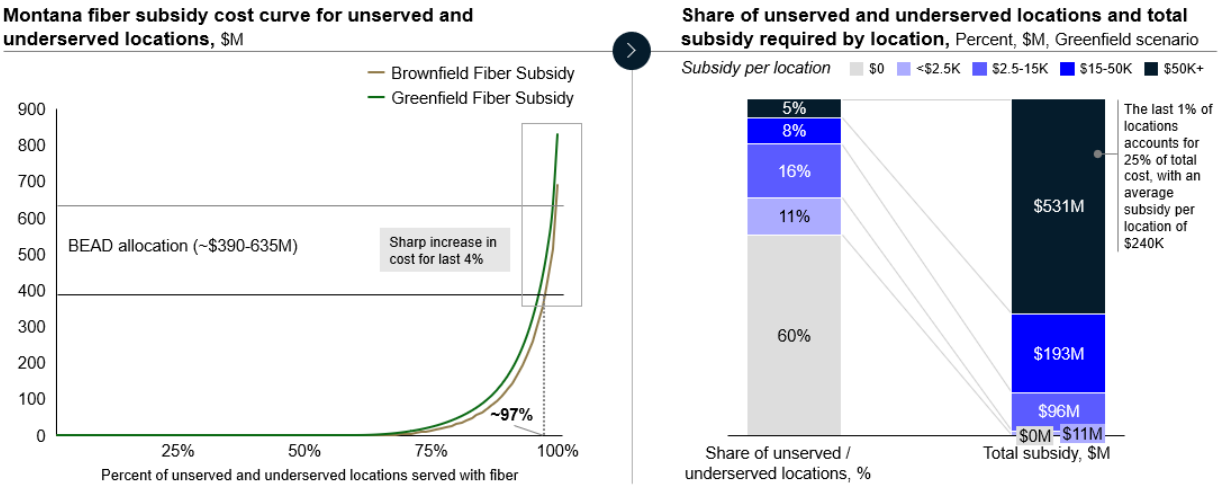
Exhibit 24: Average cost to serve per location by county[24]



Finally, analysis shows that a 100 percent fiber buildout may be significantly more expensive than the estimated allocations from BEAD and other state and federal broadband programs. In such a scenario, ten percent of unserved and underserved locations would account for 81 percent of the total subsidy needed (~$690-830M). Given the total funding that will be dispersed to eligible entities is $42.5B, Montana is likely to have a significant shortfall in providing fiber to all unserved and underserved locations. See Exhibit 25 below for details:

[24] Service availability based on FCC Broadband Map as of November 18, 2022. Cost data provided by BroadbandLab licensed data provider as of November 18, 2022

Exhibit 25: Montana fiber subsidy cost curve for unserved and underserved locations[25]



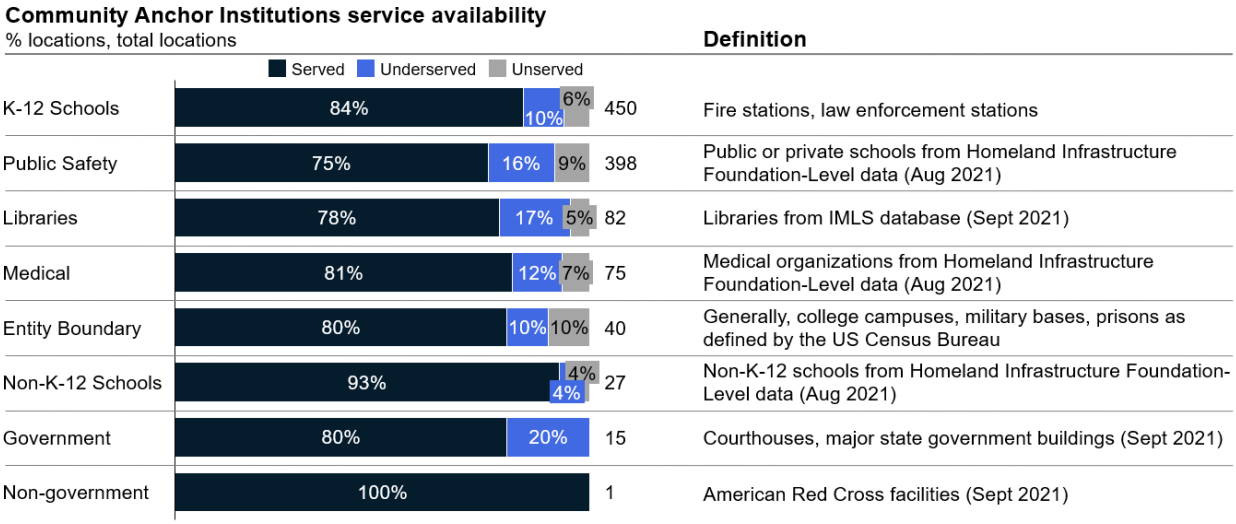
3.4.1.3 Service to Community Anchor Institutions (CAIs) without gigabit service

This section answers the question: what are the needs of CAIs?

MBO will be building out service to unserved and underserved CAIs, including schools, libraries, and medical centers, among others. Montana may also consider a more inclusive definition of CAIs, as there are a number of other institutions in rural Montana that may serve as one of the only anchors in the community (e.g., ranger station, local bar and grill). Given the importance of CAIs in providing needed services for Montana residents, a focus on delivering high-speed internet to CAIs will have an outsized impact on achieving the state's broader goals. Currently, many CAIs across the state have gaps in access to high-speed internet. As shown in Exhibit 26 below, 80 percent of CAIs are currently served, similar to the overall percentage of served locations in Montana, while the percentage of unserved locations (seven percent) is lower than the statewide rate. Public safety and entity boundary locations have the highest rate of unserved locations at nine percent and ten percent, respectively.

Service availability data provided by FCC Broadband Map as of November 18, 2022. Cost data provided by BroadbandLab licensed data provider as of November 18, 2022. Estimates for fiber subsidy required assumes that locations connected by RDOF, RUS, CAF II, NTIABIP, and Reconnect (prior to February 2022) are considered served. Subsidy required by location is calculated based on the Net Present Value (NPV) investment required for the location and estimated ISP match based on the future cash flows

Exhibit 26: Community Anchor Institutions service availability[26]



3.4.1.4 Solutions to funding barriers in designated "high-cost areas"

This section answers the question: how does Montana plan to approach deployment to high-cost areas?

In accordance with both Montana's vision and the requirements of the BEAD program, Montana's first priority is to provide fiber to all unserved locations in the state, followed by underserved locations. However, as noted in Section 3.4.1.2, the total cost to serve all unserved and underserved locations with fiber (and even just the unserved locations) may be significantly higher than the available funding from BEAD and other sources. Due to this shortfall, Montana will explore all technological means necessary to achieve its internet connectivity goal of providing high-speed internet to all Montanans, drawing on a flexible combination of fiber optic cable, fixed wireless, and satellite deployment to reach homes, businesses, and Community Anchor Institutions such as schools and hospitals. Given the remote nature of many locations in Montana, fiber optic deployment may not be economically (or even technically) feasible. Montana will therefore establish an Extremely High-Cost per Location Threshold to determine the point at which other technologies will be explored. In light of the state's topography, satellite in particular may be the only viable option in the most remote locations.

Montana is currently exploring various scenarios for establishing the Extremely High-Cost per Location Threshold in a manner that will ensure efficient deployment of federal funds. While

[26] Service availability and cost data provided by BroadbandLab licensed data provider as of November 18, 2022. Served, underserved and unserved follow normal location guidelines (100/20 and 25/3 standards). To date, data does not measure gigabit service to CAIs

prioritizing fiber to the unserved wherever possible, Montana may also explore additional priorities, such as upgrading service for the underserved covered populations.

3.4.1.5 Legislative solutions to accelerate infrastructure deployment

This section answers the question: what legislation is already in place and what is being developed to accelerate infrastructure deployment?

Dig once legislation

Background

In Montana, HB 494 currently requires the Department of Transportation to notify broadband companies when the state is making plans for highway construction or repairs and encourage them to install conduit at the same time.[27] This policy can reduce the cost of deploying fiber, as a signficant portion of the deployment cost is represented by excavation of roadway to bury cables and conduit.[28]

Impact on BEAD deployment

Montana's "Dig Once" legislation minimizes the disruption and expense of building out conduit and expanding broadband infrastructure.

Right-of-way legislation

Background

According to SB392, passed in 2021, the Department of Transportation assigns public rights of way, which grants use of longitudinal right-of-way along interstate highways to eligible projects.[29] Providers will be required to pay for the fair market value of the portion of right-of-way they are using. The Montana Association of Counties establishes guidelines for public rights of way for streets managed by Montana's 56 counties. Twenty states currently have laws enabling providers to obtain a single telecommunications franchise to access PROW for cable installation instead of negotiating separate agreements with local authorities.[30]

Impact on BEAD deployment:

Right-of-way legislation could allow ISPs to access PROW as needed for broadband deployment.

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[27] Montana HB 494, https://leg.mt.gov/bills/2021/billpdf/HB0494.pdf
[28] Minimizing Excavation Through Coordination, Policy and Governmental Affairs Transportation Policy Studies, U.S. Department of Transportation Federal Highway Administration, https://www.fhwa.dot.gov/policy/otps/policy_brief_dig_once.pdf
[29] Montana Senate Bill 392, https://leg.mt.gov/bills/2021/SB0399/SB0392_1.pdf
[30] Carl E. Kandutsch, Stephen Mayo, Kate McMahon and Tom Garrison, "Local Management of Public Rights-of-Way," https://www.kandutsch.com/articles/local-management-of-public-rights-of-way

3.4.1.6 Improved databases that enhance use of information to inform broadband deployment

This section answers the question: what state-specific databases will help inform broadband deployment?

Montana has built two specific data resources to assist with identifying priority areas for broadband deployment: a state broadband map and detailed demographic data.

Montana broadband map

The Montana Broadband Office has partnered with a third party to acquire/develop the following:

1. Broadband Serviceable Location (BSL) fabric for the State of Montana
2. Service availability data from ISPs
3. Comparison of Montana's BSL fabric and availability with FCC data to enable generation of a comprehensive broadband map

Montana already collected the first service availability data in December 2021 and in September 2022, completed the first update. Upon release of the FCC map, Montana will conduct a detailed comparison of both data sources in order to generate the most comprehensive broadband map to inform deployment.

Montana demographic data

Montana has conducted a detailed analysis of federal demographic data as it relates to service availability, adoption, and affordability. This data will help inform broadband deployment by ensuring the BEAD and Digital Opportunity programs account for the needs of covered populations. Available federal demographic data relevant to Montana has been consolidated by the Census and Economic Information Center at the Montana Department of Commerce. By overlaying data on locations of covered populations with availability, adoption, and affordability data, Montana can develop a more targeted strategy to close the digital divide.

3.4.1.7 Increased workforce available to deploy broadband

This section answers the questions: what roles are necessary for deploying broadband and what labor shortages are anticipated?

Over the next four years, analysis projects that over 50 percent of broadband-related roles will see shortages, especially outdoor, labor-intense roles. Manual roles are where the largest gaps are expected, including laborers, locators, foremen, restoration crews, and project managers. The roles with the highest projected 2026 gaps are listed below, with the projected gap and the percentage of total in parentheses:

Laborers: ~1.6K (~36 percent)

Locators: ~0.8K (~18 percent)

Foremen: ~0.6K (~14 percent)

Restoration crews: ~0.4K (~9 percent)

Project manager: ~0.3K (~6 percent)

Exhibit 27 shows a year over year projection for each position and expected shortages

Exhibit 27: Montana labor gap heatmap[31]

Pre-construction | Construction | Post-construction

Montana labor gap heatmap, FTEs — Gap<(500) | (500)<Gap<(100) | (100)<Gap<0 | Gap > 0

		2022	2023	2024	2025	2026	2027	2028	2029	2030
Pre-construction	Land surveyor	(51)	(66)	(77)	(83)	(115)	(92)	(80)	(79)	(56)
	Pole surveyor	3	2	2	2	0	1	2	3	4
	OSP engineer	(51)	(67)	(78)	(85)	(120)	(95)	(82)	(80)	(54)
	Procurement lead	(27)	(35)	(41)	(45)	(62)	(50)	(43)	(43)	(30)
	Estimator	(20)	(28)	(34)	(38)	(55)	(43)	(36)	(36)	(23)
	Structural engineer	4	3	3	3	3	3	3	3	4
Construction	Project manager	(102)	(139)	(165)	(179)	(262)	(196)	(158)	(151)	(81)
	Foreman	(272)	(350)	(407)	(442)	(611)	(491)	(426)	(422)	(295)
	Laborer	(658)	(879)	(1,037)	(1,136)	(1,610)	(1,272)	(1,089)	(1,076)	(718)
	Aerial lineman	46	34	26	21	(6)	12	22	23	42
	Trucking crew	(10)	(16)	(20)	(23)	(36)	(26)	(21)	(21)	(11)
	Restoration crew	(188)	(242)	(282)	(306)	(424)	(340)	(294)	(291)	(201)
	Mechanic	(16)	(21)	(24)	(26)	(37)	(29)	(25)	(25)	(17)
	Quality inspector	(51)	(67)	(77)	(84)	(117)	(94)	(81)	(80)	(56)
	Safety lead	(69)	(89)	(103)	(113)	(156)	(125)	(109)	(107)	(75)
	Top hand	2	1	1	1	0	0	1	1	2
	Locator	(327)	(435)	(512)	(558)	(794)	(619)	(522)	(510)	(324)
Post-construction	Splicer	(9)	(29)	(43)	(49)	(97)	(56)	(31)	(25)	19
	Network operator	0	0	0	0	(1)	(1)	0	0	0
	Technician	(2)	(3)	(3)	(4)	(6)	(4)	(4)	(4)	(2)
	Utility liaison	4	4	4	4	4	4	5	5	5
	Underground / line crew	61	60	61	64	60	70	78	83	95
	Traffic control	(8)	(10)	(12)	(13)	(18)	(15)	(13)	(12)	(8)
	Customer service manager	1	1	1	1	1	1	1	1	1
Gross total gap		~(1,900)	~(2,500)	~(2,900)	~(3,200)	~(4,500)	~(3,500)	~(3,000)	~(3,000)	~(2,000)

Montana will partner closely with the Department of Labor and Industry, as well as the Office for the Commissioner of Higher Education and the Office of Public Instruction to develop a workforce development strategy that will ensure adequate labor for the implementation of this program.

3.4.2 Broadband Adoption

Once affordable broadband has been made available, widespread adoption of broadband by Montana households will depend on two factors: ensuring that people have the right devices to

[31] Analysis based on data provided by BroadbandLab licensed data provider, EMSI Burning Glass/Lightcast Labor Market Analytics derived from government sources (e.g., Bureau of Labor Statistics, US Census Bureau), online job postings and online profiles/resumes

access the internet and ensuring that they have the digital skills they need to access the internet. This section surveys the current state of broadband adoption in Montana before addressing each of these two factors in turn.

3.4.2.1 State of broadband adoption in Montana

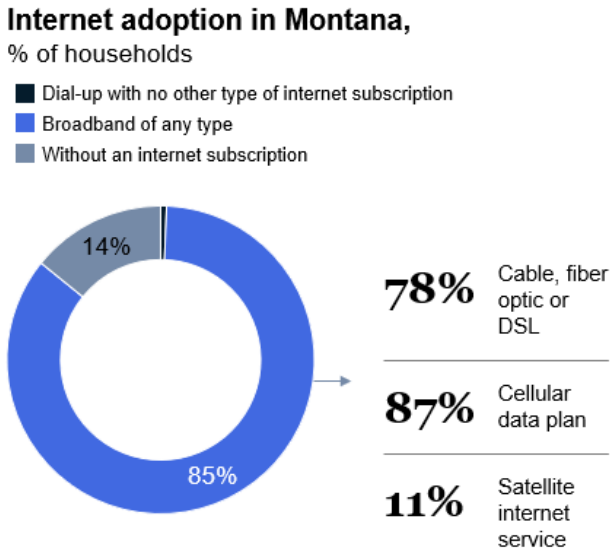
This section answers the question: what is the current state of broadband adoption in Montana?

Even where there is availability of high-speed internet, Montana still has a gap in adoption. Nationwide, Montana ranks 44th in high-speed internet adoption, with 67 percent of households subscribed to high-speed terrestrial broadband (including cable, fiber optic, or DSL).[32]

When considering all forms of internet, such as terrestrial broadband, cellular, and satellite, 89 percent of households have adopted broadband of some type, while 11 percent do not have internet subscriptions of any kind. As shown in Exhibit 28 below, of the households that have adopted internet, 78 percent have cable, fiber optic, or DSL, 87 percent have cellular data plans, and 11 percent have satellite internet service.[33] According to a survey commissioned by the Montana Broadband Office to support development of this plan (n=1,622), 73.8 percent of Montanans without high-speed internet cited lack of availability as the primary reason.[34]

[32] US Census Bureau American Communities Survey (ACS), 2021 5-Year Estimates
[33] US Census Data, 2021 ACS 5-Year Estimates, https://data.census.gov/table?q=internet&g=040XX00US30&tid=ACSST5Y2021.S2801
[34] Survey of Montana residents conducted by MBO Sep-Oct 2022. N=1,622

Exhibit 28: Internet adoption in Montana[35]



Most Montana counties use some form of broadband, either terrestrial or satellite. However, five counties (Rosebud, Glacier, Powell, Mineral, and Roosevelt) have less than 60 percent adoption of non-cellular broadband internet (Exhibit 29).

[35] US Census data 2021 5-Year Estimates, https://data.census.gov/table?q=C17002&g=040XX00US30$0500000,30&tid=ACSDT5Y2021.C17002

Exhibit 29: Terrestrial and satellite broadband adoption by county[36]

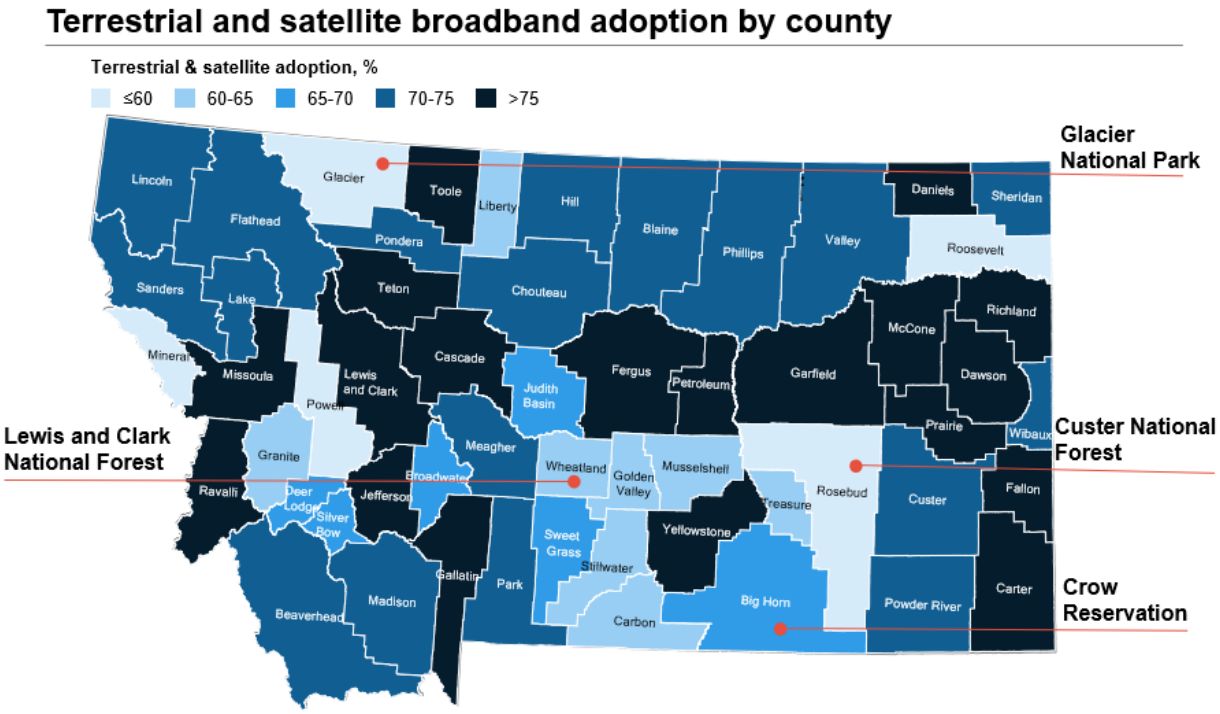
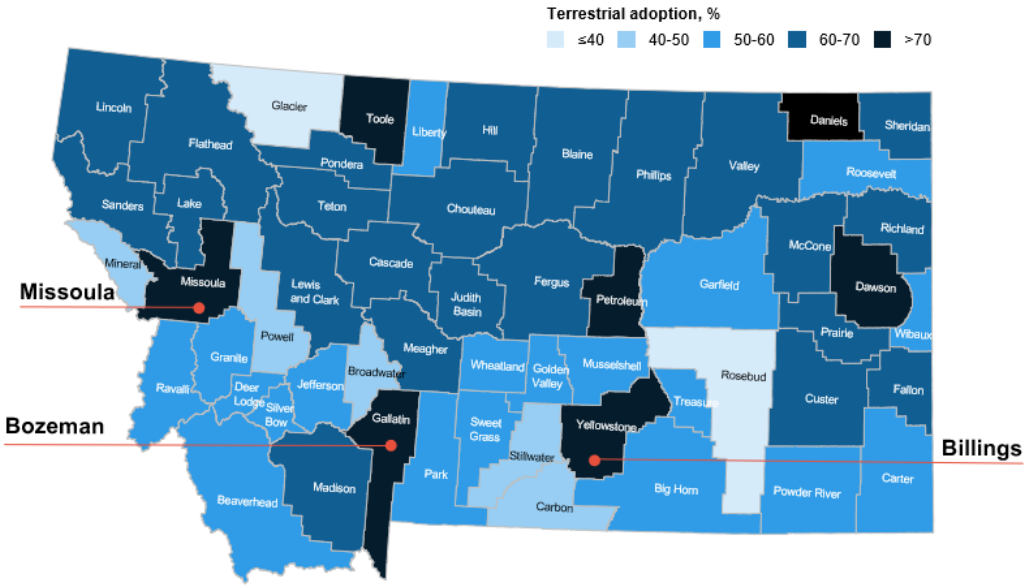


Exhibit 30 below shows that there is significant variation in adoption of terrestrial broadband across Montana counties. Seven counties in the state of Montana have at least 70 percent adoption of terrestrial broadband. Some counties with low rates of terrestrial broadband adoption are surrounded by counties with significantly higher adoption rates (e.g., Broadwater, Glacier), which could be due to topography and population density.

[36] US Census data 2021 5-Year Estimates. https://data.census.gov/table?q=internet&g=050XX00US30063,30061,30027,30069,30025,30023,30067,30065,30021,30029,30095,30051,30093,30091,30059,30015,30057,30013,30099,30011,30055,30097,30053,30019,30017,30041,30085,30083,30081,30005,30049,30047,30003,30089,30001,30045,30043,30087,30009,30007,30073,30071,30037,30079,30035,30077,30033,30075,30031,30039,30109,30107,30105,30103,30101,30111&tid=ACSST5Y2021.S2801

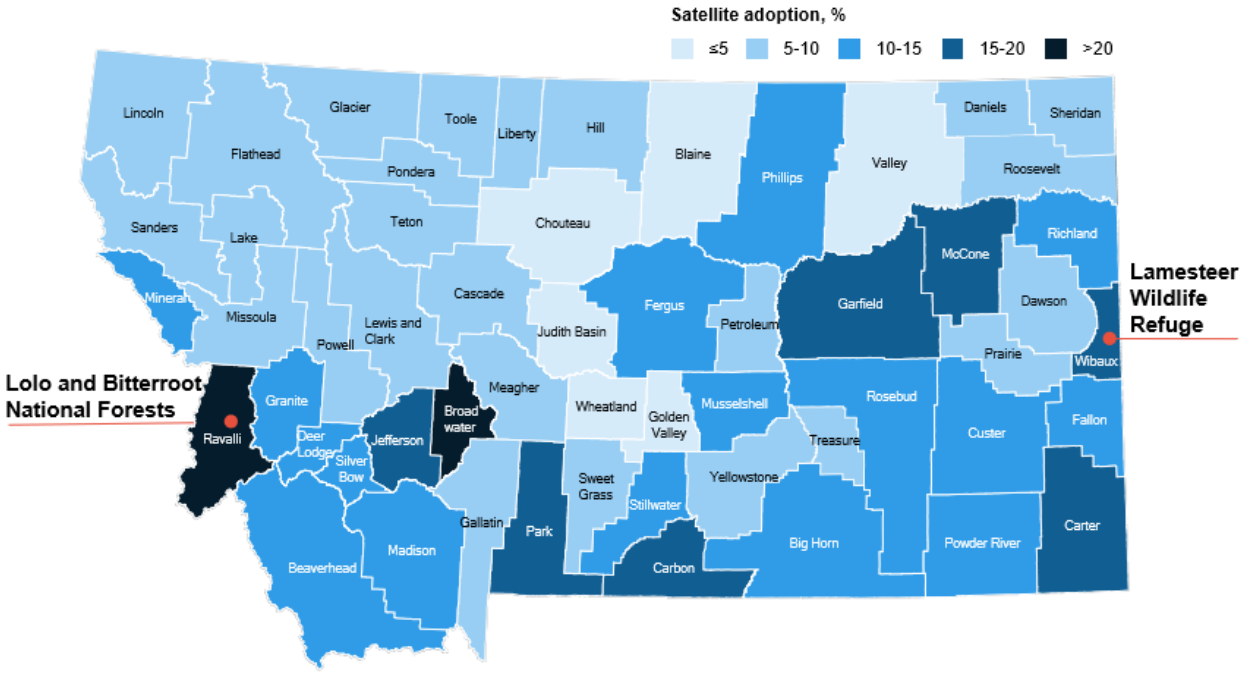
Exhibit 30: Household terrestrial broadband adoption by county[37]



Satellite internet comprises a sizable portion of broadband adoption for several Montana counties. It is largely concentrated in the Southwest and Eastern regions of the state. Two counties rely on satellite for a sizeable portion (>20 percent) of their internet usage: Ravalli and Broadwater counties. The counties with higher satellite internet adoption than others generally have relatively lower terrestrial broadband availability (see *Exhibit 31*).

[37] US Census data 2021 5-Year Estimates. https://data.census.gov/table?q=internet&g=050XX00US30063,30061,30027,30069,30025,30023,30067,30065,30021,30029,30095,30051,30093,30091,30059,30015,30057,30013,30099,30011,30055,30097,30053,30019,30017,30041,30085,30083,30081,30005,30049,30047,30003,30089,30001,30045,30043,30087,30009,30007,30073,30071,30037,30079,30035,30077,30033,30075,30031,30039,30109,30107,30105,30103,30101,30111&tid=ACSST5Y2021.S2801

Exhibit 31: Household satellite broadband adoption by county[38]



As outlined above, the State of Montana faces meaningful challenges in broadband adoption. Some of the main challenges include availability of high-speed internet as outlined in Section 3.4.1.2 and affordability as outlined in Section 3.4.3. Strengthening the state's availability of affordable broadband infrastructure is the first step in promoting adoption. In tandem, Montana may also consider deploying digital literacy programs to empower its citizens to use high-speed internet and the devices necessary to access it. The current needs and gaps as related to access to internet-capable devices and digital literacy are detailed in Sections 3.4.2.2 and 3.4.2.3 below.

3.4.2.2 Increased access to internet-capable devices

This section answers the question: to what extent do Montanans have access to the devices they need to use the internet?

US Census data shows that 8.2 percent of Montana households do not have any kind of computing device (e.g., laptop, smartphone, tablet) and 7 percent only have a smartphone, while 11.5 percent of Montana households with internet access only have access through a cellular data

[38] US Census data 2021 5-Year Estimates. https://data.census.gov/table?q=internet&g=050XX00US30063,30061,30027,30069,30025,30023,30067,30065,30021,30029,30095,30051,30093,30091,30059,30015,30057,30013,30099,30011,30055,30097,30053,30019,30017,30041,30085,30083,30081,30005,30049,30047,30003,30089,30001,30045,30043,30087,30009,30007,30073,30071,30037,30079,30035,30077,30033,30075,30031,30039,30109,30107,30105,30103,30101,30111&tid=ACSST5Y2021.S2801

plan.[39] For better broadband adoption, Montanans need access to internet-enabled devices. The state recognizes this, and some of the programs it offers are listed above under Section 3.3.2: Broadband Adoption. Montana is also working to help more of its residents leverage federal funding to make internet access affordable through the Affordable Connectivity Program (ACP), which offers a one-time discount of up to $100 for a laptop, tablet, or desktop computer with a copayment of more than $10 but less than $50. As part of the Digital Opportunity program, Montana will look to partner with a non-governmental organization to promote increased ACP adoption.

While many internet resources can be accessed with a smartphone only, research shows that some important activities are difficult to perform on a phone. A Pew survey notes that job seekers using phones "often encounter difficulties like accessing and reading content, as well as trouble submitting files and documents."[40] Device access coupled with home broadband helps people perform crucial tasks online. Montana's potential partnership will thus help more Montanans access necessary devices through the ACP.

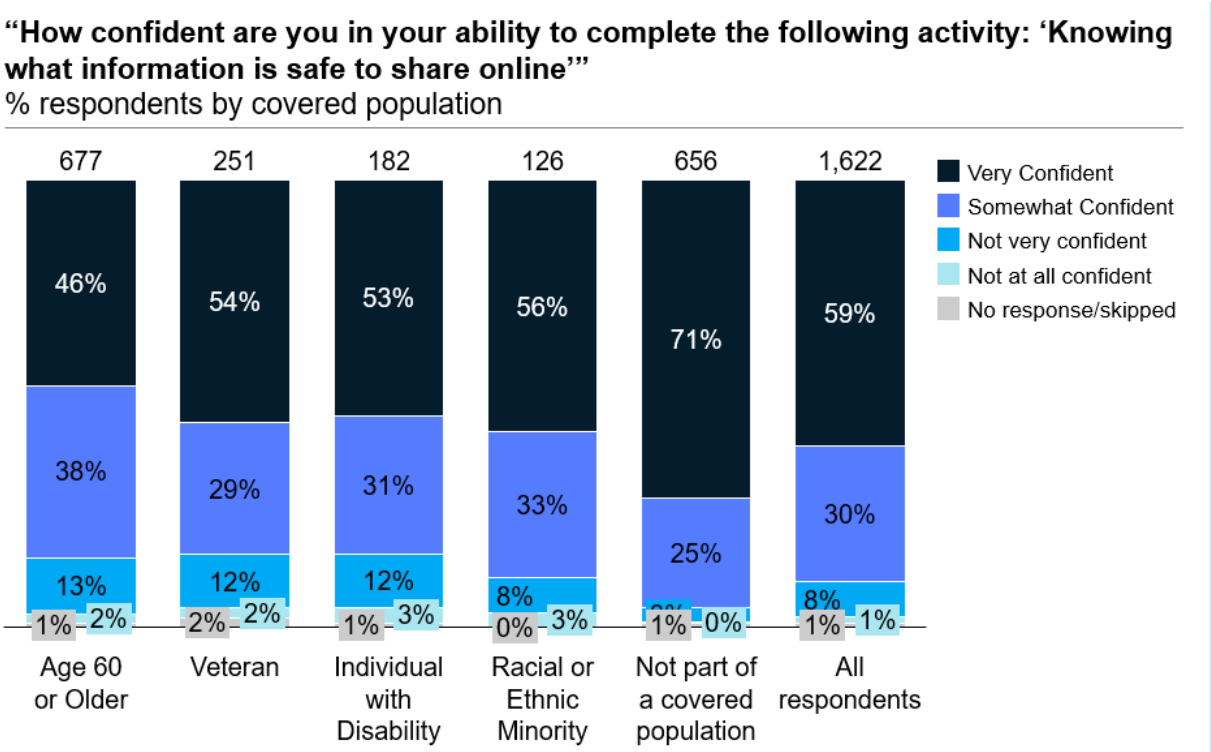
3.4.2.3 Digital skills

This section answers the question: to what extent do Montanans possess the digital skills they need to access the internet?

According to the American Library Association, Digital Literacy is "the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills."[41] Research shows that digital literacy is a significant contributor to the digital divide. Seventy-one percent of US survey respondents without home broadband reported not being interested in having broadband at home, suggesting they may not be aware of its potential,[42] while 33 percent of non-adopters in the US cite lack of comfort with computers and internet as a barrier to adoption, and 42 percent cite privacy and data security concerns.[43] Fifty-nine percent of Montana respondents in a recent survey felt "Very Confident" about knowing what information is safe to share online, with covered populations feeling less confident than the those not in a covered population. See results below:

[39] US Census Data, 2021 ACS 5-Year Estimates, https://data.census.gov/table?q=internet&g=040XX00US30&tid=ACSST5Y2021.S2801
[40] Pew Research Center, "Smartphones help those without broadband get online, but don't necessarily bridge the digital divide," https://www.pewresearch.org/fact-tank/2016/10/03/smartphones-help-those-without-broadband-get-online-but-dont-necessarily-bridge-the-digital-divide/
[41] American Library Association, "Digital Literacy," https://literacy.ala.org/digital-literacy/
[42] Pew Research Center, "Mobile Technology and Home Broadband 2021," https://www.pewresearch.org/internet/2021/06/03/mobile-technology-and-home-broadband-2021/
[43] John Horrigan, "Affordability and the Digital Divide," *EveryoneOn,* https://www.benton.org/headlines/affordability-and-digital-divide

Exhibit 32: Montanans' Confidence Sharing Safe Information Online[44]



Without sufficient digital skills, even a fully built out broadband network will not help Montanans to take advantage of the internet's resources.

3.4.2.4 Multi-sector strategies to further broadband adoption

This section answers the question: how does MBO plan to coordinate with the priorities of other state agencies in pursuing a multi-sector strategy to further broadband adoption?

See Section 5.7: Alignment for more details, with a brief summary provided below.

A. Healthcare policy

The Montana Department of Public Health and Human Services (DPHHS) is prioritizing the continued expansion of telehealth services for behavioral health, primary care, and other health-related needs and recognizes telehealth's importance in increasing access to timely, affordable, and effective health services.[45]

Given Montana's vast area and low population density, residents—particularly in rural areas and on tribal reservations—face considerable barriers to accessing medical care. These geographic

[44] Survey of Montana residents conducted by MBO Sep-Oct 2022. N=1,622
[45] Director of the Department of Health and Human Services, Interview, November 10, 2022

challenges not only impede residents' access to healthcare, but to other essential services, including those offered by Child Protective Services (CPS) and the Office of Public Assistance (OPA). With adequate broadband and internet-capable devices, Montanans could access these services remotely, saving a great deal of time and resources, which would in turn encourage more frequent use.

Lack of broadband and cell service is also a challenge for state agency employees. CPS representatives often lose connectivity when driving to Eastern Montana to conduct wellness checks, posing serious security risks. OPA employees face obstacles enrolling residents in programs like SNAP or Medicaid, often traveling upwards of 100-150 miles to provide support that could be easily offered online. Many of the agencies overseen by DPHHS are understaffed and under-resourced, lacking the technical equipment, such as signal boosters, hotspots, and tablets, necessary to perform their duties. Broadband access and the proper internet-capable devices would significantly improve these employees' ability to conduct their business. Further, given the sensitive nature of the information stored by and transferred to and from these agencies, the Digital Opportunity Plan's online privacy and cybersecurity goals are critical to keep privileged information safe and secure.

B. Education policy

According to the Montana Board of Public Education 2022-23 Strategic Plan, the Board will collaborate with the Montana Digital Academy to support online instruction for students. Several of the Montana Office of Public Instruction's (OPI) initiatives will be bolstered by broadband deployment, including increasing "family, student, and community engagement," which could be made more robust via digital engagement.[46]

OPI's initiatives in STEM, CTE, and workforce development may function symbiotically with the labor gap that exists related to the state's effort to build broadband infrastructure and provide necessary support services. OPI is keen to "expand industry, military, and post-secondary partnerships" and emphasize "STEM, career and technical education (CTE), and workforce development, beginning in middle school." By collaborating on programming, Montana can build a skilled labor force that can support the state's broadband efforts.

C. Workforce policy

By increasing adoption of high-speed internet, Montana will be able to help residents use the state's public workforce and talent development system. Closing the digital divide will enable residents to access Montana's online resources like MontanaWorks[47], where businesses and potential employees can search for each other, and Montana Registered Apprenticeship[48], a paid training program. Furthermore, the implementation of this Five-Year Action Plan will require skilled labor and provide new job opportunities, as the state builds out its broadband infrastructure and works toward closing the digital divide. The State of Montana can pursue partnerships to ensure that the Digital Opportunity Plan's programmatic efforts support the

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[46] Montana Office of Public Instruction Initiatives, https://opi.mt.gov/Portals/182/Superintendent-Docs-Images/OPI%20Initiatives.pdf?ver=2018-08-13-112844-533
[47] MontanaWorks, https://montanaworks.gov/
[48] Montana Registered Apprenticeship, https://apprenticeship.mt.gov/

development of a skilled labor pool that helps close the labor gap needed for broadband deployment and service.

D. Economic development policy

In the wake of the pandemic, Governor Gianforte developed The Montana Comeback Plan[49] to reenergize the Montana economy. The Governor's plan acknowledges the promise of the technology sector and the power of widespread, high-speed internet access. According to the plan, "the high-tech sector, which now exceeds $2 billion per year in revenue in Montana, is our fastest growing industry, and creates jobs that pay double the state average." The infrastructure buildout and subsequent support and service detailed in the BEAD Plan could create significant additional job opportunities.

The "Come Home Montana" campaign and strategy to encourage young Montana college graduates to return to the state has been a key part of Governor Gianforte's strategy to grow the Montana economy.[50] The administration's campaign to encourage relocation back to the state relies on internet connectivity: remote workers need internet connectivity in order to remain productive in remote working environments, and those seeking local jobs in the state will rely on robust broadband connections to further economic growth. Individuals and families relocating from locations where broadband access is available will expect it if they choose to return to Montana.

3.4.3 Broadband Affordability

This section answers the question: what barriers to adoption exist for Montanans as it relates to affordability of broadband?

According to BroadbandNow, only 38.5 percent of households in Montana have access to wired plans, including DSL, copper, cable, or fiber, of 25 Mbps download/three Mbps upload or higher and a standalone broadband speed plan that is $60/month or less.[51]

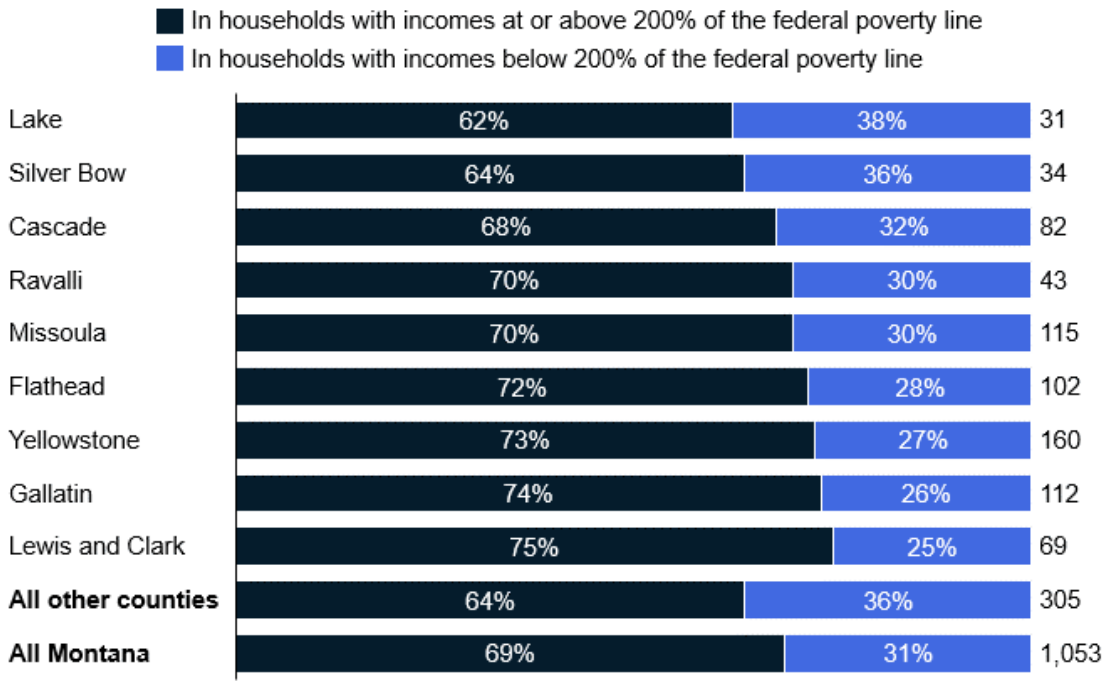
According to the survey commissioned by the Montana Broadband Office (n=1,622), affordability was the second most-commonly cited reason (after availability) for not having access to high-speed internet as 16.8 percent of Montanans without high-speed internet cited lack of affordability as the primary reason for not having adequate internet access.[52] 35 percent of MT households with an income under $20,000 do not have broadband at home, versus 17

[49] https://gregformontana.com/wp-content/uploads/2020/08/Montana-Come-Back-Plan.pdf
[50] "Gov. Gianforte Launches Come Home Montana Campaign," https://news.mt.gov/Governors-Office/gov-gianforte-launches-come-home-montana-campaign/
[51] BroadbandNow; https://broadbandnow.com/research/best-states-with-internet-coverage-and-speed
[52] Survey of Montana residents conducted by MBO Sep-Oct 2022. N=1,622

percent for $20,000-75,000, and 5 percent of those earning above $75,000, indicating a strong relationship between income and internet adoption.[53]

At least 31 percent of Montanans live in a household with income below 200 percent of the federal poverty line, which could pose a barrier to adoption of broadband. However, this group is eligible for ACP enrollment, which would subsidize the cost of their internet service. Counties with lower populations are more likely to have households with income below 200 percent of the federal poverty line (see Exhibit 33).

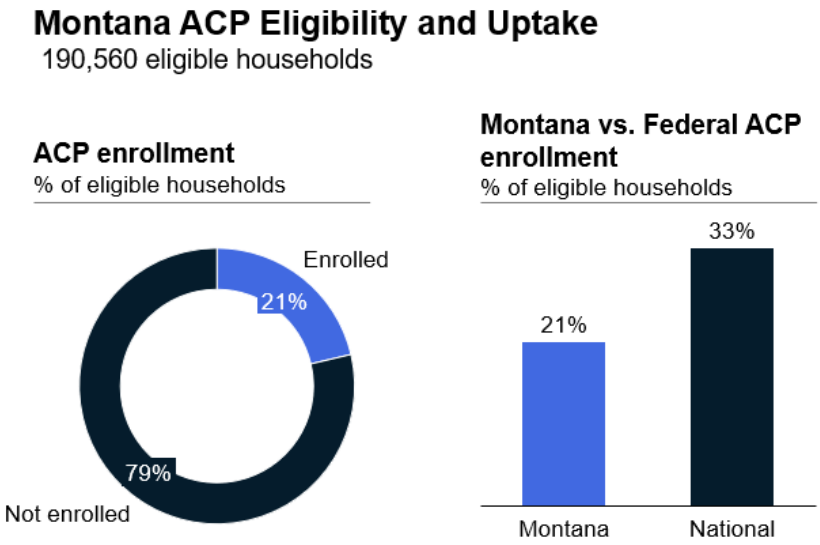
Exhibit 33: Population below 200 percent of the federal poverty line (and eligible for ACP)[54]



Despite the high rate of ACP eligibility among Montanans, at least 70 percent of eligible Montanans have not enrolled in the program, putting the state 41st in national ACP enrollment. At just 21 percent, Montana's ACP enrollment is below the national ACP enrollment average of 33 percent, which presents an opportunity for Montana to focus on increasing ACP enrollment among low-income households (see Exhibit 34).

[53] US Census Data, 2021 ACS 5-Year Estimates. https://data.census.gov/table?q=internet&g=040XX00US30&tid=ACSST5Y2021.S28011
[54] US Census data, 2021 ACS 5-year estimates, census.gov 2016-2020 Housing estimates https://data.census.gov/table?q=C17002&g=040XX00US30$0500000,30&tid=ACSDT5Y2021.C17002

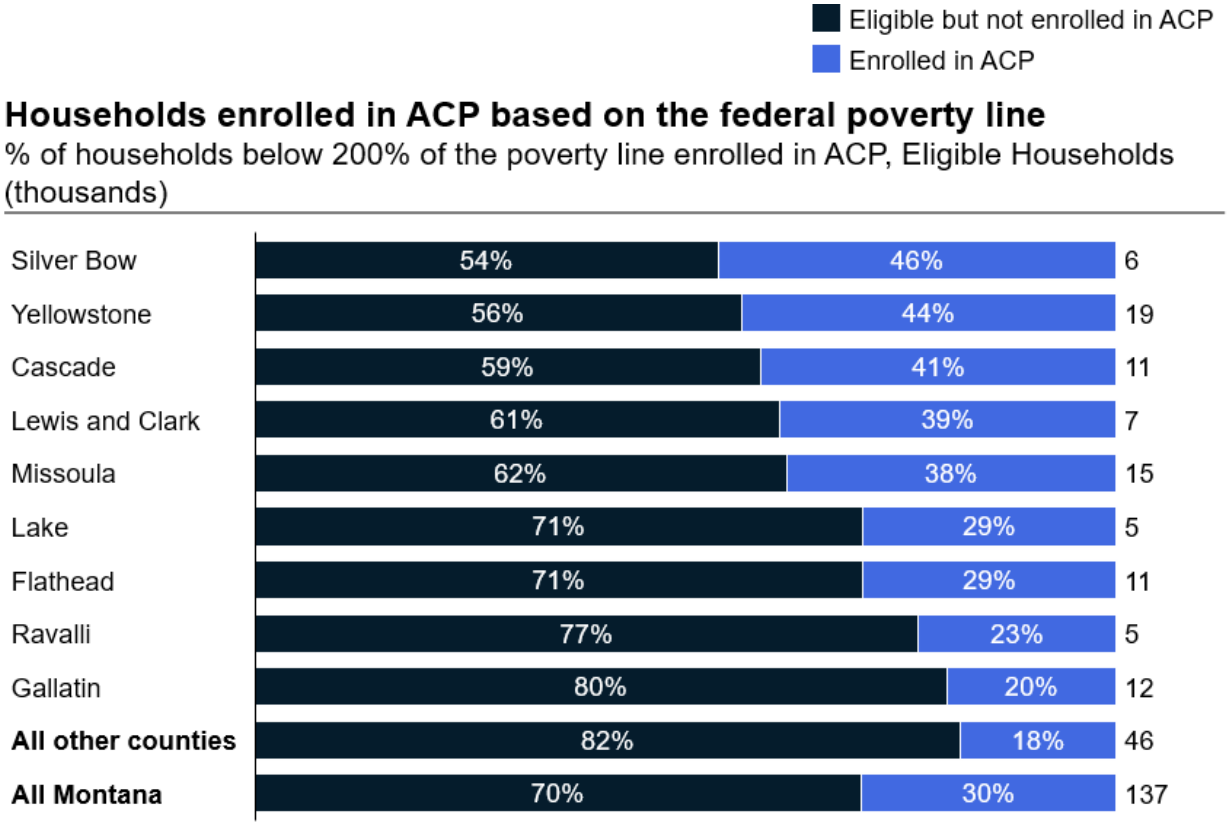
Exhibit 34: Montana ACP Eligibility and Uptake[55]



Counties with smaller populations are also more likely to have a lower percentage of households enrolled in ACP. Between large Montana counties, there is significant ACP enrollment variance, and the smallest 47 counties have significantly lower rates of ACP enrollment than the state as a whole (see Exhibit 35).

[55] US Census data, 2021 ACS 5-year estimates, https://data.census.gov/table?q=C17002&g=040XX00US30$0500000,30&tid=ACSDT5Y2021.C17002

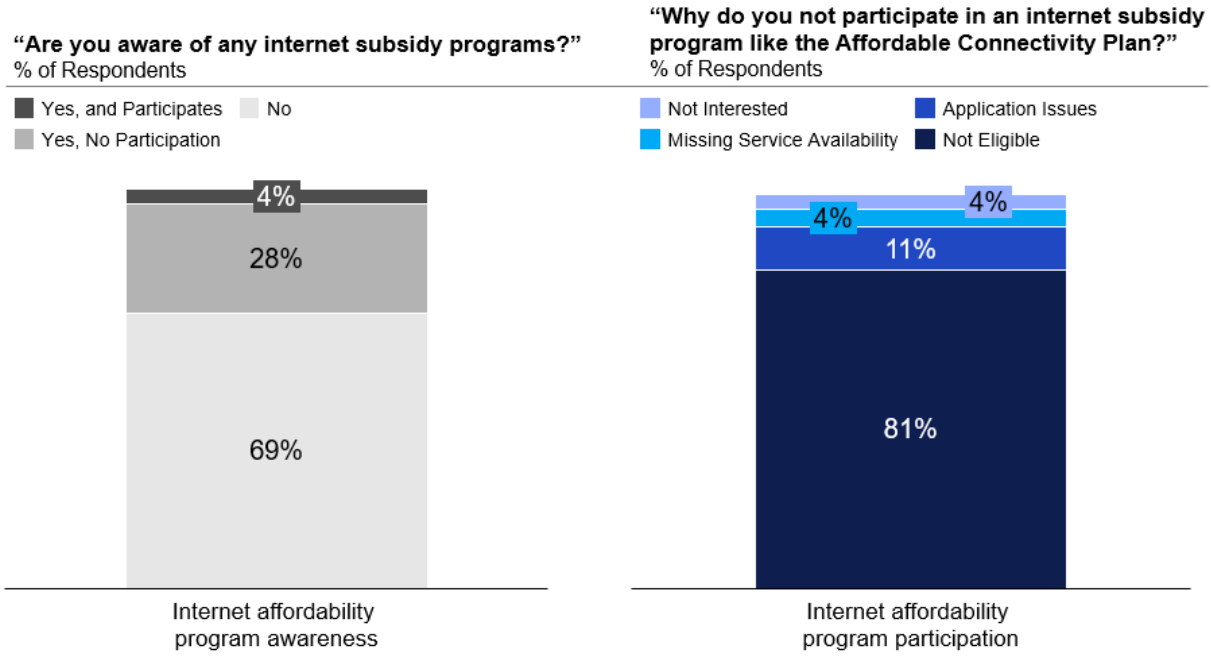
Exhibit 35: ACP Enrollment by County[56]



The Montana Broadband Office's recent survey results indicate that lack of awareness may be a key reason for low ACP enrollment. As Exhibit 36 shows, among survey respondents (n=1,622), 69 percent stated that they are not aware of any internet subsidy programs. Another 28 percent responded that they are aware of internet subsidy programs, but that they do not participate. While some internet providers do inform potential subscribers of ACP eligibility, there are no state, regional, or municipal promotional campaigns, indicating an opportunity to raise awareness and encourage Montanans to take advantage of this program.

[56] US Census data, 2021 ACS 5-year estimates, https://data.census.gov/table?q=C17002&g=040XX00US30$0500000,30&tid=ACSDT5Y2021.C17002

Exhibit 36: Montanans' awareness of and participation in internet subsidy programs[57]



Given the high rate of ACP eligibility, low rate of enrollment, and low rate of awareness of internet subsidy programs, there is a potential opportunity for the state to conduct awareness efforts or increase support for enrollment in assistance programs.

[57] Survey of Montana residents conducted by MBO Sep-Oct 2022. N=1,622

- Full first question: "Are you aware of any internet subsidy programs, such as the Affordable Connectivity Plan or the Emergency Broadband Benefit that helps cover monthly internet costs for qualifying households?"
- Second question only included respondents who know about internet subsidy programs, but have not signed up.
- "Not Interested" includes "I don't want/need it," "I am financially stable and can afford service without it," "I haven't pursued it," "I am going to apply," and "Internet service isn't expensive."
- "Application Issues" includes "It is too difficult to apply," "I don't know how to apply," "I applied and was rejected," and "I am not sure if I am eligible."
- "Missing Service Availability" includes "There is no Internet Service Provider in my Area," and "My Internet Service Provider Does not Participate in the Program."
- "Not Eligible" includes "I am not eligible."

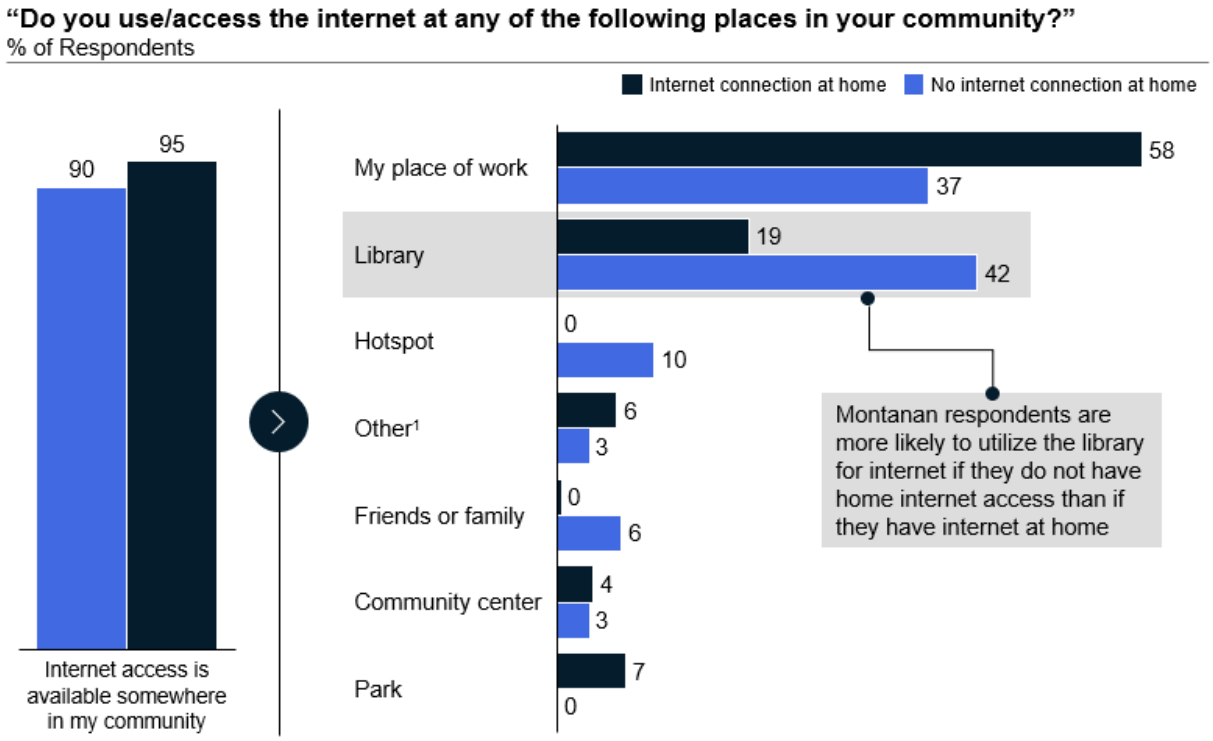
3.4.4 Broadband Access

3.4.4.1 Public Wi-Fi and public access points

This section answers the question: what forms of internet access are publicly available to Montanans?

As Exhibit 37 below shows, currently Montanans who do not have home internet access often find alternate avenues for getting online, especially relying on their work, personal hotspots, and libraries to get connected. Forty-two percent of Montanans with no internet access at home use libraries for internet access, while 37 percent rely on internet access at work:

Exhibit 37: Montanans' internet usage by alternative avenue[58]

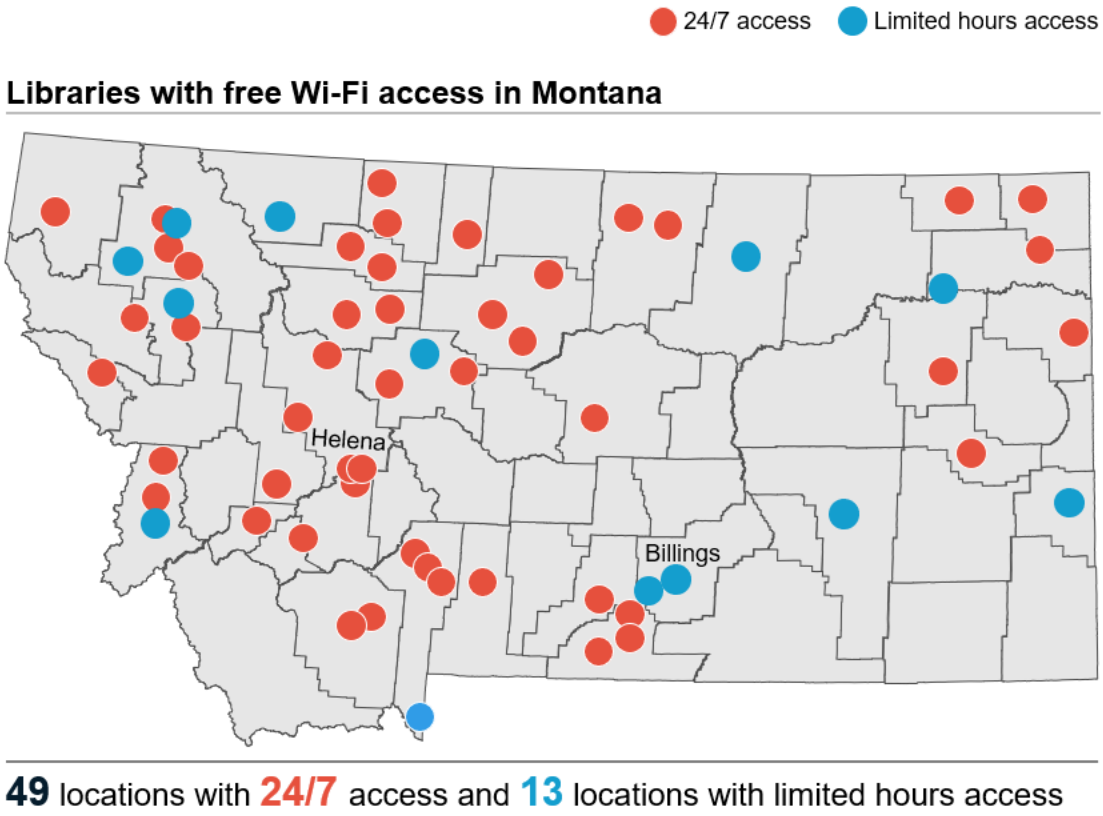


As Exhibit 38 below shows, Libraries function as CAIs, providing the main source of public Wi-Fi access in Montana, with community centers (indeterminate number) offering some additional public Wi-Fi. While some urban and semi-urban locations are served by libraries with internet

[58] Survey of Montana residents conducted by MBO Sep-Oct 2022. N=1,622. "Some kind of access" includes respondents who access the internet from at least one avenue, e.g., work, coffee shop, library, hotspot, friends/family, community center, park, church, airport, etc.

access, many counties have no libraries with internet access or only libraries with limited hours access.

Exhibit 38: Internet access at libraries in Montana[59]



3.4.4.2 Cellular connectivity

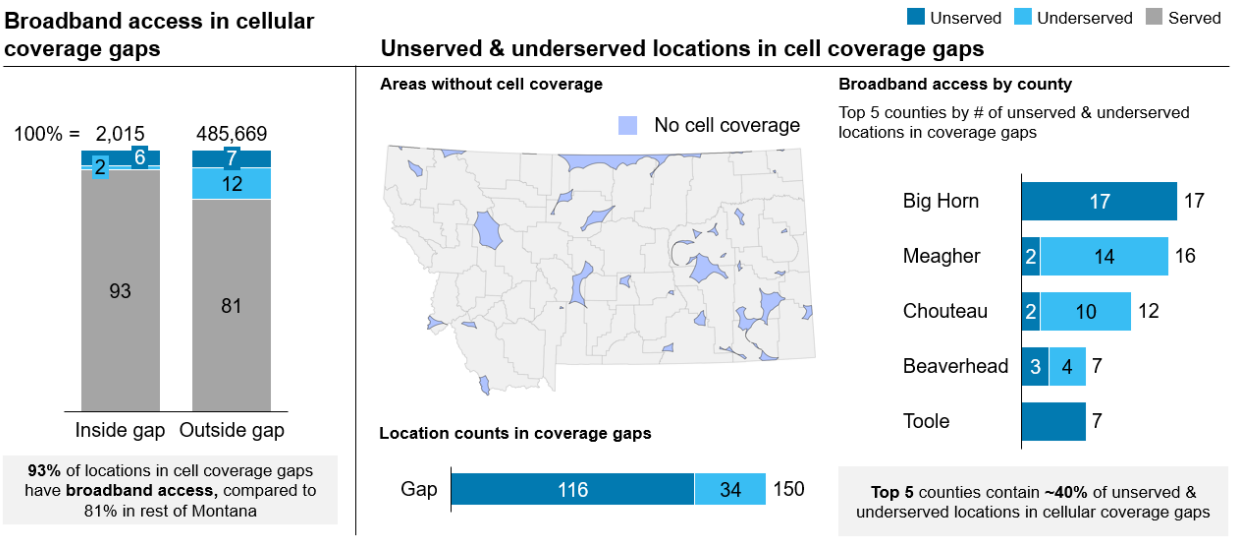
This section answers the question: what level of cellular connectivity is available to Montanans?

Cellular data coverage is present in some areas across Montana, but it is not comprehensive. The lack of reliable access to cellular connectivity presents a serious public safety risk. In many areas of the state, the lack of cellular connectivity means Montanans are unable to seek help or call 911 in the event of an emergency. Even when driving on major highways across the state, cellular connectivity may be unavailable for significant portions of the trip, which poses a high risk for

[59] State of Montana, ArcGIS layer, https://montana.maps.arcgis.com/apps/instant/nearby/index.html?appid=a733846b0bdd4e44a1f36aff4f89b411

travelers in the event of car trouble or accidents. Cellular data is least prevalent in remote areas of the state, which may be considered for alternative technologies.

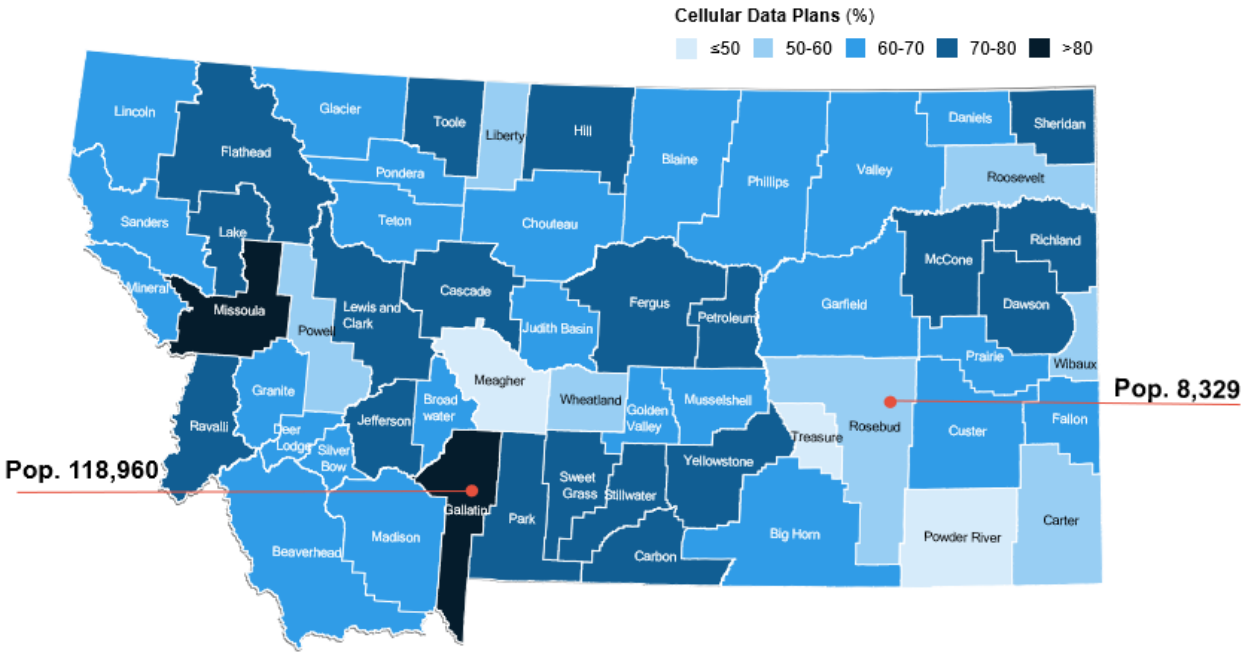
Exhibit 39: Cellular coverage versus broadband service availability in Montana[60]



As the map above indicates, there are areas of the state with no cellular data coverage at all, posing difficulties for both residents and tourists seeking to access the internet. In fact, a number of residents in many Montana counties do not use cellular data to access the internet. Only two counties have above an 80 percent adoption rate, Gallatin County, where Bozeman is located, and Missoula County, where Billings is located, as indicated in Exhibit 40:

[60] Service availability data provided by FCC Broadband Map as of November 18, 2022. Cost data provided by BroadbandLab licensed data provider as of November 18, 2022

Exhibit 40: Household cellular broadband adoption by county[61]



These two factors are interrelated: where cellular data coverage is non-existent or spotty, residents have no incentive to subscribe to cellular data plans. Consistent broadband coverage will thus be crucial in supplementing cellular coverage across the state.

3.4.5 Digital Opportunity

3.4.5.1 Increased workforce development training and employment services related to broadband deployment and adoption

This section answers the question: to what extent will Montana require increased workforce development training and employment services in order to implement its plans with respect to broadband deployment and adoption?

The implementation of this Five-Year Action Plan will require skilled labor and provide new job opportunities, as the State of Montana builds out its broadband infrastructure and works toward closing the digital divide. This aligns with Montana's goals as outlined in the Workforce Innovation and Opportunity Act (WIOA) State Plan, "provide opportunities for its current and future workforce and businesses to sustain economic viability through partnerships and collaboration." The State of Montana can pursue partnerships to ensure that the Digital

[61] US Census data 2021 5-Year Estimates, https://data.census.gov/table?q=C17002&g=040XX00US30$0500000,30&tid=ACSDT5Y2021.C17002

Opportunity Plan's programmatic efforts support the development of a skilled labor pool that helps close the labor gap needed for broadband deployment and service.

The implementation of both the BEAD and Digital Opportunity Plans will create jobs to build and support broadband infrastructure and supporting programs, which may incentivize Montanans to return to live and work in the state, helping to fill labor gaps needed for broadband deployment and ongoing implementation. This dovetails with the administration's efforts via Come Home Montana to encourage Montanans to take advantage of remote work opportunities and return home to Montana from other states.

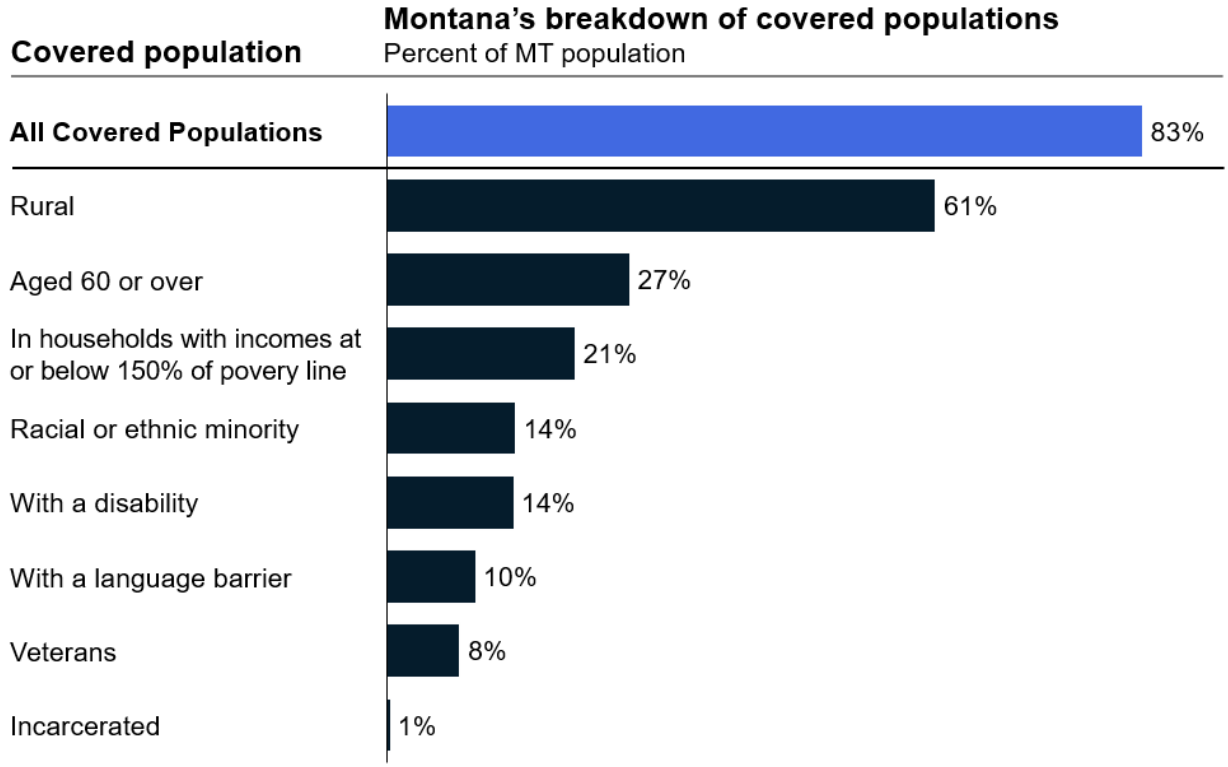
3.4.5.2 Increased participation in the digital economy by communities traditionally disengaged

This section answers the question: what barriers to broadband adoption exist for Covered populations and communities traditionally disengaged?

The State of Montana seeks to prioritize improving broadband adoption for the Covered populations outlined in the BEAD guidance.

Covered populations make up 83.3 percent of Montana's population, with individuals who primarily reside in a rural area accounting for nearly two-thirds of the state's citizens. The elderly constitute the second largest covered population at 27 percent, and households with incomes at or below 150 percent of the poverty line make up 21 percent of the state's population. See *Exhibit 41* below for details.

Exhibit 41: Montana's breakdown of Covered populations[62]

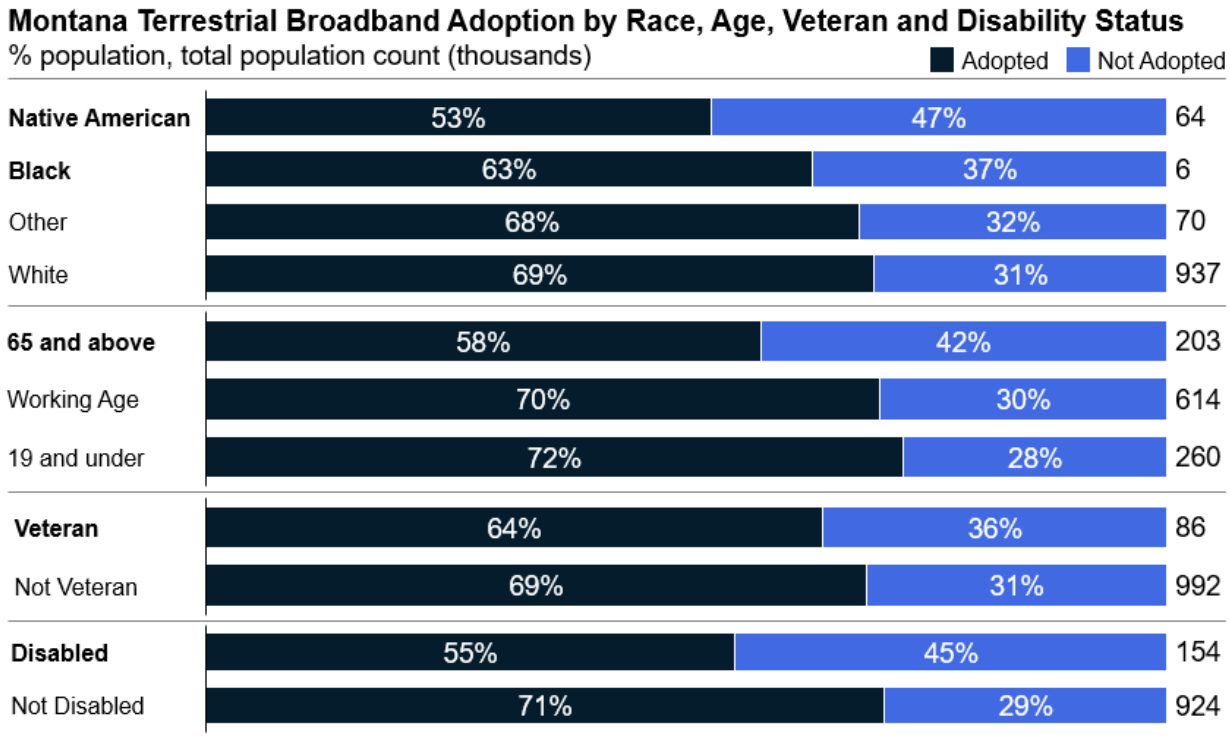


Covered populations in the State of Montana face several barriers to digital opportunity, including broadband availability, affordability of service, lack of access to devices, and limited digital skills.

A relationship exists between an individual's status as a member of a covered population and their broadband adoption. Covered populations—including ethnic and racial minorities, aging individuals, veterans, and individuals with disabilities—have lower rates of broadband adoption than their counterparts. The divide in adoption is particularly pronounced for racial and ethnic minorities, elderly individuals, and individuals with disabilities.

[62] Digital Opportunity Act Population Viewer https://mtgis-portal.geo.census.gov/arcgis/apps/MapSeries/index.html?appid=a0013a9dcbb9419e855f563d78e892ef

Exhibit 42: Montana Terrestrial Broadband Adoption by Race, Age, Veteran and Disability Status[63]



Broadband Availability

As the fourth largest state in the country, Montana extends across nearly 150,000 square miles. In terms of total population, Montana comes in 44th, with just over one million residents.[64] This low population density, coupled with topographic hurdles like vast plains and long ranges of the Rocky Mountains, poses challenges to establishing broadband infrastructure, leaving many Montanans without access to adequate internet speeds. According to a survey (n=1,622), 73.8 percent of Montanans cited lack of availability as the primary reason that they don't have high-speed internet.[65]

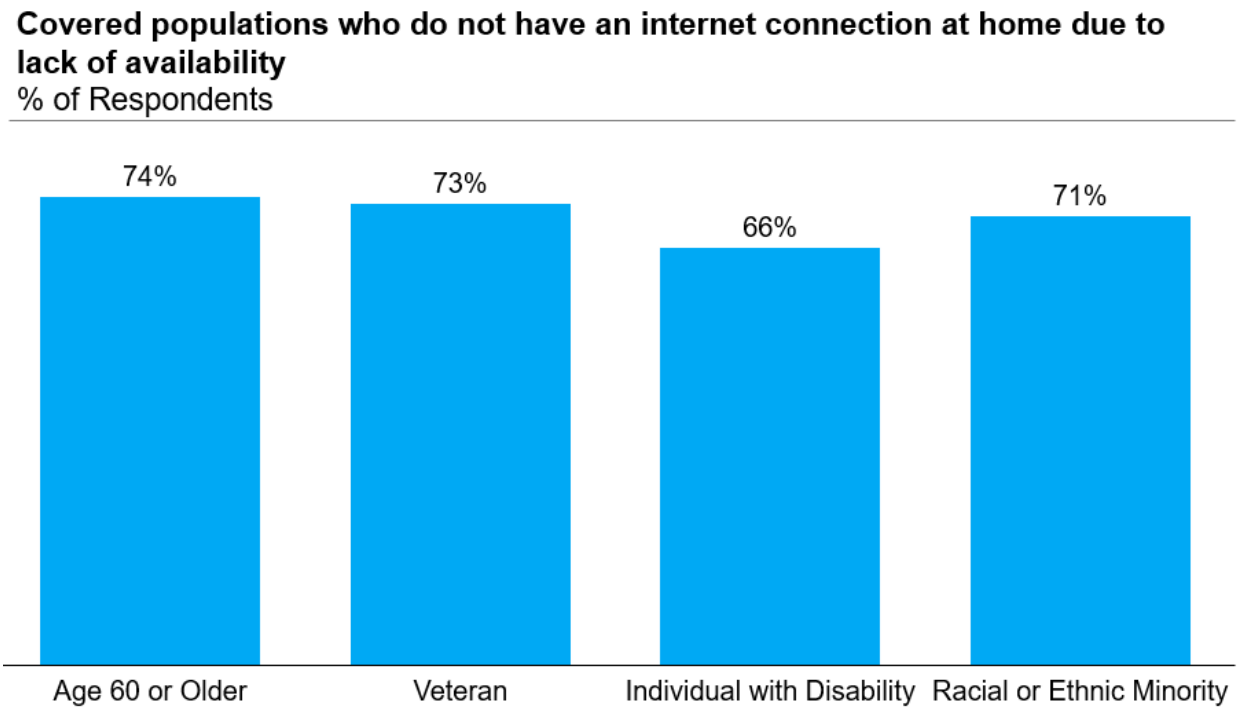
Montana's two geographic regions, the Great Plains and Rocky Mountains, pose distinct challenges, potentially leading to a higher cost to deploy broadband. The Great Plains are glaciated, frequently freezing in the winter, and sparsely populated; the Rockies feature high elevation and mountains in which it will be challenging and expensive, if not impossible, to lay fiber optic cable. The eastern part of the state suffers from some of the lowest accessibility to and

[63] U.S. Census Bureau, American Communities Survey (ACS), 2021; includes DC; https://data.census.gov/table?q=internet&g=040XX00US30&tid=ACSST5Y2021.S2801
[64] United States Census Bureau estimates as of 01 July 2021: Land area and Population https://www.census.gov/quickfacts/MT
[65] Survey of Montana residents conducted by MBO Sep-Oct 2022. N=1,622

adoption of high-speed internet, due to the challenges of the Great Plains region. This area is remote and sparsely populated, and as a result, it lacks adequate broadband infrastructure.

Montana's covered populations are impacted by limited availability. A recent survey commissioned by the Montana Broadband Office indicates that among covered populations who do not have an internet connection at-home, lack of availability is the most common cause (see Exhibit 43 below).

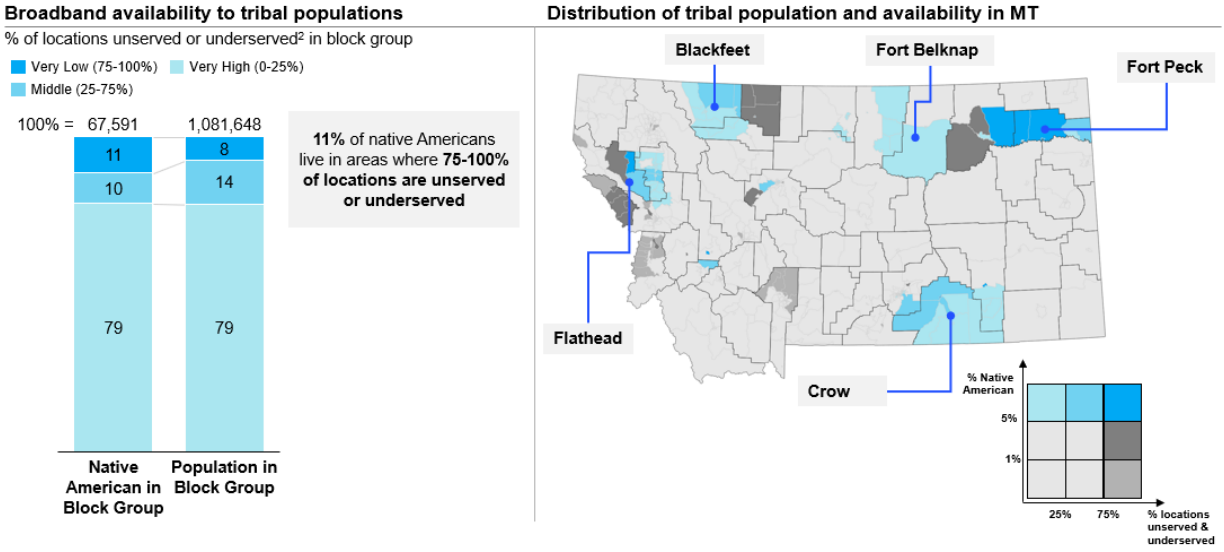
Exhibit 43: Internet availability for covered populations[66]



As shown in *Exhibit 44*, Native Americans are especially impacted by the lack of availability. 11 percent of Native Americans live in census block groups with very low service availability (<25 percent of locations served) compared to eight percent of the total population. This is most prevalent in the Blackfeet, Flathead, Crow, Fort Peck and Fort Belknap areas.

[66] Survey of Montana residents conducted by MBO Sep-Oct 2022. N=1,622. Note: Throughout this survey, some covered populations' respondents belong to more than one covered population (e.g., respondent is age 60 or older and a veteran) and non-Native English speakers were not included due to small sample size

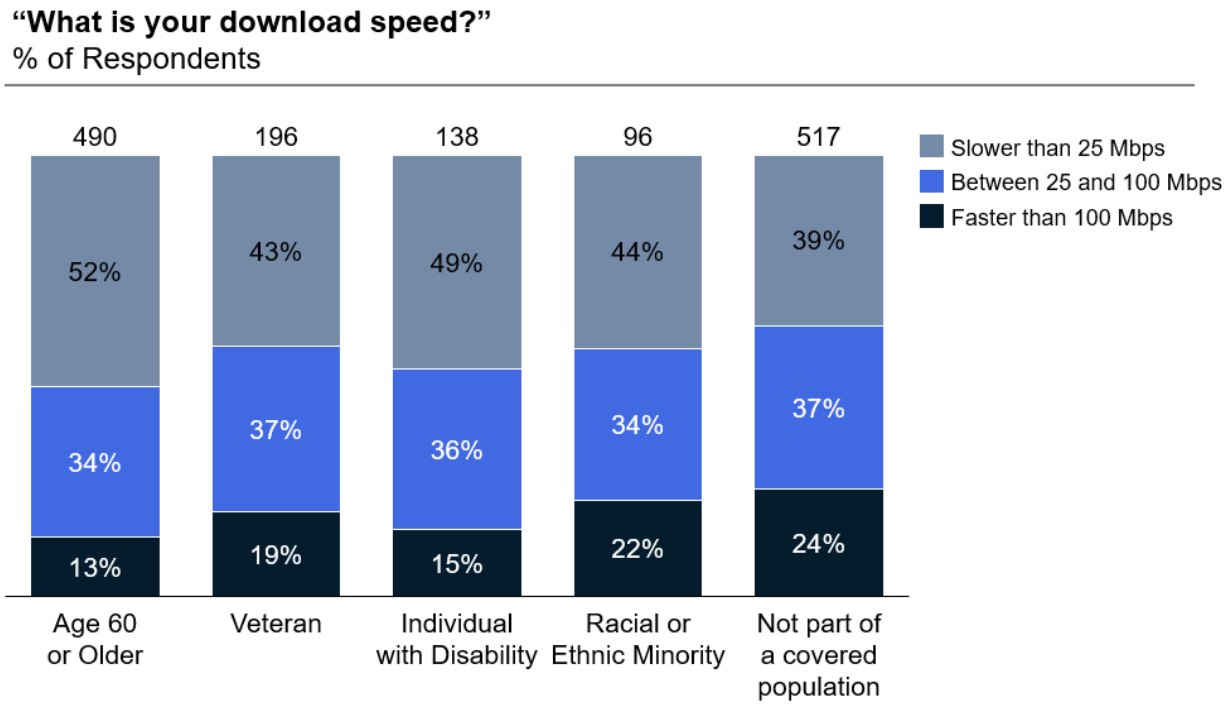
Exhibit 44: Broadband availability for Native Americans in Montana[67]



As a result of low broadband availability, compounded by other barriers, Covered populations are unserved at higher rates than their counterparts, as a survey commissioned by the Montana Broadband Office shows more prevalence of download speeds slower than 25 Mbps—with aging individuals at 52 percent, veterans at 43 percent, individuals with disabilities at 49 percent, and racial or ethnic minorities at 44 percent—than non-covered populations at 39 percent (see *Exhibit 45* below). The same is true for upload speeds below three Mbps—with aging individuals at 32 percent, individuals with disabilities at 30 percent, veterans at 26 percent, and racial or ethnic minorities at 35 percent—compared to non-covered populations at 26 percent (see *Exhibit 46* below).

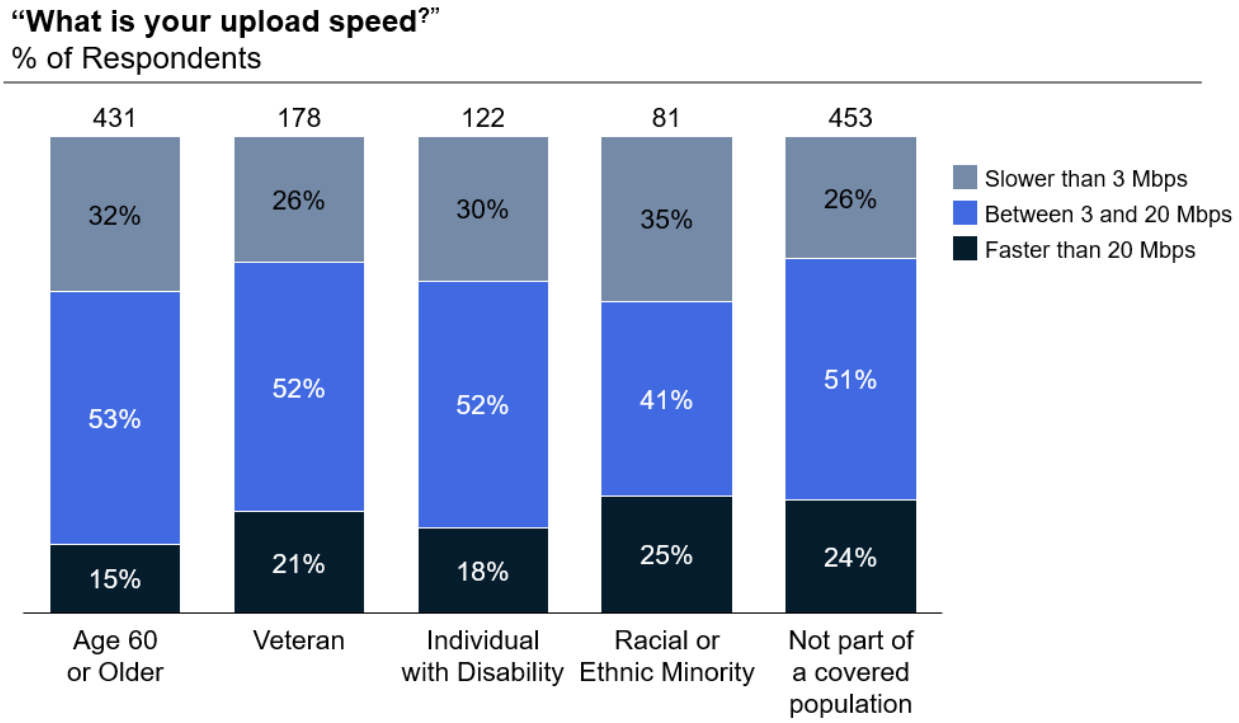
[67] Demographics -- U.S. Census ACS (2016-2020); Service availability data based on FCC Broadband Map as of 18 November 2022; Block group boundaries -- U.S. Census (2020)

Exhibit 45: Internet download speed for Covered populations[68]



[68] Survey of Montana residents conducted by MBO Sep-Oct 2022. N=1,622. Note: Some covered populations' respondents belong to more than one covered population (e.g., respondent is age 60 or older and a veteran) and non-Native English speakers were not included due to small sample size. Excluded those who skipped answering and answered "I don't know"

Exhibit 46: Internet upload speed for covered populations[69]



The Digital Opportunity Plan and this Five-Year Action Plan's forthcoming efforts to increase broadband availability, could be a key component to getting high-speed internet to covered populations.

Access to Devices

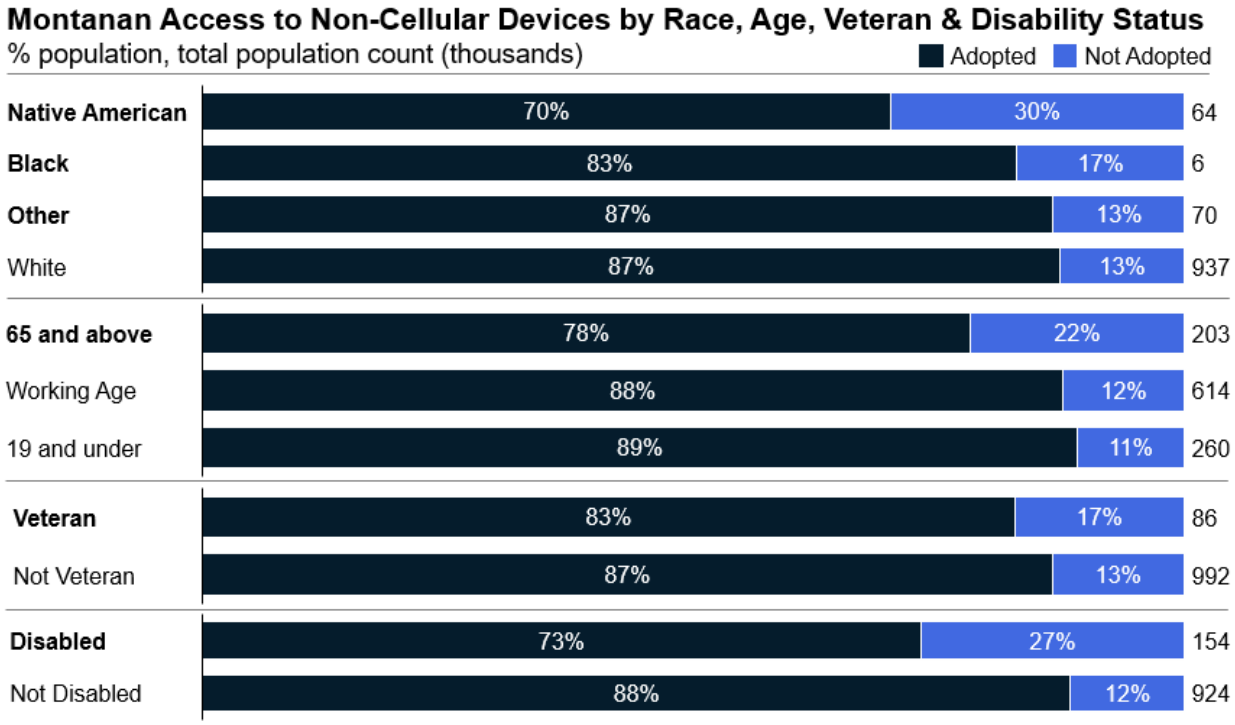
Individuals who are members of covered copulations also have lower rates of access to internet-capable devices than their counterparts. In the absence of these devices, these individuals are unable to access the internet and its resources at home or on the go.

As illustrated in Exhibit 47, the divide in device access is particularly pronounced for Native Americans, aging individuals, veterans, and individuals with disabilities.

Individuals with disabilities face a number of hurdles related to device access, as many need specialized equipment that requires training, which is not readily available in much of Montana.

[69] Survey of Montana residents conducted by MBO Sep-Oct 2022. N=1,622. Note: Some Covered Populations' respondents belong to more than one Covered Population (e.g., respondent is age 60 or older and a veteran) and non-Native English speakers were not included due to small sample size. Excluded those who skipped answering and answered "I don't know"

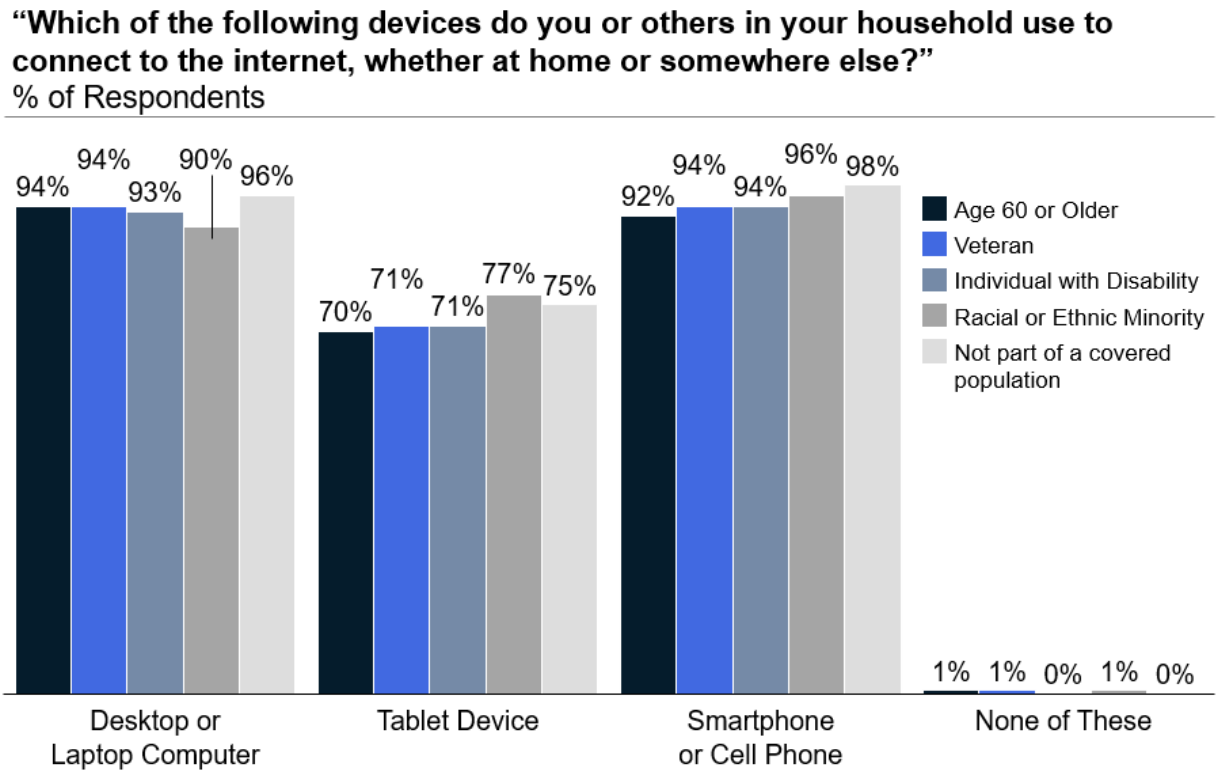
Exhibit 47: Montanans' access to internet-capable devices[70]



The Montana Broadband Office survey shows that covered populations use smartphones or cell phones to connect to the internet at lower rates than non-covered populations (see *Exhibit 48*). The divide is most notable among those 60 and older (92 percent) compared to veterans and individuals with disabilities (94 percent), racial or ethnic minorities (96 percent), and non-covered populations (98 percent). Racial or ethnic minorities use desktops or laptop computers less frequently than their counterparts. However, they do report higher use of tablet devices (77 percent) than non-covered populations (75 percent). Just 70 percent of seniors report using tablets, which, if adopted, may be a useful, user-friendly option. According to Philadelphia's Digital Opportunity Plan, "While everyone should have access to a mobile phone, healthcare providers and elder care advocates suggest that a tablet, for its simplicity of use, may be a better option to meet the needs of seniors to connect with their healthcare provider or their families."[71]

[70] U.S. Census Bureau, American Communities Survey (ACS), 2021 5-Year Estimates; includes DC; https://data.census.gov/table?q=internet&g=040XX00US30&tid=ACSST5Y2021.S2801
[71] "A Digital Opportunity Plan for the City of Philadelphia," January 2022

Exhibit 48: Access to specific internet-enabled devices[72]



To take full advantage of the internet, individuals need easy access from home on devices which they are familiar with and comfortable using. Encouraging adoption and use of internet-capable devices could be critical to broadening Montana's meaningful use of broadband.

Digital Skills

Survey data and anecdotal accounts from interviews with state agencies suggests that many Montanans are lacking the critical digital skills necessary to bridge the digital divide, which contributes to low rates of broadband adoption.

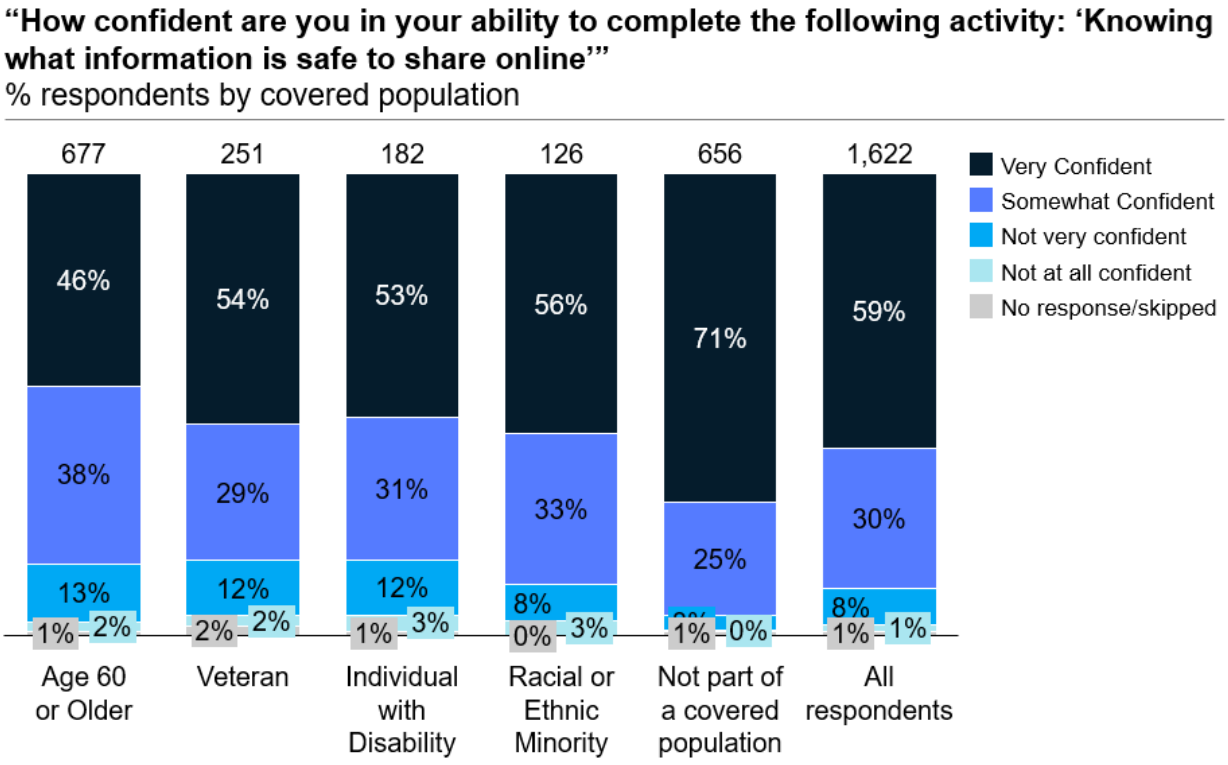
Limited digital skills is a considerable challenge for elderly individuals and veterans. According to the Department of Military Affairs, many veterans "lack technological abilities and access, especially in rural, smaller areas," and "digital literacy is particularly challenging for the older folks."

One survey conducted by the MBO as part of the BEAD stakeholder engagement process[73] showed that covered populations—particularly aging individuals, veterans, and individuals with disabilities—were less confident in their ability to know what information is safe to share online, indicating limited digital skills. Non-covered populations are 25 percent more likely to be very

[72] Survey of Montana residents conducted by MBO Sep-Oct 2022. N=1,622
[73] Survey of Montana residents conducted by MBO Sep-Oct 2022. N=1,622

comfortable deciphering what information is safe to share online than those 60 and older and at least 15 percent more likely when compared with every other covered population (see Exhibit 49)

Exhibit 49: Montanans' confidence in sharing information online[74]



In one survey question posed to people without home internet, ten percent of veterans responded that they lacked broadband because they "don't know how to use the internet," compared to zero percent of non-covered populations.[75]

The absence of robust digital skills training programs in the state may also contribute to inadequate digital skills and an unfamiliarity with the internet.

Further, more concerted efforts may be needed to promote digital skills for individuals with disabilities, some of whom require specialized devices and tailored training to learn to use the equipment. The Montana School for the Deaf and Blind's director noted that visually impaired students require software that reads screens aloud to tell them where their cursors are, and those who are deaf or hard of hearing rely on programs that provide closed captions to follow along during virtual classes.[76] This equipment can be quite costly and finding instructors who are qualified to provide the necessary training is a challenge in the sparsely populated state.

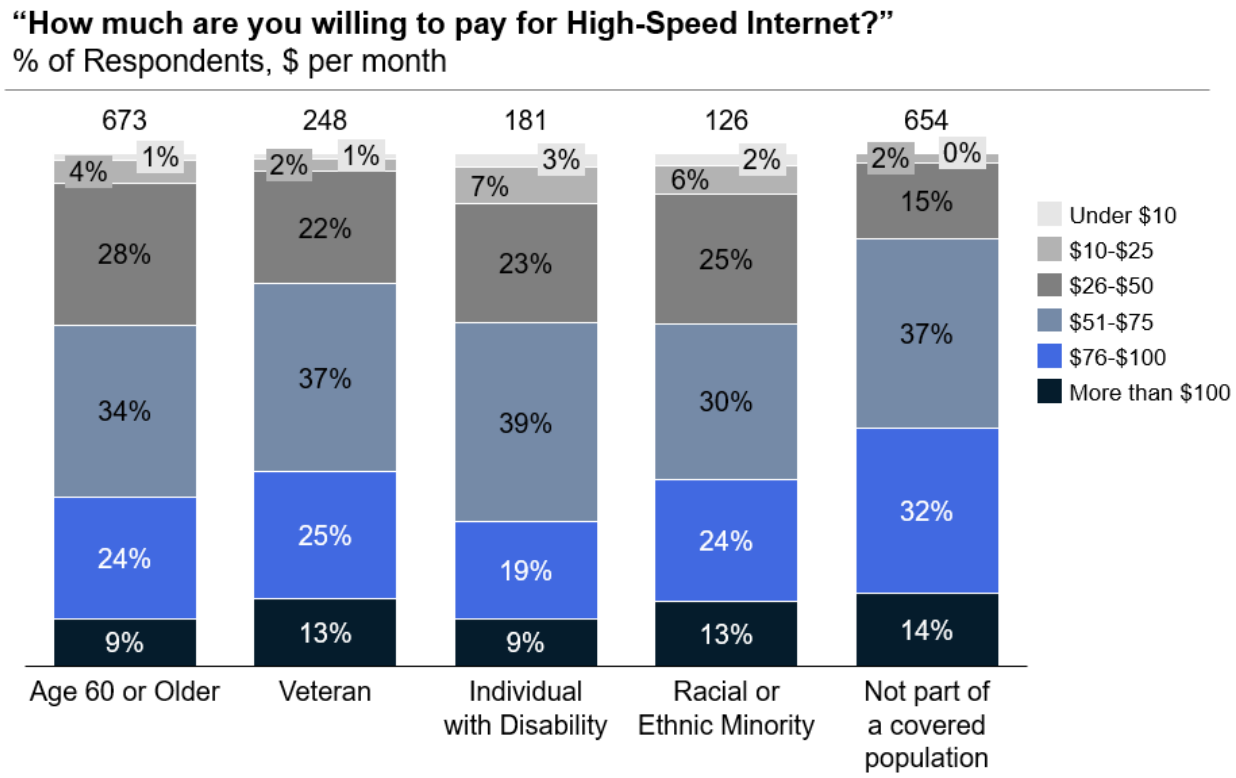
[74] Survey of Montana residents conducted by MBO Sep-Oct 2022. N=1,622
[75] Survey of Montana residents conducted by MBO Sep-Oct 2022. N=1,622
[76] Interview, Paul Furthmyre, Director of the Montana School for the Deaf and Blind

Individuals with disabilities may need easier and more readily available access to specialized training to develop the skills needed for meaningful digital use.

Affordability

While affordability is an obstacle to high-speed internet access, a survey indicates that most Montanans are willing to pay more than $50 per month for internet. However, there is a gap in willingness to pay between covered and non-covered populations: 83 percent of non-covered populations are willing to pay more than $50, compared to 67 percent of those with disabilities, racial or ethnic minorities, and the elderly, and no more than 75 percent of veterans (see Exhibit 50).

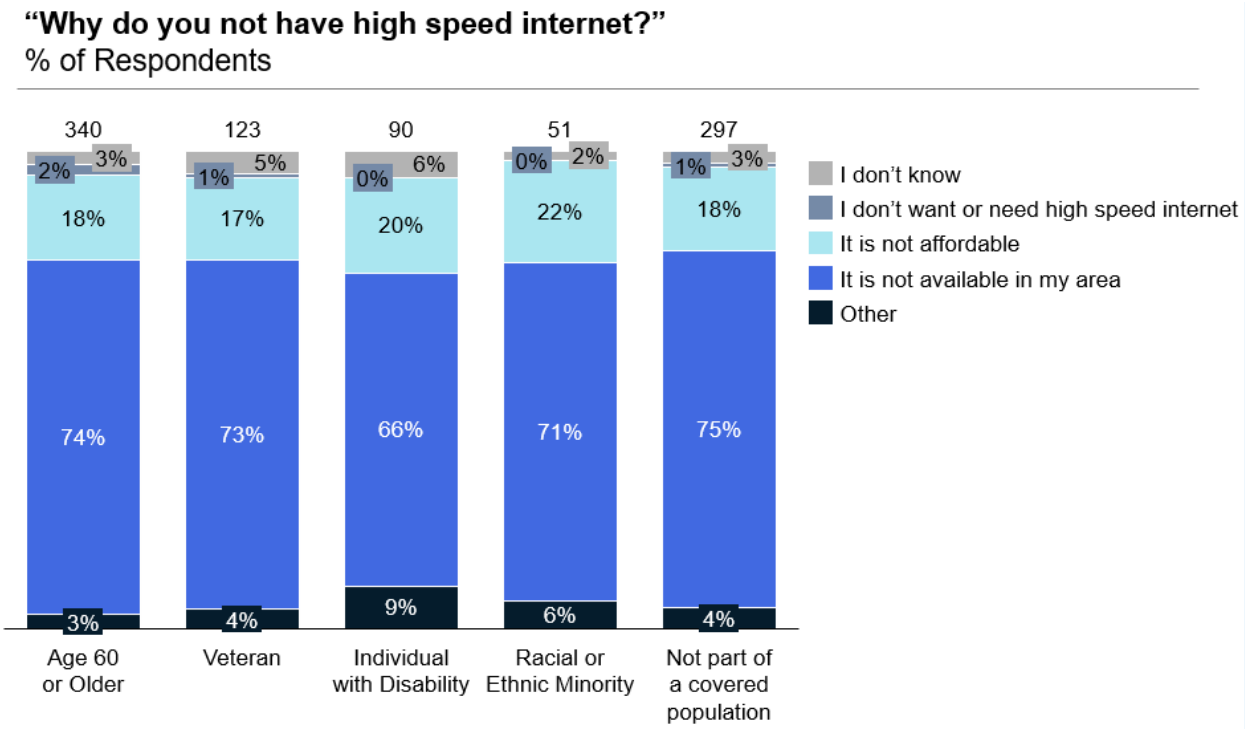
Exhibit 50: Montanans' willingness to pay for high-speed internet[77]



Survey data shows that across covered populations, lack of affordability is a primary reason for their lack of high-speed internet. Eighteen percent of survey respondents age 60 and older report that internet is unaffordable, 22 percent of racial or ethnic minorities, 20 percent of individuals with disabilities, and 17 percent of veterans. Eighteen percent of non-covered populations cite lack of affordability as the main reason for their inadequate broadband access (see Exhibit 51).

[77] Survey of Montana residents conducted by MBO Sep-Oct 2022. N=1,622

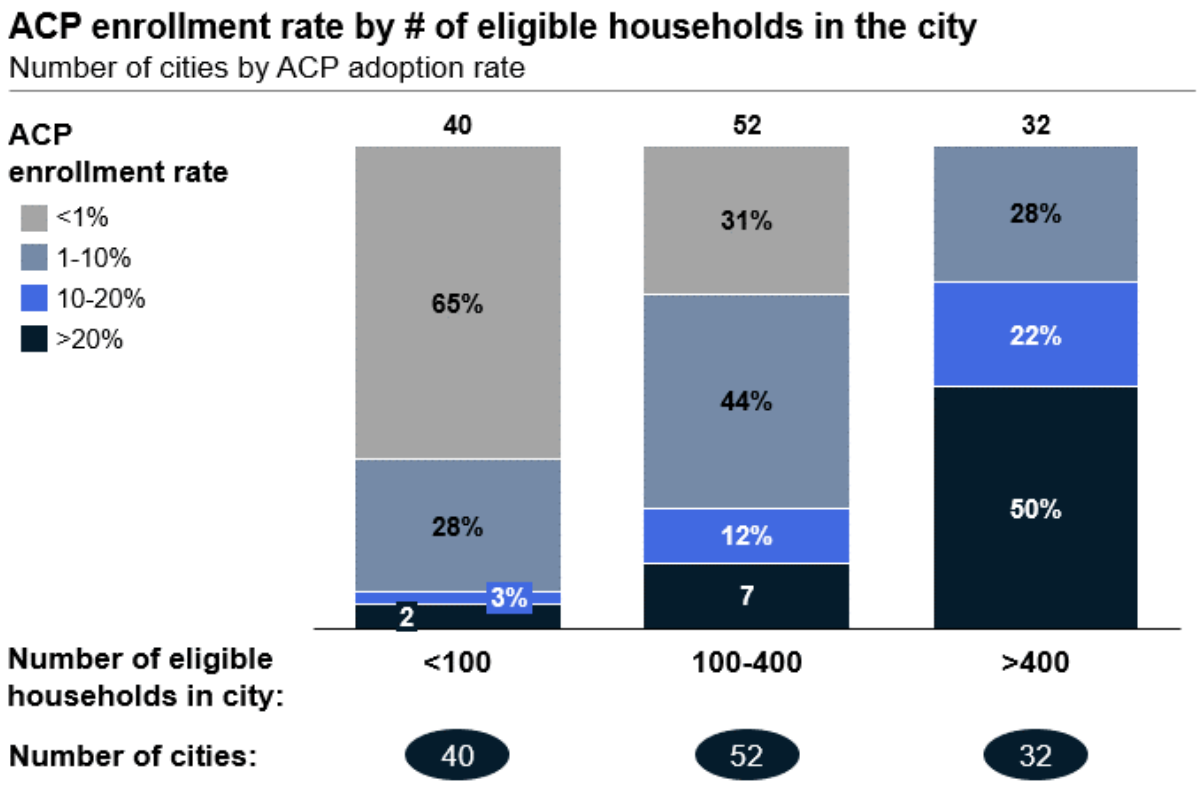
Exhibit 51: Reasons Montanans do not have high-speed internet [78]



ACP adoption may be a key strategy to help address the affordability gap for Montanans. ACP uptake is minimal in rural areas, while more populous areas also have room for growth. Cities with fewer households (<400) that are eligible for ACP tend to have lower adoption rates, as only 9 percent of these cities have an adoption rate greater than 20 percent. Most cities with fewer than 100 eligible households have less than one percent ACP adoption. Densely populated cities (>400 eligible households) are more likely to have higher ACP adoption rates (see Exhibit 52).

[78] Survey of Montana residents conducted by MBO Sep-Oct 2022. N=1,622

Exhibit 52: ACP enrollment rates by number of eligible households in city[79]



To overcome affordability barriers, Montana may consider encouraging the availability of low-cost plans and promoting the adoption of the ACP.

3.4.5.3 Resources to support digital opportunity (i.e., organizations and/or funding for Digital Navigators)

While there are organizations across the State of Montana working to support digital opportunity, these efforts are relatively small scale. One such example has been provided below. A key focus of the Digital Opportunity Plan will be to increase engagement with such organizations to help close the digital divide. This gap in support of digital opportunity can be filled through the Digital Opportunity Plan's strategies referenced in Section 5.1.

Organization Name	Asset Name	Description	Covered Population	Link
Community Skills Initiative by Montana	Community Skills Initiative	This free program helps job seekers successfully navigate the paths to in-demand roles	All	https://www.communityskilling.org/partner/montana

[79] Educationsuperhighway.org (PUMS, USAC), https://www.educationsuperhighway.org/no-home-left-offline/acp-data/

Organization Name	Asset Name	Description	Covered Population	Link
Chamber Foundation		in a more digital economy by promoting digital skills and employability.		

3.4.5.4 Engagement with community-based organizations, CAIs, digital opportunity coalitions, state agencies, local community champions, tribal leaders, and federal landowner

More details on the state's engagement with stakeholders are listed in Section 5.1: Stakeholder Engagement Process below. With the establishment of the Montana Broadband Office and the strategies laid out in the Digital Opportunity Plan, the state will take a more active role in coordination with various organizations and agencies to achieve its goals of closing the digital divide.

4 Obstacles or Barriers

This section answers the question: what obstacles has Montana identified as barriers it may encounter as it implements the BEAD program, and how does it plan to mitigate them?

4.1 Topography

Overview

Montana's two distinct geographic regions, the Great Plains and Rocky Mountains, pose distinct challenges, potentially leading to a higher cost to deploy broadband. The Great Plains, covering the eastern three-fifths of the state, are glaciated, frequently freezing in the winter, and sparsely populated; the Rockies, covering the western two-fifths of the state, feature high elevation and mountains in which it will be challenging and expensive, if not impossible, to lay fiber optic cable. Montana's geography encompasses mountains, canyons, forests, grassy plains, and badlands—all of which pose unique challenges for broadband deployment.

Mitigation:

MBO will prioritize access to fiber wherever technically and economically feasible. However, given the geographic challenges noted above, MBO plans to use a mix of different technologies to cover challenging territory, based on the Extremely High-Cost per Location Threshold that will be defined by Montana's location-level analysis. For instance, Fixed wireless access (FWA) uses wireless technology over cellular/mm Wave spectrum rather than "last mile" wire. While fiber and fixed wireless costs are comparable in the longer run, initial installation costs for fixed wireless are often cheaper. Satellite internet may also be a viable option in the most remote corners of the state. New low-Earth-orbit satellites, which orbit 500 to 2,000 kilometers from Earth, offer faster communications (they have lower latency) and often provide higher bandwidth per user than that provided by geosynchronous satellites.[80]

4.2 Population density

Overview

Montana is the US's fourth largest state by land area but 44th by population, which yields a population density of only 7.4 people per square mile.[81] This poses additional challenges to building out broadband access for remote locations in a cost-effective fashion, since many of them are so far removed from each other. Where locations cannot be served in a cost-effective fashion with fiber optic cable, MBO has proposed other alternatives.

Mitigation

MBO plans to use a mix of different technologies to cover sparsely populated territory, to ensure that even far-flung locations can be reached in a cost-effective fashion. MBO considers that the

[80] Chris Daehnick, Isabelle Klinghoffer, Ben Maritz, and Bill Wiseman, "Large LEO satellite constellations: Will it be different this time?", https://www.mckinsey.com/industries/aerospace-and-defense/our-insights/large-leo-satellite-constellations-will-it-be-different-this-time

[81] United States Census Bureau estimates as of 01 July 2021: Land area; Population

impetus for federal grant funding is precisely to make broadband deployment possible in areas where the cost of construction is too high for ISPs without the help of grants. Given the importance of broadband deployment in the economic development of rural areas, Montana continues to prioritize broadband deployment even in sparsely populated parts of the state.

4.3 Legislative context

Montana has a number of administrative rules relevant to broadband deployment, listed below:

4.3.1 Right-of-way legislation

See Section 3.4.1.5 Legislative solutions to accelerate infrastructure deployment for more information on right-of-way legislation.

4.3.2 Municipal broadband legislation

Overview

Montana State laws only allow municipalities to offer broadband services if there are no other private companies offering broadband within the municipality's jurisdiction, or if the municipality can offer "advanced services" that are not available from incumbents. For municipalities that are currently offering broadband service, local authorities must alert their subscribers if a private company decides to enter the market. HB422, aiming to repeal this restriction, failed in 2021. In other states, municipal broadband appears to be most successful in densely populated areas, e.g., cities; it is generally not observed on a statewide level.[82]

Mitigation

The State of Montana currently allows non-profit organizations to serve as broadband providers. Moving forward, the state will ensure that no classes of applicants (e.g., local governments, public-private partnerships) are excluded from applying for funding, in line with BEAD requirements.

4.4 Labor gap

Overview

A high level of labor shortage is anticipated for broadband-related roles in Montana, especially in outdoor, labor-intense roles. Labor shortages may lead to delayed deployment as well as higher cost than anticipated if labor has to be sourced across state lines to address gaps. For details on anticipated shortages of specific roles, see Section 3.4.1.7: Increased workforce available to deploy broadband.[83]

Mitigation

The implementation of both the BEAD and Digital Opportunity Plans will create jobs to build and support broadband infrastructure and supporting programs, dovetailing with the administration's efforts via Come Home Montana to encourage Montanans to relocate back to

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[82] *Broadband Now,* "Municipal Broadband 2022," https://broadbandnow.com/report/municipal-broadband-roadblocks/#montana
[83] Bruce Forey, "Fiber Broadband Industry Faces Material and Labor Shortages," *BroadbandCommunites,* https://www.bbcmag.com/community-broadband/fiber-broadband-industry-faces-material-and-labor-shortages

the state for these newly created jobs. There may also be an opportunity to mitigate this barrier by coordinating across states on implementation timelines and encouraging existing workers in these fields to relocate to Montana. Several national programs target the labor gap in broadband deployment. In 2020, the Telecommunications Industry Registered Apprenticeship Program, a joint venture of telecommunications companies and industry associations, reported that there were more than 3,600 registered apprentices in telecommunications occupations.[84] The Fiber Broadband Association has also launched a fiber installation certificate in North Carolina that it hopes to eventually bring to other states.[85] Montana will draw on learnings from those programs where possible.

MBO will also coordinate with the Department of Labor and Industry to align workforce development programs with the upcoming labor needs for broadband deployment. Governor Gianforte has prioritized growing the Montana Registered Apprenticeship Program, which has greatly accelerated over the last year and currently has more participants than the previous three years combined.[86] The program provides paid, on-the-job training that teaches specific and technical job skills unique to the employer's profession, and upon completion, participants receive a Montana Registered Apprenticeship Program[87] completion certificate, which is recognized in all 50 states.

The program was designed to create a skilled labor force to take advantage of Montana's employment opportunities. Annually in Montana, around 14,000 students graduate from high school, 6,000 of whom go directly to work without meaningful credentials that could help them secure skilled, well-paying positions. In an effort to support those students, the state developed Montana Registered Apprenticeships, which pairs students with employers, provides them paid, on-the-job training, and positions them to obtain gainful employment. This effort is reimagining high school for nontraditional students who would likely not attend college upon graduation. Pilot programs have been developed for construction, manufacturing, healthcare, technology, restaurants, and hospitality.

Given the expected shortfall in broadband deployment roles (including construction), the Montana Broadband Office will explore opportunities for students to participate in apprenticeships that allow them to learn how to deploy broadband infrastructure and provide ongoing technical support as high-speed internet is expanded throughout Montana in accordance with the BEAD and Digital Opportunity Plans.

4.5 Supply chain issues

Overview:

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[84] Bruce Forey, "Fiber Broadband Industry Faces Material and Labor Shortages," *BroadbandCommunites,* https://www.bbcmag.com/community-broadband/fiber-broadband-industry-faces-material-and-labor-shortages
[85] Diana Goovaerts, "AT&T, Corning tackle labor shortage with new fiber training program," Fierce Telecom, https://www.fiercetelecom.com/telecom/att-corning-tackle-labor-shortage-new-fiber-training-program
[86] Discussions with Workforce Development at the Department of Labor & Industry. October 31, 2022
[87] https://apprenticeship.mt.gov/

The Fiber Broadband Association provides current lead times for components needed for fiber deployment. As of September 2022, the Fiber Broadband Association reported lead times of 52-60 weeks for fiber optic cable, 10-20 weeks for fiber cabinets and splitters, 20-35 weeks for fiber multiport terminals, 15-20 weeks for conduit, and 22-26 weeks for hand holes.[88]

BEAD provisions prohibit subgrantees from using the funding to purchase fiber optic cable from China and does not allow providers to purchase optical transmission equipment made in China. This means that providers are more likely to use equipment manufactured in the US or potentially Japan. In 2021, US fiber manufacturers Corning, Prysiam, CommScope, and Sterlite announced some $275 million in investment. IBIS Worlds estimates that annual US fiber optic manufacturing will be roughly $2 billion in 2022.[89]

However, US producers of fiber optic cables may face shortages in key materials, e.g., helium and silicon tetrachloride, which could in turn impact the timeline of fiber optic cable deployment. These shortages could delay procurement and lead to higher costs (+70 percent compared to March 2021).[90] Globally, total cable consumption increased by 8.1 percent in the first half of 2022 compared with the same time in 2021, according to estimates by the market intelligence group Cru.[91] China accounted for 46 percent of the total, with North America representing the fastest growing region, at 15 percent year on year.[92] Spot prices for fiber optic cable are increasing in every market.

The shortage of helium has been caused in part by plant outages in Russia and the US, causing prices of the element to increase by 135 percent over the past two years. In the US, a Texas-based federal helium reserve has been dwindling. A new helium-production facility in eastern Russia was supposed to supply nearly one-third of the world's helium, but a fire in January of 2021 delayed its opening, and the war in Ukraine has also resulted in trade restrictions as part of the sanctions package. The element has many other applications, including crucial health applications (e.g., its use in MRI machines), so sourcing will continue to be challenging.[93]

Prices of silicon tetrachloride, another key component in the production of fiber optic cables, have increased by up to 50 percent according to Cru.[94] China is now the dominant producer of polysilicon, a production process that produces silicon tetrachloride as a byproduct, but in June 2022 the US government banned the import of polysilicon from China's western region of Xinjiang over human rights concerns—the impact on silicon tetrachloride sourcing is unclear.[95] Silicon tetrachloride also has many other applications, including semiconductors, photovoltaic

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[88] Fiber Broadband Association, "Strategies to Mitigate Bottlenecks in the Current Fiber Broadband Supply Chain."
[89] Roslyn Layton, "US Fiber Production Is One Bright Spot In Sobering Supply Chain Report," *Forbes,* March 1, 2022, https://www.forbes.com/sites/roslynlayton/2022/03/01/us-fiber-production-is-one-bright-spot-in-sobering-supply-chain-report/
[90] Anna Gross, "Global shortage of fibre optic cable threatens digital growth," *Financial Times,* July 24, 2022
[91] Anna Gross, "Global shortage of fibre optic cable threatens digital growth."
[92] Anna Gross, "Global shortage of fibre optic cable threatens digital growth."
[93] Caroline Hopkins, "The world is running out of helium. Here's why doctors are worried," NBC News, https://www.nbcnews.com/health/health-news/helium-shortage-doctors-are-worried-running-element-threaten-mris-rcna52978
[94] Anna Gross, "Global shortage of fibre optic cable threatens digital growth."
[95] Emily Feng, "How Did China Become The World's Dominant Polysilicon Producer?", *NPR,* July 6, 2021, https://www.capradio.org/news/npr/story?storyid=1013266774

cells, and other chemical intermediates.[96] US manufacturers of fiber optic cables will thus face a competitive global market in sourcing the materials needed for broadband deployment.

According to the National Rural Broadband Association, providers are unable to obtain 30-40 percent of the needed equipment to install broadband, including fiber.[97] AT&T has also reported issues in sourcing fiber that have impacted its targets for fiber deployment.[98] Finally, if providers must switch away from just-in-time sourcing strategies towards stockpiling key materials, warehousing and inventory costs will also increase.

Mitigation:

The Fiber Broadband Association has recommended several strategies available to providers for supply chain management. These include establishing solid personal relationships with suppliers, designing buildout flexibly to allow for a degree of product substitution, diversifying suppliers, and building more robust forecasting processes.[99] The State of Montana will work closely with ISPs before and during the deployment process to provide the technical assistance required to help implement these mitigating actions. Montana has engaged engineering and technical experts who will be able to help ISPs forecast their material needs and think through alternative options in the event of shortages. The State of Montana will also work with ISPs to ensure they are reaching out to suppliers early in the process.

4.6 Industry participation

Overview

The state's broadband strategy requires participation from ISPs and other applicant classes such as local governments and public-private partnerships. Stakeholder engagement will be necessary to ensure applicants' buy-in and participation. Montana has conducted a robust stakeholder engagement process that has involved extensive coordination and input from ISPs and the public, including in public forums, focus group discussions and one on one meetings. See Section 5.1 below for a detailed description of MBO's stakeholder engagement plan.

Mitigation

MBO has conducted robust stakeholder engagement with ISPs and with the public during the planning phase. MBO will continue this engagement throughout implementation of the entire Five-Year Action Plan. The engagement will help to ensure a transparent and efficient grant process, as well as work to ensure goals are being met and any risks are addressed early in the

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[96] "Global Silicon Tetrachloride Market Outlook," https://www.expertmarketresearch.com/reports/silicon-tetrachloride-market
[97] Seth Bodine, "The USDA Is Helping Expand Rural Broadband, But Providers Face Equipment Shortages," KOSU-NPR, August 12, 2021, https://www.kosu.org/technology/2021-08-12/the-usda-is-helping-expand-rural-broadband-but-providers-face-equipment-shortages
[98] FiberSystems, "AT&T: Supply chain issues to impact FTTH rollout," https://www.fibre-systems.com/news/att-supply-chain-issues-impact-ftth-rollout
[99] Fiber Broadband Association, "Strategies to Mitigate Bottlenecks in the Current Fiber Broadband Supply Chain." "Fiber Broadband Association Publishes Supply Chain Mitigation Strategies for The Broadband Industry," https://www.businesswire.com/news/home/20220928005183/en/Fiber-Broadband-Association-Publishes-Supply-Chain-Mitigation-Strategies-for-The-Broadband-Industry

process. See Section 5.4: Key Execution Strategies for more information on the subgrantee process.

4.7 Digital skills

Overview:

Gaps in digital skills will present barriers to broadband adoption even where broadband has been deployed. See Section 3.4.2.3: Digital skills above for more details on the existing needs and gaps in the State of Montana.

Mitigation:

Improved digital skills will be necessary to increase levels of broadband adoption, so MBO will ensure the Digital Opportunity Plan is coordinated with the broadband deployment program.

See also Section 3.4.2.4: Multi-sector strategies to further broadband adoption for more details on how MBO will partner with the state's workforce development and education initiatives. Since digital skills are essential for so many jobs, workforce development and education will help to create a workforce with improved digital skills: these skills will in turn be available to those workers outside of work, whether they are booking a telehealth appointment or applying for a job online, and will help to further the state's broadband goals.

4.8 Obstacles faced by covered populations

See Section 3.2.1: Covered Population Needs Assessment in the Digital Opportunity Plan for more information on the needs of covered populations. The Digital Opportunity Plan further details out strategies to address the identified barriers. See Section 5.1 in the Digital Opportunity Plan.

5 Implementation Plan

Montana's Implementation Plan for broadband deployment is founded on two premises: first, that the Five-Year Action Plan (FYAP) is the first step on a journey to deliver broadband to all Montanans, and second, that the Plan is an instrument for gathering input from stakeholders as well as from the NTIA.

In preparing the FYAP, the MBO has worked to identify Montanans' broadband access, affordability, digital opportunity, and adoption needs and to outline strategies, goals and measures for meeting those needs using BEAD and other available funds. As the NOFO states, the Five-Year Action Plan is step three of the nine steps listed in the BEAD Program's structure, including the Initial Proposal as well as the Final Proposal and Release of Remaining Funds. The FYAP is intended to help Montana establish its broadband goals and priorities and serve as a comprehensive needs assessment that will inform the Initial Proposal. This FYAP is (a) informed by collaboration with local, regional, and Tribal entities, as well as unions and worker organizations, (b) details Montana's investment priorities and associated costs, (c) aligns Montana's planned spending with its economic development, community benefit, workforce, telehealth, digital opportunity, and other related efforts, and (d) puts forward potential deployment scenarios for stakeholders and the NTIA to provide feedback on to support the detailed planning of the Initial Proposal.

To satisfy the goals of the FYAP (and eventual Initial Proposal), Montana has crafted its draft Implementation Plan in the following subsections of Section 5. This section outlines a plan for engaging key stakeholders, priority activities and strategies for the State of Montana, as well as detailing several potential broadband deployment scenarios. The broadband deployment scenarios are intended to provide stakeholders an opportunity to provide substantive input on which scenario may serve Montanans best. Montana's deployment plan will be further detailed in the Initial Proposal once the national broadband map is released and the NOAA is announced. In developing this plan and the further Initial and Final Proposals, Montana has and will continue to incorporate input from stakeholders, any outputs from the state legislative session, and input from the NTIA.

5.1 Stakeholder Engagement Process

This section answers the questions: how has Montana conceptualized and executed a comprehensive stakeholder engagement model, and how does it plan to conduct stakeholder engagement in future? How has the development of the Plan incorporated stakeholder engagement?

Montana's stakeholder engagement process for the Five-Year Action Plan and Digital Opportunity Plan has three main components:

I. Stakeholder identification

II. Engagement approach

III. Stakeholder outreach

Together, these efforts yielded a robust stakeholder engagement process, which allowed the state to place key constituents at the center of its plans to increase broadband availability in Montana and narrow the digital divide.

I. Stakeholder identification

With reference to BEAD guidance as well as input from state government contacts, MBO identified key external stakeholders and stakeholder groups to engage, including:

- **Political and governmental representatives**: state and territorial agencies, state senators and representatives, city and county officials (e.g., commissioners, other elected officials)
- **Tribal entities**: tribal leadership, tribal colleges, tribal businesses, tribal government officials
- **Community Anchor Institutions**: libraries, schools, healthcare centers, community colleges, other institutions of higher education, nonprofit and community-based organizations
- **Economic and workforce actors**: labor organizations and unions, entities that carry out workforce development programs, chambers of commerce, economic development organizations
- **Telecommunications providers**: internet service providers
- **Covered populations**: individuals who live in covered households, the income of which for the most recently completed year is not more than 150 percent of an amount equal to the poverty level, as determined by using criteria of poverty established by the Bureau of the Census; aging individuals; incarcerated individuals (excluding individuals incarcerated in federal facilities); veterans; individuals with disabilities; individuals with a language barrier; individuals who are members of a racial or ethnic minority group; individuals who primarily reside in a rural area

Once the list of stakeholder groups was defined, MBO identified specific individuals within each group, as well as any stakeholders relevant to this engagement process that did not belong to a predefined stakeholder group. This process required coordinating with public and private organizations for outreach and desk research (e.g., Google searching, cold calls, referrals) to develop a list of approximately 2,800 contacts representing the full range of stakeholders. Since Montana's efforts for the BEAD Five-Year Action Plan and the Digital Opportunity Plan are coordinated, this is a comprehensive list of stakeholders that applies to both plans.

II. Engagement approach

The MBO conducted two rounds of stakeholder engagement sessions. Round 1, conducted from September 7th to 14th, focused on identifying challenges to internet access and digital equity. Round 2, conducted from December 5th to 9th, focused on soliciting feedback to specific preliminary elements required by the BEAD and DE NOFOs and report templates provided by

NTIA. In both rounds, the MBO's approach to stakeholder engagement was guided by the following principles, outlined in the NTIA's guidance:

Full geographic coverage of the Eligible Entity

Hour-long, in-person stakeholder engagement sessions have been held in ten cities: Billings (round 1 and round 2), Glendive, Glasgow, Kalispell, Great Falls, Helena, Butte, Missoula, Havre, and Miles City. The round 2 session in Billings was specifically for Tribal leaders and communities, organized by the Crow Tribe of Nations in coordination with the MBO. The cities for the sessions were selected to ensure diverse geographical representation across the state from both the more populated hubs as well as the rural areas. Each session was hosted in a centrally located, easily accessible location within each city to enable maximum participation. Forty-six virtual stakeholder sessions have also been conducted, open to individuals and organizations located anywhere in the state. MBO will continue to ensure that geographic coverage of the state enables a range of Montanans to participate.

Meaningful engagement and outreach to diverse stakeholder groups

Exhibit 53 indicates the stakeholder groups for which virtual and in-person engagement sessions and surveys have been conducted. MBO will continue to prioritize outreach to diverse stakeholder groups.

Establishment, documentation, and adherence to clear procedures to ensure transparency

The stakeholder engagement process was shaped by a discussion guide that ensured the moderator covered all relevant topics while also providing the ability to move naturally between issues as the conversation flowed. Additionally, Montana deployed a streamlined survey to households and community leaders (see Exhibit 54, Exhibit 55, Exhibit 56, and Exhibit 57).

Outreach and engagement of unserved and underserved communities, including historically underrepresented and marginalized groups and/or communities

To direct stakeholder engagement, MBO developed a list of more than 2,800 stakeholders who represented populations highlighted in the NTIA requirements, including unserved / underserved and covered populations, to understand their needs related to the access, availability, and use of broadband. To reach covered populations, the state also held targeted interviews with stakeholders, including tribal leaders, the Department of Veterans Affairs, the Montana School for the Deaf and Blind, the Department of Corrections, the Department of Public Health and Human Services: State Unit of Aging, and the Montana Rural Development State Office.

Use of multiple awareness and participation mechanisms and different methods to convey information and outreach

Montana engaged its residents through multiple modalities, including 11 in-person and 46 virtual sessions (Exhibit 53) as well as two surveys that were distributed digitally (see Exhibit 54, Exhibit 55, Exhibit 56, Exhibit 57).

In-person and virtual sessions

MBO hosted both in-person and virtual outreach sessions with the public and targeted stakeholders to better understand the state's challenges in providing adequate broadband service to its residents (see Exhibit 53). The stakeholder engagement sessions were held both in person (during the periods of September 7-14 and December 5-9 2022) and virtually via Microsoft Teams (September through December 2022). The virtual sessions helped to ensure greater accessibility to stakeholders unable to make a physical session. For those that indicated interest in the virtual option, the MBO coordinated one-on-one to schedule sessions over Microsoft Teams with dial-in accessibility, consolidating as many individuals into the same stakeholder meeting as possible. Additional outreach through email and phone-calling was used to connect with as many stakeholders as possible, conducting supplemental desk research and leveraging referrals given during the sessions to add to the growing list of contacts.

There were two types of sessions, including general public sessions, which sought input from any interested Montanan, and specific stakeholder group sessions, which included representatives from targeted groups such as libraries, local governments, and ISPs.

To direct the sessions, Montana developed discussion guides that covered the following topics:

- Round 1: Challenges to community internet access, technology preferences, how government funds should be used to improve internet access in the community, suggestions for state government (ISP sessions only), digital equity, feasibility for ISPs (ISP sessions only), grant applications (ISP sessions only), and providing internet service (ISP sessions only)
- Round 2: Barriers to connectivity (ISP sessions only), broadband access strategies, digital opportunity strategies, strategies to further workforce development (ISP and tribal sessions only), strategies to address supply chain challenges (ISP sessions only), strategies to develop an equitable subgrantee process (ISP sessions only), and existing tribal awards (tribal sessions only)

The conversations were structured to be flexible to give participants the ability to move naturally between topics as the conversation flowed. This approach ensured participants had the opportunity to raise topics of interest, return to issues when they had additional input, and lead the conversation into the areas of greatest importance to them.

Surveys

Two surveys, with both quantitative and qualitative questions, were designed and deployed to a broad, representative group of Montanans. For survey methodology and results, please see Appendices 7.1-7.4.

- **Household surveys**: This survey was available to any Montanan over the age of 18 and distributed to a population representative of the state.

- **Community leader survey**: This survey was created to reach community leaders and institutions, including libraries, public health organizations, religious organizations, and chambers of commerce.

- **Topics covered included:**

- Availability of internet access at home and in the community
- Type and speed of internet access at home
- Reasons for internet use
- Awareness of internet subsidy programs, such as ACP
- Reasons for lack of home internet access
- Assessment of affordable monthly price for high-speed home internet

Alternate outreach modalities:

Additional outreach was conducted through email and phone calls to connect with as many stakeholders as possible. MBO will continue to connect with these stakeholders following submission and implementation of the BEAD Five-Year Action Plan.

Together, these various outreach methods allowed for maximum reach and accessibility to target populations, which helped the state develop a thorough understanding of the challenges in accessing broadband service.

To reach stakeholders, Montana used a number of awareness methods, including:

Flyers for the general public and stakeholder populations
Press releases
Social media posts for Twitter, Instagram, and Facebook
Email messaging tailored to state agencies and stakeholder populations
Updated state website language

To reach the general public and targeted stakeholder groups, MBO distributed materials on engagement opportunities through a range of partner organizations including Broadband MT, Montana Association of Counties, Montana Health and Human Services, Economic Developers Association, Montana State Library, Office of Public Instruction, Montana League of Cities, Montana Chambers of Commerce, Montana Department of Commerce, Governor's Office of [Native American] Affairs, Business Assistance Connection, ISPs, labor groups, nonprofits, and others. MBO also used press channels (TV, radio, newspaper) to distribute marketing materials, including KRTV, Great Falls Tribune, Glasgow Courier, BS Central, Glasgow Chamber, KLTZ Radio, KTVQ, KPAX, The Electric, KFBB, and MMJ Montana. Finally, MBO promoted the sessions through a network of stakeholder contacts by email, state social media pages, and the state website, as well as the state's GovDelivery email contact list.

III. Stakeholder outreach

The state reached a large, representative group of Montanans through its engagement process.

Exhibit 53: Stakeholders engaged through in-person and virtual sessions[100]

Stakeholder group	Number of individuals reached	Examples
Political and governmental representatives	35	State agencies and officials, city and county officials
Economic and workforce development, small businesses	17	Department of Labor and Industry, Montana Public Service Commission
CAIs	35	Billings Clinic, Glendive Public Library, Montana State Library, Office of Public Instruction, Montana Digital Academy
Telecommunications providers and associations	42	BroadbandMT, Nemont, Grizzly Broadband, Range Companies
Tribal entities	33	Native Inter-Tribal Health Alliance, Aaniiih Nakoda College
Covered populations	12	Department of Corrections, Veterans Navigation Network, Montana School for the Deaf and Blind
Total	174	

Exhibit 54: Stakeholders reached through the MBO household survey[101]

Population	Count	Percent (Total Number of Responses)	Percent (Total Number of Respondents)
Aged 60 or older	677	34.6%	41.7%
Veteran	251	12.8%	15.5%
Individual with a disability (mental or physical)	182	9.3%	11.2%
Non-native English speaker	23	1.2%	1.4%
Currently Incarcerated	0	0.0%	0.0%

[100] In-person and virtual sessions conducted by MBO
[101] Survey of Montana residents conducted by MBO Sep-Oct 2022. N=1,622

Population	Count	Percent (Total Number of Responses)	Percent (Total Number of Respondents)
Racial or Ethnic minority (such as Native American, Black, Hispanic, Asian, etc.)	126	6.4%	7.8%
None of these	656	33.5%	40.4%
Skipped/no response	41	2.1%	2.5%
TOTAL	1,956 responses (1,622 respondents)	100%	N/A

Exhibit 55: Stakeholders who live on reservations reached through the MBO household survey[102]

Reservation	Count	Percent
Blackfeet Tribe of the Blackfeet Reservation	7	7.9%
Chippewa Cree Tribe of the Rocky Boy's Reservation	4	4.5%
Confederated Salish and Kootenai Tribes of the Flathead Reservation	30	33.7%
Crow Tribe of the Crow Reservation	14	15.7%
Fort Belknap Tribes of the Fort Belknap Reservation	14	15.7%
Fort Peck Tribes of the Fort Peck Reservation	19	21.3%
Little Shell Chippewa Tribe	0	0.0%
Northern Cheyenne Tribe of the Northern Cheyenne Reservation	1	1.1%
TOTAL	89	100%

Exhibit 56: Stakeholders reached through the MBO community leader survey[103]

Community Group	Count	Percent
Adult education or literacy organization	3	3.2%
Advocacy group	0	0.0%
Chamber of commerce	6	6.4%
Education organization serving pre-kindergarten through high school students	4	4.3%
Higher education organization	4	4.3%
Internet service provider	13	13.8%
Labor organization	3	3.2%
Local government	30	31.9%
Nonprofit organization	17	18.1%
Public health organization (including health clinics)	2	2.1%
Public library	8	8.5%
Religious or faith-based organization	0	0.0%
Tribal government	0	0.0%
Veterans' association (such as the American Legion)	0	0.0%

[102] Survey of Montana residents conducted by MBO Sep-Oct 2022. N=1,622
[103] Survey of Montana community leaders conducted by MBO Sep-Oct 2022. N=94

Community Group	Count	Percent
Agriculture*	1	1.1%
Economic Development Organization*	1	1.1%
State Government*	2	2.1%
TOTAL	94	100%

Exhibit 57: Community groups that are located on or that serve reservations, reached through the MBO community leader survey[104]

Reservation	Count	Percent
Blackfeet Tribe of the Blackfeet Reservation	1	1.1%
Chippewa Cree Tribe of the Rocky Boy's Reservation	2	2.1%
Confederated Salish and Kootenai Tribes of the Flathead Reservation	4	4.3%
Crow Tribe of the Crow Reservation	0	0.0%
Fort Belknap Tribes of the Fort Belknap Reservation	2	2.1%
Fort Peck Tribes of the Fort Peck Reservation	9	9.6%
Little Shell Chippewa Tribe	0	0.0%
Northern Cheyenne Tribe of the Northern Cheyenne Reservation	2	2.1%
No response/skipped	74	78.7%
TOTAL	94	100%

Throughout the outreach process, there was a general sentiment that stakeholders are optimistic about the opportunities that will be provided by broadband expansion and efforts to close the digital divide. The state has considered which partnerships it will pursue as it implements its plans, and a number of potential partnerships—including with workforce agencies and educational institutions—are outlined in the implementation strategies in Section 5 in both the Digital Opportunity Plan and BEAD Five-Year Action Plan.

As noted in Section 5.4.3 in the BEAD Five-Year Action Plan, in terms of involving other workforce development organizations, MBO plans to partner primarily with the Montana Department of Labor and Industry in working to attract and retain the skilled workforce needed for broadband deployment.

5.2 Priorities

This section answers the question: what are the overall priorities that inform MBO's approach to broadband deployment and digital opportunity?

Montana's priorities for broadband deployment represent the key principles that inform MBO's development of the Five-Year Action Plan. These priorities derive from the Goals and Objectives laid out in Section 2.2; however they are not goals in and of themselves, but priorities that

[104] Survey of Montana community leaders conducted by MBO Sep-Oct 2022. N=94

inform the direction and the content of those goals. They also inform the Planned Activities laid out in Section 5.3.

Table 16: Priorities for Broadband Deployment and Digital Opportunity

Priority	Description
Accelerate Montana's broader goals through broadband deployment	Montana will develop a broadband plan that serves Montana's goals related to economic and workforce development, education, health, civic and social engagement, and the delivery of other essential services
Ensure all Montanans have access to high-speed internet by utilizing a mix of technologies	Montana will consider all available technologies to achieve its broadband goals, given that BEAD and other funding sources are likely collectively insufficient to deploy fiber to all Montana locations
Deploy broadband funds in a cost-effective manner	Montana will set an Extremely High-Cost Per Location Threshold that will ensure effective use of funds by prioritizing fiber, but deploying other technologies when fiber is not economically feasible
Activate key stakeholders throughout the state in the planning process	Montana will connect with under-represented groups, state legislators, executive officials, and ISPs to support development of a plan that is ambitious, but still attainable
Partner with non-governmental organizations (NGOs) to promote broadband adoption and digital opportunity	Montana will partner with non-governmental organizations and other partners to further broadband adoption and digital opportunity, especially among covered populations
Implement programs to ensure affordability of internet subscriptions and devices	Montana will partner with non-governmental organizations and ISPs to promote ACP adoption, while also ensuring sub-grantees offer low-cost plans to eligible Montanans
Reduce costs and barriers to deployment by administering an efficient and transparent sub-grantee selection process	Define a sub-grantee selection process with input from stakeholders that will remove barriers to broadband deployment by ensuring efficiency, transparency, and fairness for all applicants

5.3 Planned Activities

This section answers the question: What past, present and future activities are necessary to support the Five-Year Action Plan, the Initial Proposal and Final Proposals?

5.3.1 Develop Five-Year Action Plan (FYAP)

The Five-Year Action Plan is intended to help Montana establish its broadband goals and priorities and serve as a comprehensive needs assessment that will inform the Initial Proposal.

The FYAP (a) is informed by collaboration with local, regional, and Tribal entities, as well as unions and worker organizations, (b) details Montana's investment priorities and associated costs, and (c) aligns Montana's planned spending with its economic development, community benefit, workforce, telehealth, digital opportunity, and other related efforts. As such, the Montana Broadband Office has prioritized the following activities to best serve Montanans and to meet the FYAP requirements:

Completed

- Held initial stakeholder engagement sessions to understand existing needs and gaps as it relates to broadband access and adoption
- Crafted needs and gaps assessment to understand various broadband gaps between different demographics and geographic areas
- Developed potential deployment scenarios that prioritize fiber deployment to unserved locations, as well as digital opportunity strategies (further detailed in the Digital Opportunity Plan)
- Outlined current barriers to broadband deployment, such as workforce capacity, and potential strategies to mitigate
- Engaged key stakeholders, such as covered populations, tribal populations and Montana small business representatives to solicit input on draft BEAD Five-Year Action Plan and Digital Opportunity Plan)
- Engaged Montana legislature to ensure align with BEAD requirements

Not Yet Completed

- Collaborate with the NTIA Federal Program Officer to align on the Five-Year Action Plan
- Submit BEAD Five-Year Action Plan

5.3.2 Initial Proposal

The Initial Proposal will detail how Montana intends to use BEAD funding, including how it will design both a challenge process and a competitive subgrantee selection process. The Initial Proposal will explain how Montana intends to ensure that every resident has access to a reliable, affordable, high-speed broadband connection, using all funding available to accomplish this goal, including but not limited to BEAD Program funds. As such, the Montana Broadband Office will prioritize the following actions to meet the Initial Proposal requirements:

- Finalize deployment scenarios with stakeholder input such that 100 percent of identified Montana unserved populations are projected to achieve "served" status, with additional underserved locations also upgraded where possible
- Identify existing digital opportunity efforts in Montana and align on long-term objectives for deploying broadband, closing the digital divide, addressing access, affordability, digital opportunity, and adoption issues, and enhancing economic growth and job creation

- Design a challenge process that allows institutions to challenge service availability for broadband serviceable locations
- Design a subgrantee process that effectively deploys broadband in a timely and cost-effective manner, and selects subgrantees that align with the goals of Montana and operates within BEAD guidance/guardrails
- Detail how Montana will ensure an available, diverse, and highly skilled workforce with strong labor standards and protections
- Strategize on how Montana will ensure that minority businesses, women-owned business enterprises, and labor surplus area firms are recruited, used, and retained when possible
- Identify cost-reduction strategies that use existing infrastructure and adopt dig-once policies
- Explore the potential effect of climate threats in Montana
- Engage key stakeholders for alignment on the Initial Proposal
- Submit Initial Proposal to NTIA for approval

5.3.3 Challenge Process

The NOFO states: "After submission of its Initial Proposal and before allocating BEAD funds received for the deployment of broadband networks to subgrantees, an Eligible Entity must conduct a challenge process." This is distinct from the process by which the Federal Communications Commission accepts challenges to the data underlying the Broadband Serviceable Location Fabric, the basis for the FCC's broadband availability maps. In line with the NOFO, under Montana's process, a unit of local government, nonprofit organization, broadband service provider, or others can challenge a determination made by MBO in the Initial Proposal as to whether a particular location or community anchor institution is unserved or underserved. MBO will then submit any successful challenges to NTIA for review and approval. MBO will prioritize the following actions:

- Outline criteria that will be used to evaluate the validity of submitted challenges
- Collect challenges from institutions based on the latest FCC map of broadband service availability in Montana
- Evaluate challenges and update Montana's broadband availability estimates based on successful applications
- Submit successful challenges to NTIA for review, approval and additions to the FCC's National Broadband Map

5.3.4 Subgrantee Application Process

MBO will establish a fair, open, and competitive process for selecting subgrantees. The NOFO states: "The selection of subgrantees is a critically important process that will determine which

providers will bring service to all Americans, and in many cases, which entities will stand up and operate training programs and take other actions aimed at closing the digital divide … Eligible Entities' selection processes must be made clear to potential subgrantees." Montana's criteria and selection process will be developed based on input from stakeholders and clearly laid out for potential subgrantees. It will also be documented in Montana's Initial Proposal and Final Proposal. The Montana Broadband Office will prioritize the following actions to meet the Subgrantee Application Process requirements:

- Develop and distribute the selection criteria and subgrantee process details
- Call for applications from potential subgrantees to access funding for broadband deployment
- Review proposals and select subgrantees best suited for the needs and priorities of Montana based on the criteria
- Conduct follow-up with subgrantees on proposals to gain final alignment
- Award and prioritize subgrantee projects based on the review process
- Include outcomes of the subgrantee application process in the Final Proposal

5.3.5 Final Proposal

Montana will submit a Final Proposal to NTIA no later than twelve months after the date upon which the Assistant Secretary approves Montana's Initial Proposal. The Final Proposal will detail fund allocation strategies, a timeline, accountability measures, stakeholder and small business engagement certification, service of all unserved and underserved locations certification, description of planned funding areas, environmental considerations, tribal land consent, information about unsuccessful applications, workforce development strategies, and digital opportunity strategies. It will also detail any outcomes of the subgrantee process, challenge process, and initial deployment. As such, the Montana Broadband Office will prioritize the following actions to meet the Final Proposal requirements with the goal of achieving universal broadband deployment:

- Outline final fund allocation strategies, timeline, accountability measures, stakeholder and small business engagement certification, service of all unserved and underserved locations certification, description of planned funding areas, environmental considerations, tribal land consent, information about unsuccessful applications, workforce development strategies and digital opportunity strategies
- List outcomes of the subgrantee process, challenge process, and initial deployment
- Submit the Final Proposal to NTIA for approval

5.3.6 Deployment

Throughout the BEAD Program, MBO will conduct ongoing monitoring of progress against its plans and ensure that the requirements of the Infrastructure Act are met. Montana will also establish a cadence with subgrantees to ensure compliance with reporting requirements for both

Montana and subgrantees. As such, the Montana Broadband Office will prioritize the following actions to meet the deployment requirements:

- Disburse first 20 percent of funding to priority subgrantees to begin progress on priority areas upon receipt of funds following approval of the Initial Proposal
- Submit priority disbursement report to NTIA to gain alignment on initial disbursement
- Disburse final 80 percent of funding to subgrantees to begin progress on remaining areas
- Conduct ongoing monitoring and compliance with subgrantees to ensure they are meeting the requirements and progressing toward their project goals
- Provide technical assistance to subgrantees to mitigate any potential risks and ensure Montana's broadband goals are met
- Collect semiannual subgrantee reports for quality, financial and legal assurance and compile into semiannual report for NTIA
- Submit final report to NTIA to close out the project

5.4 Key Execution Strategies

This section answers the question: what are the key strategies that MBO will pursue in alignment with the statutory requirements of the BEAD Program related to digital opportunity, the challenge process, the subgrantee process, and workforce development?

5.4.1 Strategies to further digital opportunity

There are four primary barriers to broadband adoption in the State of Montana:

I. Broadband availability
II. Service affordability
III. Device access
IV. Digital skills

While all those without adequate broadband face some combination of these barriers, those who fall into one or more covered populations often experience disproportionate challenges.

Comprehensive approaches to breaking down the barriers to adoption are particularly critical for those individuals who exist at the intersection of multiple covered populations. For example, there is considerable overlap between individuals who live in rural areas and individuals who are over the age of 65, and data indicates individuals with this profile may experience the biggest gaps in both digital skills and broadband availability.

As states across the nation develop and implement new strategies to promote digital opportunity, Montana will stay abreast of progress and incorporate successful initiatives into its own efforts as appropriate. For example, Vermont announced the launch of an apprenticeship program, which trains its state residents as technicians to build broadband infrastructure.[105] Montana, which has implemented its successful Registered Apprenticeship Program (see Section 2.2), may adopt some of the learnings from Vermont to upskill its residents into higher-paying jobs as technicians while also supporting Montana's broader goals of improving internet availability and keeping jobs in the state.

Potential programs and strategies to close the digital divide for Montanans have been outlined below. Further information on each of these strategies is available in Section 5.1: Implementation Strategy and Key Activities of the Digital Opportunity Plan:

Broadband Availability

- **Connect the unserved**: Last-mile and associated middle-mile deployment of broadband technologies to areas without service of at least 25/3 Mbps
- **Upgrade the underserved**: Deploying and/or upgrading technologies to areas with service below 100/20 Mbps
- **Invest in community anchor institutions**: Ensure reliable high-speed access at CAIs or identify opportunities in non-traditional CAIs

Service affordability

- **Increase ACP uptake**: Educate, support and encourage uptake among eligible subscribers
- **Offer low-cost plans**: Partner with ISPs to develop and promote low-cost high-speed internet plans

Device access

- **Expand loan programs**: Allow Montanans to rent devices for free or low-cost from CAIs and state agencies, expanding existing popular loaning initiatives and potentially replicating them in additional locations
- **Increase CAI access points**: Increase device access terminals in CAIs, taking advantage of the high-speed broadband and existing community access
- **Invest in additional state devices**: Increase Montana's device inventory, allowing the state to better provide devices to individuals that need them and expand the other programs listed above

Digital skills

[105] "VCBB Announce New Workforce Development Plan," https://publicservice.vermont.gov/announcements/vcbb-announces-new-workforce-development-plan

- **Develop digital skills curricula**: Deploy basic, occupational digital training programs with state entities and targeted industries
- **Fund targeted training programs**: Upskill individuals through classes and training programs, with potential focus on Covered populations (e.g., aging individuals, individuals in rural areas, veterans)

5.4.2 Strategies to conduct an efficient challenge process

MBO's goal in conducting the state's challenge process is to ensure efficient use of public funds by developing the most accurate and comprehensive current state view of broadband availability across the state of Montana. The challenge process will work to ensure (1) all broadband serviceable locations (BSLs) are included in the Montana Broadband Map and (2) Montana has a clear view of the broadband service available to each of these BSLs. Once the broadband map has been finalized, it will serve as the basis for determining project areas and awarding subgrantee awards to deploy broadband to the unserved and underserved locations. Given the relatively short amount of time required to conduct the subgrantee process, MBO will work to ensure a clear, transparent, and efficient challenge process to minimize any potential process delays. It is important to note that Montana's challenge process is separate from the challenge process by which eligible entities can challenge the FCC's national broadband map. Montana's challenge process will build on the efforts conducted by the FCC to ensure the most comprehensive map of broadband serviceable locations and service availability in Montana.

Requirement: Conduct a challenge process

According to the BEAD NOFO, "after submission of its Initial Proposal and before allocating BEAD funds received for the deployment of broadband networks to subgrantees, an Eligible Entity must conduct a challenge process. Under this process, a unit of local government, nonprofit organization, or broadband service provider can challenge a determination made by the Eligible Entity in the Initial Proposal as to whether a particular location or community anchor institution within the jurisdiction of the Eligible Entity is eligible for the grant funds, including whether a particular location is unserved or underserved, and Eligible Entities must submit any successful challenges to NTIA for review and approval."

Potential strategies MBO may consider to meet this requirement

a. Complete the challenge process before the subgrantee process

   MBO may consider conducting the challenge process upon submission of the Initial Proposal to NTIA in order to streamline the subgrantee process and accelerate the overall BEAD program. In this event, MBO would ensure ample time for potential subgrantees to participate in the process while also providing an opportunity to efficiently execute the subgrantee process once the Initial Proposal is approved.

b. Complete the challenge process as part of the subgrantee process

   MBO may also consider conducting the challenge process in coordination with the subgrantee process. In this event, the challenge process would not begin until the Initial Proposal is approved. Subgrantees would then have the opportunity to challenge whether a particular location is eligible for grant funds after the preliminary awards have been announced.

5.4.3 Strategies for developing an equitable subgrantee process

MBO will develop an equitable, efficient, and transparent subgrantee process that meets the statutory requirements of the BEAD program, aligns with the legislative guidance of the state, and awards subgrants competitively in service of reaching as many Montanan homes, institutions, and businesses with broadband as possible. It will clearly establish and communicate the parameters and criteria for evaluating applications to competitively award grants for both the broadband deployment process as well as for the digital opportunity projects addressed separately in the Digital Opportunity Plan. Given the relatively short timeline required to conduct the subgrantee process, simplicity and efficiency will be important guiding principles in designing the process.

The BEAD NOFO includes a number of requirements and guidelines impacting the subgrantee process. Montana has reviewed these requirements and structured its process around what it considers to be the most important requirements that will materially impact its broadband deployment. MT will keep all requirements and guidelines in mind as it develops its process in service to running an efficient and effective process for Montanans:

A. Allocation requirements

1. Make funding available for projects that meet the definitions of "unserved service projects" and "underserved service projects" under federal law
2. Prioritize based on (1) Unserved, (2) Underserved, and (3) CAIs while ensuring that 100 percent of unserved locations will be reached
3. Prioritize projects that provide fiber directly to the end user, unless economically infeasible to do so, and that deliver reliable broadband service to the extent technically possible
4. Consider other technologies above the Extremely High Cost per Location Threshold

B. Subgrantee compliance and scoring requirements

5. Incentivize matches of greater than 25 percent from subgrantees
6. Incentivize deployment that is faster than the required four years, considering speed to deployment as a secondary criterion
7. Ensure subgrantee compliance with security and supply chain risk management requirements
8. Ensure subgrantee alignment to state and federal labor guidance
9. Ensure provision of affordable, high-speed internet, including via a low-cost plan requirement for subgrantees

C. Process requirements

10. Protect the integrity of the subgrantee process
11. Prevent duplicate public funding for locations already subject to an enforceable federal, state, or local commitment to deploy qualifying broadband
12. Allow applications from all classes of subgrantees

An overview of potential strategies that Montana will implement to ensure alignment with these requirements is provided below.

A1. Make funding available for projects that meet the definitions of "unserved service projects" and "underserved service projects" under federal law

According to the BEAD NOFO, the term "Unserved Service Project" means a project in which not less than 80 percent of broadband-serviceable locations served by the project are unserved locations, while the term "Underserved Service Project" means a project in which not less than 80 percent of broadband-serviceable locations served by the project are unserved locations or underserved locations. Both may be as small as a single unserved or underserved broadband-serviceable location.

Potential strategies MBO may consider to meet this requirement

MBO will ensure that funding is allocated to qualifying service projects by accurately assessing broadband-serviceable locations through an updated broadband map and challenge process and by prioritizing the funding of such projects accordingly.

A2. Prioritize based on (1) Unserved, (2) Underserved, and (3) CAIs while ensuring that 100 percent of unserved locations will be reached

According to the BEAD NOFO, the "Eligible Entity may seek proposals to serve unserved locations, underserved locations, and CAIs collectively or separately, so long as the Eligible Entity awards funding in a manner that prioritizes Unserved Service Projects and once it certifies that it will ensure coverage of all unserved locations within the Eligible Entity, prioritizes Underserved Service Projects."

Potential strategies MBO may consider to meet this requirement

a. MBO to pre-define project areas and associated available BEAD subgrant funding levels such that all unserved locations are reached using BEAD funding

   MBO may consider pre-defining project areas for the subgrantee process to ensure coverage of all unserved and underserved locations since project areas would be collectively exhaustive. ISPs could submit applications to bid on multiple project areas. Clear selection criteria to evaluate competing proposals for the same project area would be established and shared publicly in advance. To ensure no project areas are left out, MBO may include provisions that require ISPs to bid on unserved project areas and not only on underserved ones.

b. ISPs to propose project areas

   Alternatively, MBO may consider allowing ISPs to propose their own project areas as part of the subgrantee application process. In keeping with the requirements of the BEAD NOFO, MBO would develop a mechanism for de-conflicting overlapping proposals. To ensure no unserved locations are left out, MBO may include requirements on the inclusion of nearby unserved locations or implement another mechanism to ensure coverage as part of the evaluation review process.

c. Combination of MBO-defined and ISP-defined project areas

   Given the unique geographical nature of Montana's distinct regions, MBO may also consider a hybrid approach. In this event, MBO would pre-define some project areas, but also leave other areas open for ISPs to define the project areas. ISPs could bid on

both types of project areas. MBO would develop a mechanism to ensure no project areas or locations are left out.

A3. Prioritize projects that provide fiber directly to the end user, unless economically infeasible to do so, and that deliver reliable broadband service to the extent technically possible

According to the BEAD NOFO, "NTIA has determined that 'Priority Broadband Projects' are those that use end-to-end fiber-optic architecture."

Potential strategies MBO may consider to meet this requirement

With respect to the deployment of last-mile broadband infrastructure, when selecting between competing proposals, MBO will prioritize projects designed to provide fiber connectivity directly to the end user. In keeping with both the BEAD requirements and Montana's plans to scale its broadband infrastructure, MBO's Five-Year Action Plan implements a preference for fiber deployment, including where less expensive solutions are available in the form of fixed wireless or satellite deployment. However, given the fact that Montana may not receive sufficient funding to reach all unserved locations and upgrade all underserved locations with fiber, MBO will establish an "Extremely High Cost per Location Threshold" to determine at what point other lower cost technologies such as fixed wireless or satellite may be considered. Potential scenarios for deployment of these technologies based on preliminary analysis is further detailed in Section 5.6: Estimated Cost for Universal Service.

A4. Consider other technologies above the Extremely High Cost per Location Threshold

According to the BEAD NOFO, an "Extremely High Cost Per Location Threshold" is a BEAD subsidy cost per location to be used during the subgrantee selection process above which an Eligible Entity may decline to select a proposal if use of an alternative technology meeting the BEAD Program's technical requirements would be less expensive."

Potential strategies MBO may consider to meet this requirement

MBO will conduct an extensive service availability and cost modeling analysis to compare various Extremely High Cost per Location Thresholds and the associated impact on deployment. This analysis will enable MBO to select the ideal deployment scenario that meets the requirements of the BEAD NOFO, while also achieving the overall objectives of the State of Montana. The Extremely High Cost per Location Threshold will enable Montana to extend the BEAD funding as far as possible in closing the digital divide by expanding fiber wherever economically and technically feasible, but also deploying a mix of technologies for maximum coverage. In project areas containing locations above the EHCLT, MBO will establish complementary procedures to maximize the deployment of Reliable Broadband Service to the extent technically feasible. Potential Extremely High Cost per Location Thresholds and corresponding scenarios for deployment based on preliminary analysis are further detailed in Section 5.6: Estimated Cost for Universal Service.

B5. Incentivize matches of greater than 25 percent from subgrantees

According to the BEAD NOFO, "Each Eligible Entity shall provide, require its subgrantee to provide, or provide in concert with its subgrantee, matching funds of not less than 25 percent of project costs. Eligible Entities are also required to incentivize matches of greater than 25 percent from subgrantees wherever feasible (especially where expected operational costs and revenues are likely to justify greater investment by the subgrantee)."

Potential strategies MBO may consider to meet this requirement

In keeping with the BEAD requirements, all subgrantees will be required to invest their own funds with a match of at least 25 percent, instead of relying exclusively on BEAD funding. The MBO is in the process of analyzing the estimated cost to serve each unserved location and upgrade all underserved locations across the state. The cost model will take into account projected discounted future cash flows that will be generated by customer subscriptions, as well as the expected capital expenditures required. This cost model will enable the MBO to evaluate project proposals by subgrantees to ensure the proposed percentage match is aligned with the anticipated costs of the project. A preliminary view of the estimated total cost to serve is provided in Section 3.4.1. MBO will also define clear scoring criteria that will incentivize greater matches by subgrantees to ensure efficient use of public funds and extend the available allocation as far as possible in closing the digital divide. In addition, the model will be used to validate subgrantee requests for waivers of the 25 percent minimum match requirement, including in the identification of high-cost areas of the state that would be eligible for such match waiver requests to NTIA.

B6. Incentivize deployment that is faster than the required four years, considering speed to deployment as a secondary criterion

According to the BEAD NOFO, "Subgrantees that receive BEAD Program funds for network deployment must deploy the planned broadband network and begin providing services to each customer that desires broadband service within the project area not later than four years after the date on which the subgrantee receives the subgrant from the Eligible Entity."

Potential strategies MBO may consider to meet this requirement

In keeping with the BEAD requirements, MBO will not only work to ensure all subgrantees complete projects within four years, but will also give secondary criterion prioritization weight to the prospective subgrantee's binding commitment to provide service by an earlier date subject to contractual penalties, with greater benefits awarded to applicants promising an earlier service provision date.

MBO will conduct ongoing monitoring to both ensure that subgrantees comply with the eligible uses of funds prescribed in the BEAD NOFO, and also evaluate progress toward the four-year timeline and success of the program. MBO will ensure that the application and review process collects metrics that can be used as a baseline and specifies ongoing reporting requirements; subsequently, MBO will ask subgrantees to report on their

deployment progress and provide updated metrics at least twice a year. MBO will centrally evaluate these metrics over time to develop a view of how broadband deployment is progressing across the state and to identify any bottlenecks or challenges that can be addressed. MBO has also engaged a team of engineers that will provide technical assistance to subgrantees to support achieving the program goals and address any potential risks identified.

B7. Ensure subgrantee compliance with security and supply chain risk management requirements

According to the BEAD NOFO, Eligible Entities must require a subgrantee to attest to having a cybersecurity risk management plan as well as an operational or operationally ready supply chain risk management plan.

Potential strategies MBO may consider to meet this requirement

To ensure that Montanans benefit from providers that offer robust cybersecurity and supply chain risk management, MBO will require subgrantees to attest to prudent cybersecurity and supply-chain risk management practices.

B8. Ensure subgrantee alignment to state and federal labor guidance

According to the BEAD NOFO, Eligible Entities must "ensure that subgrantees, contractors, and subcontractors use strong labor standards and protections."

Potential strategies MBO may consider to meet this requirement

To ensure that Montanans benefit from strong labor standards and workforce development programs, MBO will require prospective subgrantees' to certify their record of compliance with both federal and state labor and employment laws, including their compliance on broadband projects in the past three years, as well as the compliance of contractors and subcontractors. In keeping with the BEAD requirements, Montana will prioritize projects that meet these requirements in its subgrantee process, where the requirements include training / apprenticeship / "available workforce" issues. State labor standards include the Labor section of the Montana code. Federal labor standards include the Occupational Safety and Health Act, the Fair Labor Standards Act, and the Service Contract Act.

New entrants without a record of labor and employment law compliance will be evaluated on the basis of specific, forward-looking commitments to strong labor and employment standards and protections with respect to BEAD-funded projects. For existing operators, MBO will obtain and evaluate subgrantees' plans for ensuring compliance with federal and state labor and employment laws in the future. Finally, MBO will evaluate information on any partnerships that subgrantees have with existing in-house skill training programs and evaluate them in the context of the project's labor needs.

In addition to strong labor standards, the NOFO also requires plans to promote a diverse workforce including women- and minority-owned businesses. MBO will hence ensure

that minority businesses, women-owned business enterprises, and labor surplus area firms are recruited, used, and retained wherever possible.

B9. Ensure provision of affordable, high-speed internet, including via a low-cost plan requirement for subgrantees

According to the BEAD NOFO, "the Infrastructure Act requires that each subgrantee receiving BEAD funding to deploy network infrastructure offer at least one low-cost broadband service option."

Potential strategies MBO may consider to meet this requirement

Through its stakeholder engagement process, MBO will work closely with ISPs and the public to define clear guidelines for ISPs that will meet the requirements of a low-cost broadband service plan. MBO has already engaged stakeholders both through a survey with 1,622 residents and via one-on-one meetings, focus groups, and public meetings to help determine criteria for a reasonable low-cost plan. MBO has also conducted secondary research to identify best practice examples of low-cost plans from other states. MBO will not only ensure all subgrantees meet the requirements to be established for a low-cost plan, but also take overall affordability (total price to the customer for 100/20 Mbps service) into account when selecting subgrantees from competing proposals in one project area. Finally, MBO will work with subgrantees to further improve affordability by ensuring they not only accept ACP but offer high-quality and low-cost service options on reasonable and non-discriminatory terms.

C10. Protect the integrity of the subgrantee process.

According to the BEAD NOFO, in establishing a fair, open, equitable, and competitive selection process, each Eligible Entity must ensure that adequate safeguards are in place to protect the integrity of the competition, including safeguards against collusion, bias, conflicts of interest, arbitrary decisions, and other factors that could undermine confidence in the process.

Potential strategies MBO may consider to meet this requirement

MBO will conduct extensive stakeholder engagement throughout development of the subgrantee process to ensure clear understanding of the program goals and requirements. Scoring criteria will be clearly articulated and made available for public comment before commencing the subgrantee application process. Furthermore, MBO may also consider separating the Challenge Process from the Application/Award process to help prevent any potential anti-competitive behavior.

C11. Prevent duplicate public funding for locations already subject to an enforceable federal, state, or local commitment to deploy qualifying broadband

According to the BEAD NOFO, "In identifying an Unserved Service Project or Underserved Service Project, an Eligible Entity may not treat as "unserved" or "underserved" any location that is already subject to an enforceable federal, state, or local commitment to deploy qualifying broadband as of the date that the challenge process described in Section IV.B.6 of the BEAD NOFO is concluded." However, the

NOFO also states that if a given project includes a mix of unserved locations that are both (a) subject to such an existing federal/state/local commitment, and (b) not so subject, an Eligible Entity may fund the overall project if steps are taken as part of the Challenge Process to ensure that funding is not being used for the locations in (a).

Potential strategies MBO may consider to meet this requirement

Montana has already been working to develop its state-level broadband map to determine the accurate broadband serviceable locations and corresponding level of service availability. Once the final FCC maps are released, Montana will be able to overlay its existing map with the FCC broadband map to develop the most comprehensive view of the current state of broadband in Montana. The state is also working with its mapping vendor to incorporate locations with an enforceable commitment under more recent state and federal broadband programs (e.g., Reconnect Round 3, ARPA allocations, etc.). Montana will maintain an accurate broadband map throughout this process to ensure no locations receive duplicate funding.

C12. Allow applications from all classes of subgrantees

According to the BEAD NOFO, "the Eligible Entity may not exclude, as a class, cooperatives, nonprofit organizations, public-private partnerships, private companies, public or private utilities, public utility districts, or local governments from eligibility as a subgrantee."

Potential strategies MBO may consider to meet this requirement

Private companies and nonprofit organizations are currently eligible to provide internet service and apply for funding under Montana law. However, Montana is one of several states that have existing laws prohibiting municipal ownership of ISPs. In keeping with the requirements of the BEAD NOFO, Montana may allow municipalities and other public entities to apply for funding under this program in partnership with private or nonprofit ISPs.

5.4.4 Strategies to further workforce development

MBO has structured its workforce development strategy according to the "Workforce Planning Guide: Guidance for BEAD Program Eligible Entities." The guide includes a Workforce Requirements Checklist for BEAD Submission Preparation, which has five items:

1. **A list of full-time, part-time employees, and contractors who will assist in implementing and administering the BEAD program**: Montana has assembled a full team of employees and contractors to implement the BEAD Program. The MBO will oversee the workforce development dimension of Montana's BEAD Program and will continue to develop relationships with stakeholders and partners. See Section 3.1: Existing programs for more details.

2. **Identification and plans to address known or potential obstacles to successful project implementation, which may involve workforce challenges**: Montana has conducted a study of the anticipated labor gap. The MBO will maintain an open dialogue with all stakeholders regarding workforce challenges and will

work closely with the Department of Labor and Industry to address them. See Section 4.4: Labor gap for details.

3. **A description of external engagement processes, including those involving underrepresented communities, unions, and worker organizations**: Montana has conducted an extensive stakeholder engagement process. MBO will continue to engage with these stakeholders after submitting the Plan and over the course of developing the Initial Proposal and Final Proposal. See Section 5.1: Stakeholder Engagement Process for details.

4. **Alignment of the Five-Year Action Plan with other existing and planned workforce development efforts and priorities**: Montana's study of alignment between broadband deployment and other state priorities encompasses the state's workforce priorities. In the future, MBO will continue to work closely with partners in other state departments as part of its stakeholder engagement process to ensure that broadband deployment aligns with their goals. See Section 5.7.2.2: Workforce development for details.

5. **Strategies to ensure an available and highly skilled workforce to complete BEAD projects, including through partnerships and training programs**: MBO's strategies to ensure an available workforce for BEAD deployment fall under two categories: strategies involving subgrantees, and strategies involving other workforce development organizations, both of which are detailed below.

Strategies involving subgrantees

MBO will require that subgrantees adhere to federal and state employment laws as detailed in Section 5.4.2: Strategies for developing an equitable subgrantee process above. MBO will also require subgrantees to provide information around any existing partnerships with in-house training programs and worker organizations.

Strategies involving other workforce development organizations

MBO plans to partner primarily with the Montana Department of Labor and Industry in working to attract and retain the skilled workforce needed for broadband deployment.

The Department is home to programs such as the Montana Registered Apprenticeship Program, which provides paid, on-the-job training that teaches specific and technical job skills unique to the employer's profession, and confers a nationally recognized certificate on completion. The MBO will provide information to the Department on the timeline for broadband deployment, roles needed, and skills needed, to facilitate workforce development partnerships.

MBO will also partner with organizations such as Accelerate Montana which helps organizations identify their hiring needs while offering them a pool of candidates with the skills they are looking for. Via the Department of Labor and Industry, MBO will provide information to Accelerate Montana as needed, to help provide rapid upskilling to Montanans interested in filling the labor gap created by the need to expand broadband infrastructure and administer ongoing support.

More information on these plans is available in Section 5.7.2.1: Economic and workforce development below.

5.5 Estimated Timeline for Universal Service

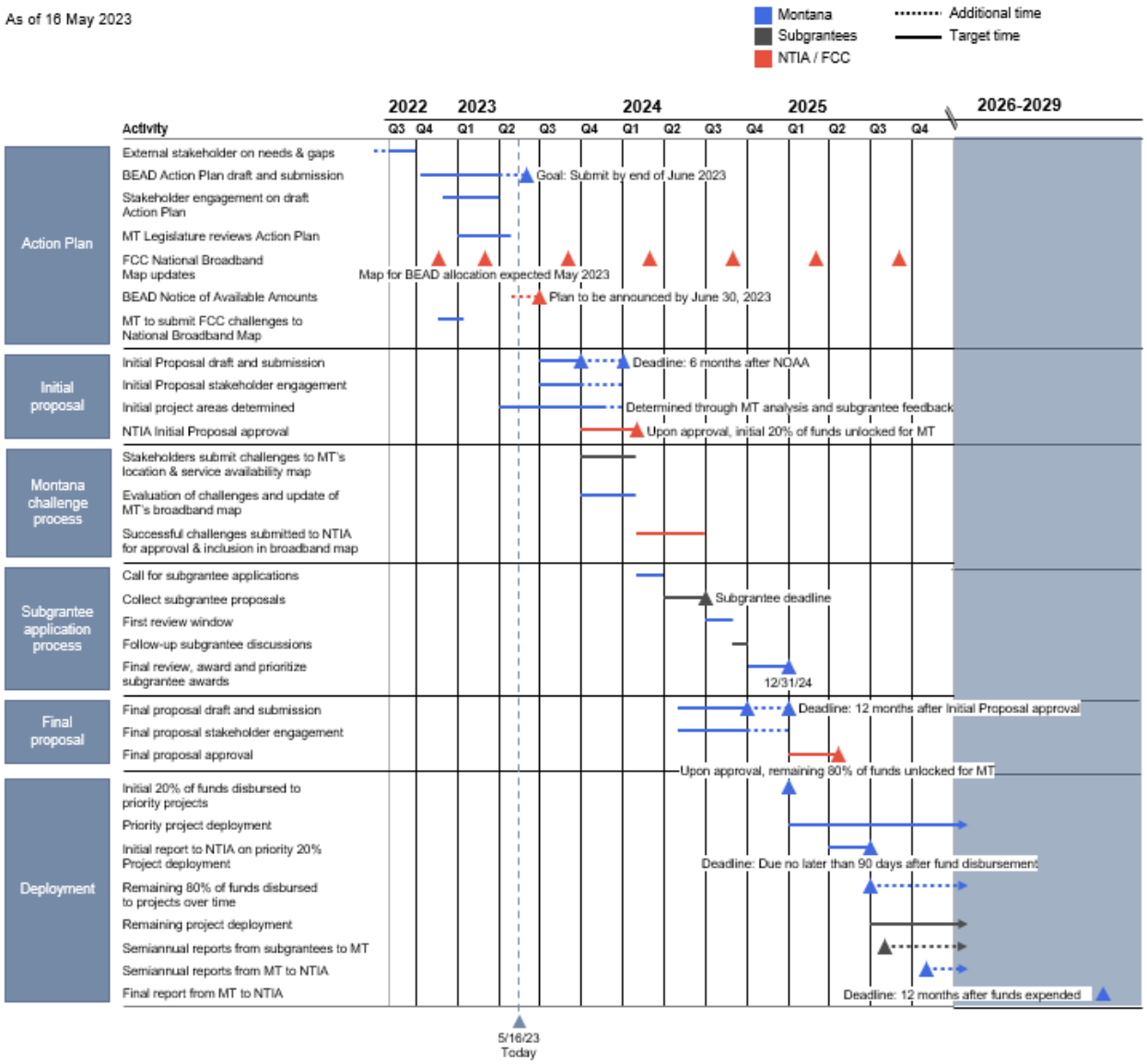
This section answers the question: when will reliable, affordable, high-speed internet be made available throughout Montana?

Montana estimates that it may be able to help provide reliable, affordable, high-speed internet to nearly all Montanans by 2030.

Several programs are already in flight (refer to 3.1 Existing Programs for more information) and will contribute to Montana's goal of universal service. BEAD funding may be sufficient for Montana to achieve internet availability for unserved and underserved locations. Montana has developed initial scenarios for stakeholder feedback in 5.6 Estimated Cost of Service that can be referred to as potential options for how BEAD allocation funds will help Montana reach its goals.

In order to reach this target timeline, Montana has provided the following Gantt chart timeline below:

Exhibit 58: Estimated timeline to universal service



As previously outlined, there are several barriers to reaching Montana's goal of reliable, affordable internet available to all serviceable locations. Overall obstacles to broadband deployment are listed in Section 4, and several specifically apply to the speed at which universal services may be achieved, including:

- **Labor gap (Section 4.4)**
- **Supply chain issues (Section 4.5)**
- **Industry participation (Section 4.6)**
- **Delays in federal inputs and feedback:** There are several Montana milestones that could delay universal service due to delays from federal inputs and processes, including:
    - Delays in FCC National Broadband Maps release and BEAD allocation announcements
    - Delays in Five-Year Action Plan, Initial Proposal and Final Proposal approvals

- Delays in funds disbursement after Initial or Final Proposal approvals
- Delays in guidance from Federal Program Officer during key stakeholder engagement periods

5.6 Estimated Cost for Universal Service

This section answers the questions: Where does funding come from, what cost strategies exist that could allow Montana to provide internet access to those unserved, then those underserved, and what assumptions were made in the process?

In keeping with the BEAD NOFO, Montana has analyzed the estimated amount of subsidy needed to serve all unserved and upgrade all underserved in Montana with fiber. However, since Montana is not anticipated to have sufficient funding to connect all unserved and underserved locations with fiber, the MBO has developed additional deployment scenarios that will achieve the BEAD requirement of connecting the unserved while also expanding high-speed internet to as many Montanans as possible. The following scenarios for broadband deployment provide different levels of access for unserved and underserved populations. They all attempt to prioritize both fiber and access for unserved populations. Montana plans to engage with external stakeholders within the state to align on any additional scenarios the state should consider for the Five-Year Action Plan, Initial Proposal and Final Proposal.

Table 12: Scenarios and Projected Outcomes

Scenario	Description	Projected Outcome
1. Broadband Access Through Fiber to Most Unserved	Use fiber exclusively to connect as many unserved locations as possible. It does not utilize an extremely high-cost threshold and assigns fiber in ascending order of cost per location until the financial allocation runs out	99.5% (63.1K) of unserved locations connected with fiber. 360 locations remain unserved. 24K locations remain underserved
2. Broadband Access to All Unserved	Serve all unserved locations with a mix of fiber, fixed wireless, and satellite. Use an extremely high-cost threshold for fiber to reserve allocation for alternative technologies to serve any extremely high-cost fiber locations	100% (63.4K) of unserved locations connected with 99.4% fiber, 0.1% fixed wireless, 0.5% satellite. 24K locations remain underserved
3. Broadband Access to All Unserved and All Underserved	Serve all unserved and underserved locations with a mix of fiber, fixed wireless, and satellite. Use an extremely high-cost threshold that	100% of unserved locations (63.4K) connected with 98.7% fiber, 0.2% fixed

	allows all unserved and underserved locations to be served with fiber or an alternative technology	wireless, and 1.1% satellite, and 100% (24K) of underserved locations upgraded with 99.8% fiber, 0.1% fixed wireless, and 0.1% satellite

5.6.1 Cost Scenario Deep Dives

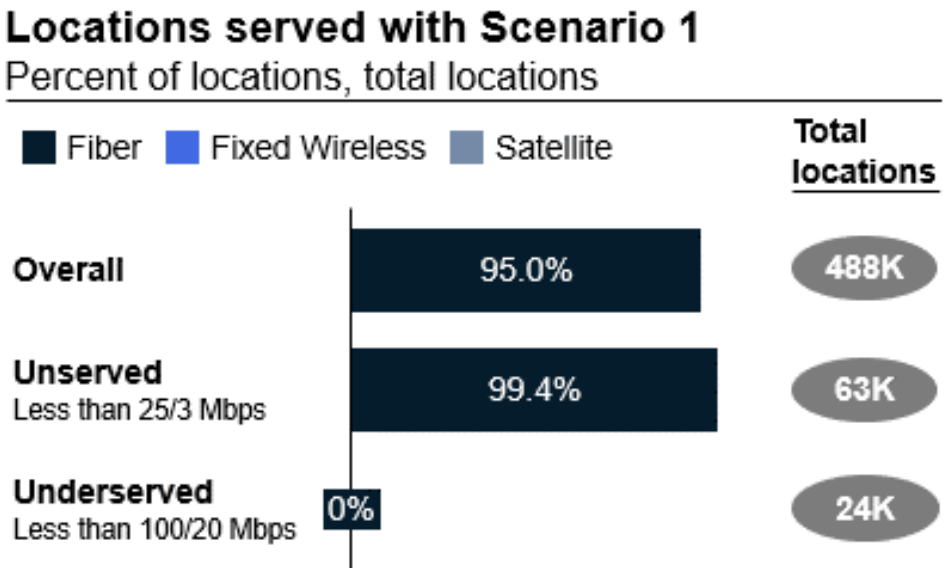
5.6.1.1 Broadband Access Through Fiber to Most Unserved

This section answers the question: Within the anticipated allocation envelope, what percent of unserved locations can be connected using only fiber?

In this scenario, Montana would use fiber as the only technology subsidized and prioritize serving the most unserved locations as possible. Per Section 3.4.1.2, Montana would need an estimated subsidy allocation of $628-754M to serve all unserved locations, while Montana's estimated BEAD allocation is currently $635M.

Given the estimated BEAD allocation ($635M, see Exhibit 59 below), this scenario implies that 99.5 percent (63.1K) of Montana's unserved locations could be served with fiber. However, 0.5 percent (360) of Montana's unserved locations and all its underserved locations (24K) would not receive BEAD allocation subsidies.

Exhibit 59: Locations served with Scenario 1, percent of locations and total locations (thousands)[106]



This scenario implies that at least 27 percent more individuals per covered population (e.g., aging, veteran, Native American, non-White, individual below 200 percent of the FPL) will be residing in a census block group with at least 90 percent served broadband availability. This scenario implies that at least 32 percent more households who have an individual with a

[106] Service availability data provided by FCC Broadband Map as of November 18, 2022. Cost data provided by BroadbandLab licensed data provider as of November 18, 2022

disability will be residing in a census block group with at least 90 percent served broadband availability. Rural locations also see an increase of 20 percent in availability.

Exhibit 60: Scenario impact on individuals in Covered populations, percent of population within census block groups with service availability ≥90 percent[107]

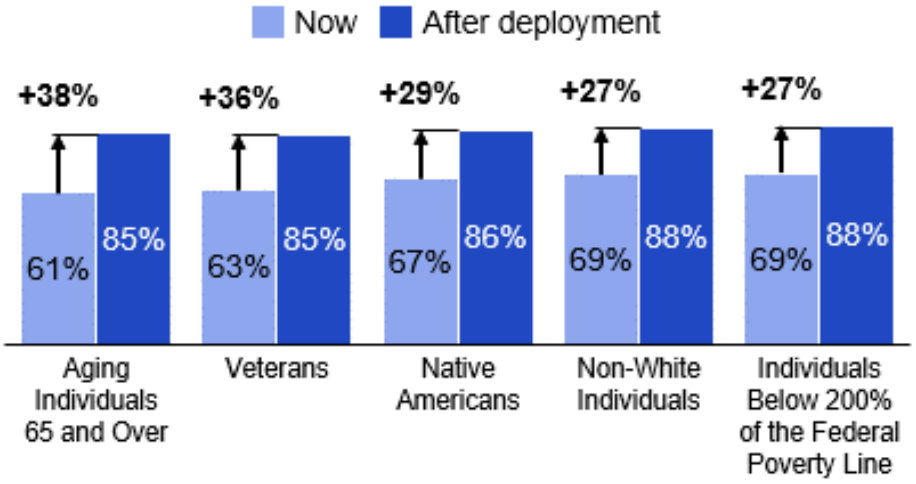
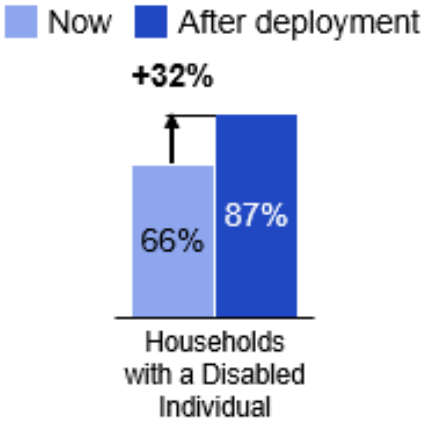
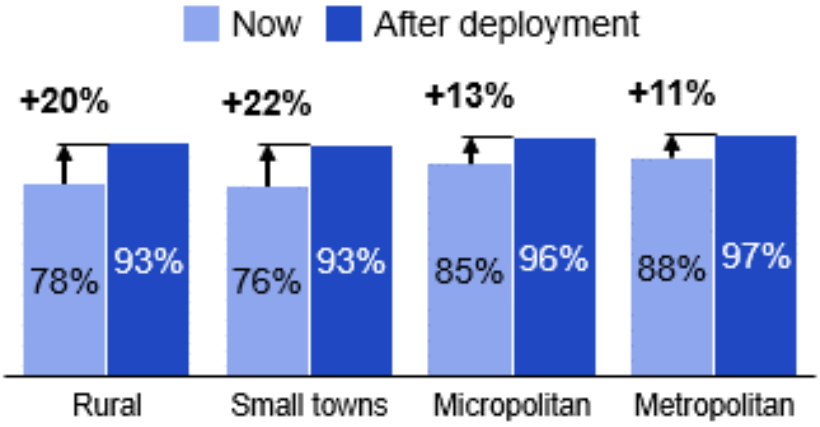


Exhibit 61: Scenario impact on households with a disabled individual, percent of population within census block groups with service availability ≥90 percent[108]



[107] Service availability data provided by FCC Broadband Map as of November 18, 2022. Cost data provided by BroadbandLab licensed data provider as of November 18, 2022. US Census Bureau
[108] Service availability data provided by FCC Broadband Map as of November 18, 2022. Cost data provided by BroadbandLab licensed data provider as of November 18, 2022. US Census Bureau

Exhibit 62: Scenario impact on locations based on their percent of locations with 'served' status[109]



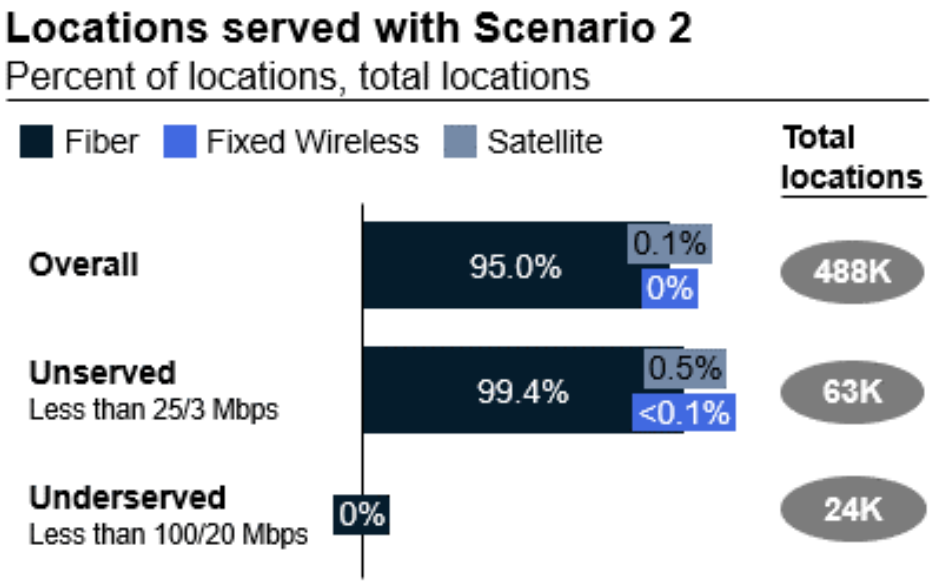
[109] Service availability data provided by FCC Broadband Map as of November 18, 2022. Cost data provided by BroadbandLab licensed data provider as of November 18, 2022; US Census Bureau

5.6.1.2 Broadband Access to All Unserved

This section answers the question: Within the anticipated allocation envelope, how can Montana supply broadband access to all unserved locations using a mix of technologies?

Like the previous scenario, unserved locations receive priority BEAD funding. To ensure all unserved locations receive broadband access, Montana would set an extremely high-cost threshold of $206K per location. This should ensure fiber meets the greatest number of unserved locations as possible while still ensuring all unserved locations can receive access through other technologies. With the $206K per location extremely high-cost threshold, 100 percent of unserved locations are implied to be served. However, all BEAD allocation is used for unserved deployment and assumes no underserved locations would be upgraded. The technology mix for unserved locations is approximately 99.4 percent fiber, 0.1 percent fixed wireless, and 0.5 percent satellite. 63.4K unserved locations would be provided fiber.

Exhibit 63: Locations served with Scenario 2, percent of locations and total locations (thousands)[110]

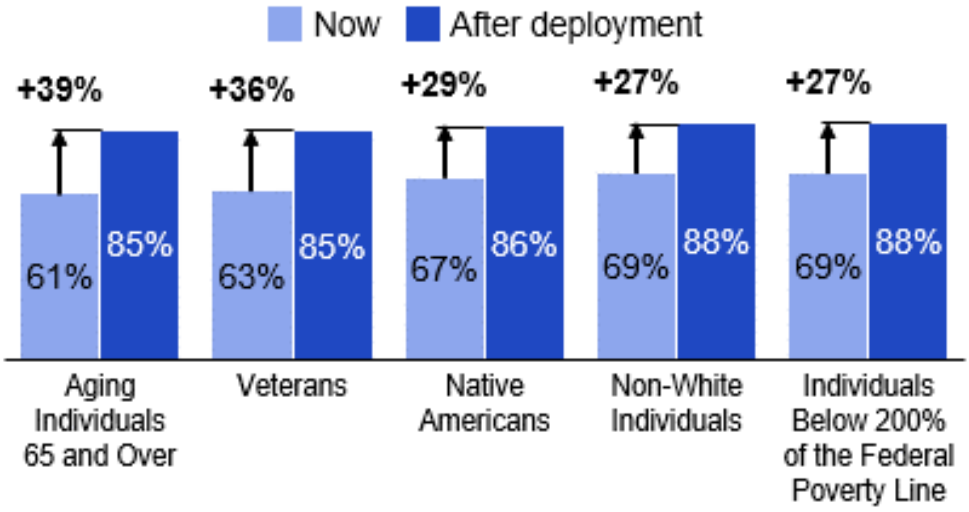


[110] Service availability data provided by FCC Broadband Map as of November 18, 2022. Cost data provided by BroadbandLab licensed data provider as of November 18, 2022

Exhibit 64: Total BEAD subsidy required for Scenario 2, $M[111]

This scenario implies that at least 27 percent more individuals per covered population (e.g., aging, veteran, Native American, non-White, individual below 200 percent of the FPL) will be residing in a census block group with at least 90 percent served broadband availability. This scenario also implies that at least 33 percent more households who have an individual with a disability will be residing in a census block group with at least 90 percent served broadband availability. Rural locations also see an increase of 20 percent in availability.

Exhibit 65: Scenario impact on individuals in covered populations, percent of population within census block groups with service availability ≥90 percent [112]



[111] Service availability data provided by FCC Broadband Map as of November 18, 2022. Cost data provided by BroadbandLab licensed data provider as of November 18, 2022. US Census Bureau
[112] Service availability data provided by FCC Broadband Map as of November 18, 2022. Cost data provided by BroadbandLab licensed data provider as of November 18, 2022. US Census Bureau

Exhibit 66: Scenario impact on households with a disabled individual, precent of population within census block groups with service availability ≥90 percent[113]

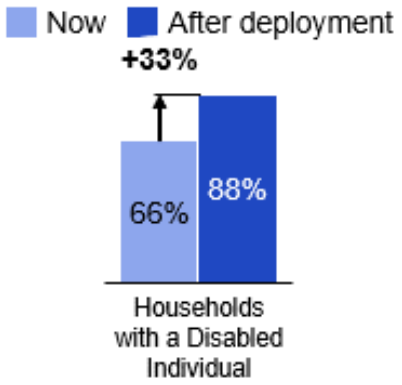
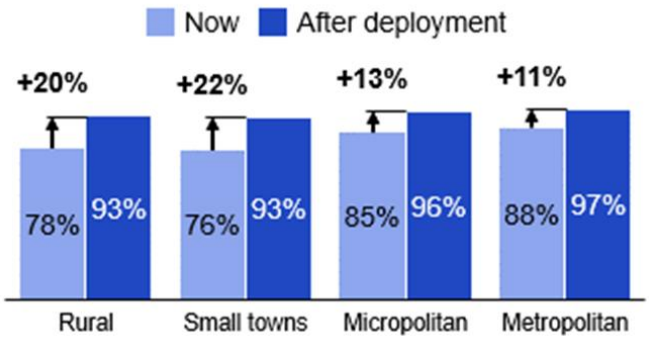


Exhibit 67: Scenario impact on locations based on their percent of locations with 'served' status[114]



[113] Service availability data provided by FCC Broadband Map as of November 18, 2022. Cost data provided by BroadbandLab licensed data provider as of November 18, 2022. US Census Bureau
[114] Service availability data provided by FCC Broadband Map as of November 18, 2022. Cost data provided by BroadbandLab licensed data provider as of November 18, 2022. US Census Bureau

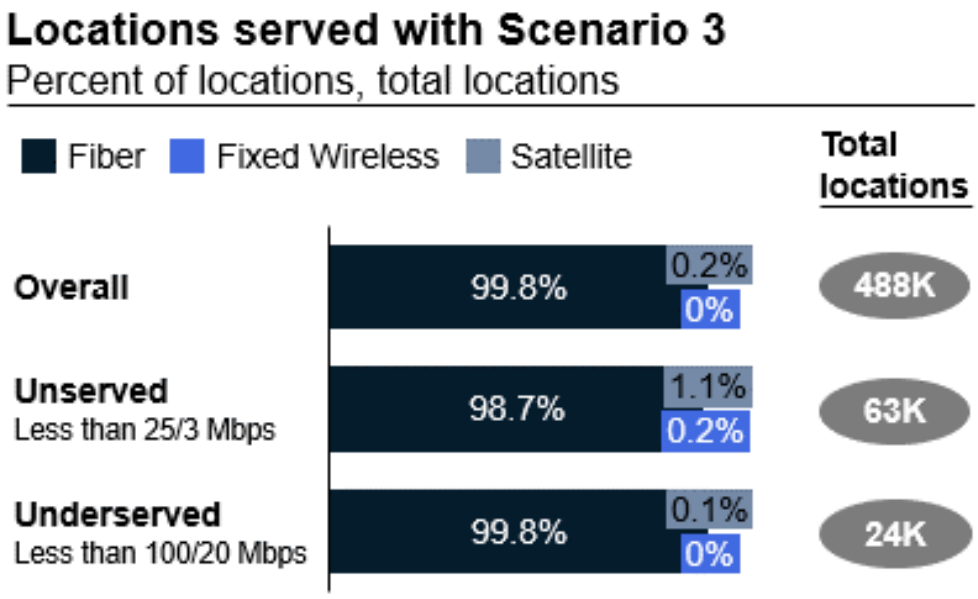
5.6.1.3 Broadband Access to All Unserved and Underserved

This section answers the question: Within the anticipated allocation envelope, what percent of underserved locations could be served if Montana scales back fiber deployment in unserved locations to 97 percent?

Like the previous scenario, unserved locations receive priority BEAD funding and will use a mix of technologies to serve all unserved. However, Montana would set an extremely high-cost threshold of $151K per location to limit prohibitively expensive fiber and create reserve allocation for alternative technology usage for the unserved and provide additional allocation ($69M) to provide internet to the underserved. With the $151K per location extremely high-cost threshold, the scenario implies that 100 percent of unserved locations would be served, with 62.6K (98.7 percent) unserved locations provided fiber. The technology mix for unserved locations is approximately 98.7 percent fiber, 0.2 percent fixed wireless, and 1.1 percent satellite.

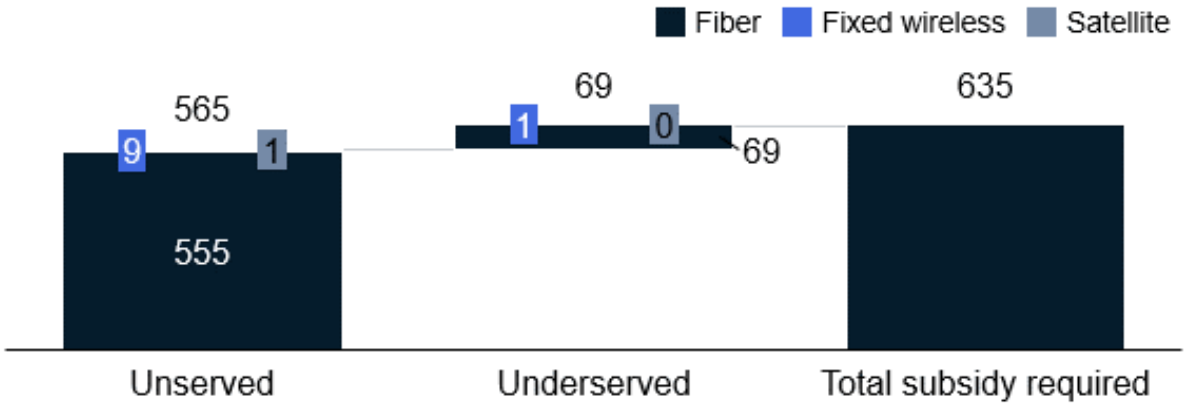
Additionally, all 24K underserved locations would be served, with 23.9K (99.8 percent) underserved locations receiving fiber, and the remaining 38 (0.1 percent) underserved locations receiving either fixed wireless or satellite.

Exhibit 68: Locations served with Scenario 3, percent of locations and total locations (thousands)[115]



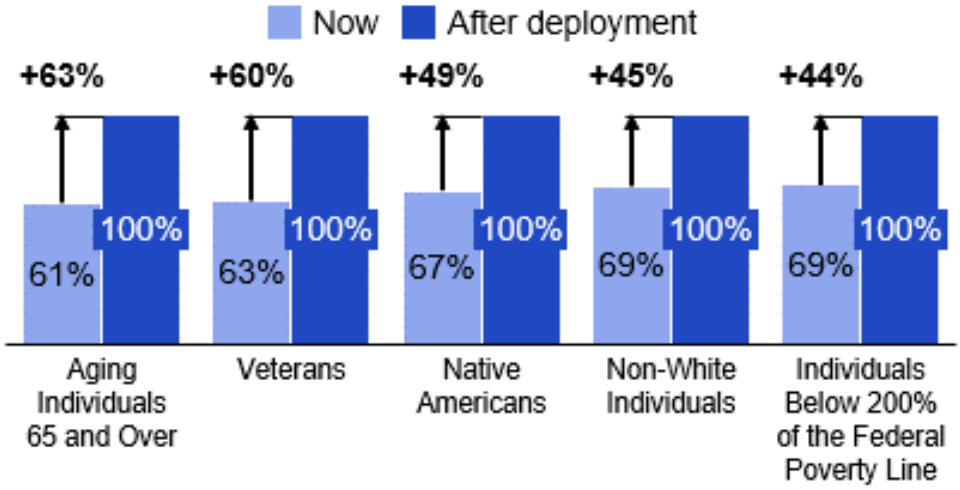
[115] Service availability data provided by FCC Broadband Map as of November 18, 2022. Cost data provided by BroadbandLab licensed data provider as of November 18, 2022

Exhibit 69: Total BEAD subsidy required for Scenario 3, $M[116]



This scenario implies that all individuals per covered population (e.g., aging, veteran, Native American, non-White, individual below 200 percent of the FPL) will be residing in a census block group with at least 90 percent served broadband availability. This scenario also implies that all households with a disabled individual will be residing in a census block group with at least 90 percent served broadband availability. All rural locations will also have served broadband availability.

Exhibit 70: Scenario impact on households in covered populations, percent of population within census block groups with service availability ≥90 percent [117]



[116] Service availability data provided by FCC Broadband Map as of November 18, 2022. Cost data provided by BroadbandLab licensed data provider as of November 18, 2022
[117] Service availability data provided by FCC Broadband Map as of November 18, 2022. Cost data provided by BroadbandLab licensed data provider as of November 18, 2022; US Census Bureau

Exhibit 71: Scenario impact on households with a disabled individual, percent of population within census block groups with service availability ≥90 percent[118]

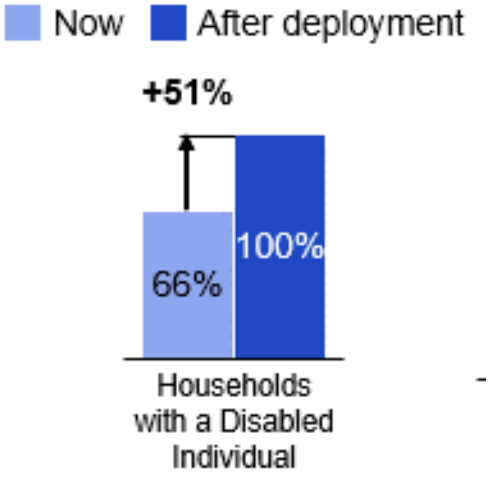
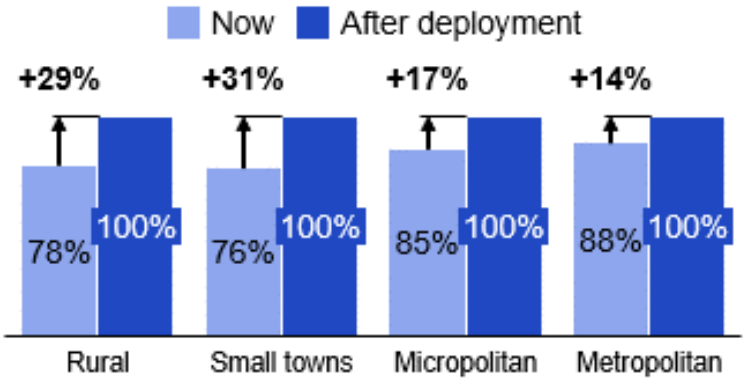


Exhibit 72: Scenario impact on locations based on their percent of locations with 'served' status[119]



[118] Service availability data provided by FCC Broadband Map as of November 18, 2022. Cost data provided by BroadbandLab licensed data provider as of November 18, 2022; US Census Bureau
[119] Service availability data provided by FCC Broadband Map as of November 18, 2022. Cost data provided by BroadbandLab licensed data provider as of November 18, 2022; US Census Bureau

5.6.2 Cost Scenario Assumptions and Relevant Information

Funding

- Each cost scenario assumes a total federal BEAD allocation of $635M to connect all unserved and underserved locations in Montana. The $635M BEAD allocation is based on current estimates of high-cost unserved locations in Montana when compared to the rest of the United States
- Locations that are served by an enforceable commitment with the following programs are marked as served in Montana's scenario analysis:
    - RDOF
    - USDA RUS / Reconnect (up until January 2022 awards)
    - CAF II
    - NTIABIP
- Additional funding sources will be included in Montana's future service availability and scenario analysis that will contribute to Montana's Initial Proposal and Final Proposal. The following broadband programs will be included in future analyses:
    - ARPA
    - USDA Reconnect (post-January 2022 awards)

Definitions and Technology Mix:

- Montana service availability estimates are based on BEAD definitions of served (speeds greater than 100 Mbps downstream/20 Mbps upstream), underserved (less than 100 Mbps downstream/20 Mbps upstream but greater than 25 Mbps downstream/three Mbps upstream) and unserved (less than 25 Mbps downstream/three Mbps upstream)
- Montana has explored several deployment scenarios, some of which include a mix of potential technologies including fiber, fixed wireless and satellite. Fiber is prioritized up to the extremely high-cost threshold in each scenario. If the cost of Fiber exceeds the threshold, Fixed Wireless is used as an alternative up to the extremely high-cost threshold in each scenario. If the cost of both Fiber and Fixed Wireless exceed the threshold, Satellite is selected as a potential technology

Subsidy Estimate:

- Montana will receive an allocation from the NTIA to deploy federal dollars, provided under BEAD, to promote maximizing internet availability and provide subsidies to incentivize ISPs (BEAD allocation subgrantees) to serve unserved and underserved areas. The estimated subsidy required by the BEAD allocation per location to incentivize subgrantees to build reflects several factors, including, but not limited to:

- Expected match by a subgrantee (i.e., amount a subgrantee may be able to cover with their own funds) based on the discounted future cash flows over ten years
- Expected capital expenditure deployment costs:
  - **Fiber**: Investment required to acquire, engineer, and install new fiber access networks up to the drop terminal at each location. Several factors included for each location's capital expenditure cost, including linear density, terrain, cost differentials, large area densities, distance to central cores/access to roads, etc.
  - **Fixed wireless**: Investment to acquire, engineer and install a new fixed wireless broadband network including equipment at each location such as receiver antenna, cabling, and equipment. Several factors included for each location's capital expenditure cost, including linear density, terrain, cost differentials, large area densities, distance to central cores/access to roads, etc.
  - **Satellite**: Investment to acquire, engineer and install satellite internet access at a singular location (estimated $881 per location). This cost does not consider recurring monthly costs

- Montana unserved/underserved estimates are based on the FCC Broadband Map released November 18, 2022[120]
- Montana's optimization model will be updated and refined based upon the release of any future FCC National Broadband Maps
- Fiber cost modeling for Montana assumes a plant mix representative of how wireline networks have historically been deployed in Montana
- Fiber cost modeling is based on 'greenfield' fiber estimates (i.e., utilizing new infrastructure for all buildouts instead of using previous infrastructure to upgrade)

[120] Current draft Five Year Action Plan based on service availability data provided by FCC Broadband Map as of November 18, 2022. Cost data provided by BroadbandLab licensed data provider as of November 18, 2022.

5.6.3 Cost Scenario Conclusion

The four scenarios outlined above are a starting point for Montana's BEAD deployment efforts. As such, the numbers will change once the following information is finalized, released and incorporated into Montana's deployment models:

- Locations to be served under additional funding allocations (e.g., ARPA, USDA Reconnect) are incorporated into the Montana broadband map
- Release of updated FCC maps up until the time of the Initial Proposal submission
- Definition of specific project areas for deployment

In addition, the following factors could further change the deployment scenarios and the expected numbers:

- Additional changes or adjustments to underlying cost assumptions in Montana's cost models
- Inflation-related increases due to economic uncertainty
- Current modeling does not consider that some unserved and underserved locations may or may not be located near served and/or potentially profitable areas
    - When ISPs are contracted, some served, unserved and underserved locations could be grouped together, potentially overvaluing the subsidy required to provide incentive for ISPs to connect and upgrade the unserved and underserved locations in the area
- Infrastructure that may be able to be used to reduce estimated capital expenditure costs (i.e., use of 'brownfield' capital equipment to reduce subgrantee and BEAD allocation investment)

When more information is present and incorporated, and further stakeholder feedback is gathered, Montana will narrow down the scenarios to the one that will best suit Montana's needs and gaps. These updates will be included in final drafts of the BEAD Five-Year Action Plan (if available at time of submission), the Initial Proposal and the Final Proposal.

5.7 Alignment

This section answers the question: how will broadband deployment and Digital Opportunity support and advance Montana's existing and planned efforts?

As mentioned above in Section 3.4.2.4, Multi-sector strategies to further broadband adoption, achieving the state's vision for broadband deployment and Digital Opportunity outlined above will support and advance a number of Montana's broader existing and planned efforts and goals related to economic and workforce development, education, health, civic and social engagement, and the delivery of other essential services.

Successfully implementing the BEAD Plan will require coordination between the Department of Administration Broadband Office and other Montana government departments. The Montana Broadband Office's governance model will facilitate alignment between the BEAD Plan and Montana's other existing priorities and efforts across a number of dimensions.

5.7.1 Alignment with the Digital Opportunity Plan

Montana's BEAD Plan has been developed concurrently with the Digital Opportunity Plan, and the Digital Opportunity components of this plan draw from the Digital Opportunity Plan. Since the MBO is responsible for both plans, the state will work cohesively to meet their shared objectives. Community stakeholders have also been approached in a coordinated fashion for their input on broadband deployment and digital opportunity. The digital opportunity goals of the BEAD Plan are consistent with (though not identical to) the goals of the Digital Opportunity Plan; they address the covered populations that are prioritized in the Digital Opportunity Plan. Montana considers that this BEAD Plan sets forth a vision for digital opportunity that is fully consistent with, and further elaborated in, its state Digital Opportunity Plan.

5.7.2 Alignment with Other State Priorities

Achieving the state's vision for digital opportunity outlined above will support and advance a number of Montana's broader existing and planned efforts and goals related to economic and workforce development, education, health, civic and social engagement, and the delivery of other essential services.

5.7.3 Economic and workforce development

Montana's strategies to bolster its economy and develop its workforce are largely dependent on and will be advanced by increased access to broadband and closing the digital divide. Resources to develop skills, find jobs, and conduct business are increasingly located online. As such, adequate broadband is a vital component to a thriving economy and workforce. The BEAD Plan's goals in closing the digital divide by making broadband accessible and affordable will bolster Montana's short- and long-term plans for its economy and workforce, as detailed below.

Come Home Montana

Description

In 2021, Gov. Gianforte announced Come Home Montana, a state-wide effort to encourage Montanans to take advantage of remote work opportunities and return home to Montana from other states. Affordable access to high-speed internet is essential to successfully working remotely, which was referenced in a statement[121] from the governor's office: "To bridge the digital divide and make working remotely more accessible than ever, the administration is in early stages of deploying $275 million for broadband expansion. In addition to highlighting opportunities for remote work and employment, the campaign highlights the value of a Montana education."

These funds were awarded to the State of Montana by the American Rescue Plan Act for the "expansion of broadband Internet access to Montana's regions and locals that remain unserved or underserved." The Department of Administration has established ConnectMT to oversee the operation of the award process, as the funds will be allocated "via competitive allocation awards

[121] "Gov. Gianforte Launches Come Home Montana Campaign," Governor's Office, https://news.mt.gov/Governors-Office/gov-gianforte-launches-come-home-montana-campaign

to applicants who commit at a minimum 20 percent of the proposed project's funds cost and who also commit to deploying enhanced and improved internet communications in Montana."[122]

The implementation of both the BEAD and Digital Opportunity Plans will also create jobs to build and support broadband infrastructure and supporting programs, which may incentivize Montanans to return to live and work in the state, helping to fill labor gaps needed for broadband deployment and ongoing implementation.

Montana Registered Apprenticeship

Description

Governor Gianforte has prioritized growing the Montana Registered Apprenticeship Program, a key workforce development initiative, which has greatly accelerated over the last year and currently has more participants than the previous three years combined.[123] The program provides paid, on-the-job training that teaches specific and technical job skills unique to the employer's profession, and upon completion, participants receive a Montana Registered Apprenticeship Program[124] completion certificate, which is recognized in all 50 states.

The program was designed to create a skilled labor force to take advantage of Montana's employment opportunities. Annually in Montana, around 14,000 students graduate from high school, 6,000 of whom go directly to work without meaningful credentials that could help them secure skilled, well-paying positions. In an effort to support those students, the state developed Montana Registered Apprenticeships, which pairs students with employers, provides them paid, on-the-job training, and positions them to attain gainful employment. This effort is reimagining high school for nontraditional students who would likely not attend college upon graduation. Pilot programs have been developed for construction, manufacturing, healthcare, technology, restaurants, and hospitality.

The Montana Broadband Office may explore opportunities for students to participate in apprenticeships to learn about how to deploy broadband infrastructure and provide ongoing technical support as high-speed internet is expanded throughout Montana in accordance with the BEAD and Digital Opportunity plans.

To learn about and enroll in the program, students use an online portal, which further highlights the importance of a digitally connected Montana.

Accelerate Montana

Description

By using a skills-focused hiring process, Accelerate Montana helps organizations identify their hiring needs while offering them a pool of candidates with the skills they are looking for. The organization is partnering with employers to build programs based on their needs and the needs

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[122] ConnectMT ARPA Application, https://commerce.mt.gov/_shared/ARPA/docs/Communications/20211118/ConnectMTApplicationSubmittable.pdf
[123] Interview with Workforce Services Division, Montana Department of Labor & Industry, October 31, 2022
[124] Montana Registered Apprenticeships, https://apprenticeship.mt.gov/

of their employees.[125] This public-private partnership provides Rapid Training courses, which can be taken in person, online, or hybrid through various Montana colleges.

As the BEAD and Digital Opportunity plans are implemented, there may be opportunities for Accelerate Montana to provide rapid upskilling to residents interested in filling the labor gap created by the need to expand broadband infrastructure and administer ongoing support.

Montana Comeback Plan

In the wake of the pandemic, Governor Gianforte developed The Montana Comeback Plan[126] to reenergize the Montana economy.

The Governor's plan acknowledges the promise of the technology sector and the power of widespread, high-speed internet access. According to the plan, "the high-tech sector, which now exceeds $2 billion per year in revenue in Montana, is our fastest growing industry, and creates jobs that pay double the state average." The infrastructure buildout and subsequent support and service detailed in the BEAD Plan could create between 2,000 and 4,000 jobs.

The plan also notes that, "With broadband Internet, tech businesses can be in any Montana community and Montanans can return home, bringing remote work jobs with them to revitalize our rural communities. We should be encouraging high tech to complement our other strong Montana industries and expanding rural broadband to enable it."

The challenges faced by Montana, and particularly rural populations, are referenced: "Montana lags other states in access to broadband … one in three Montanans do not have access to broadband, which is three times the national average. The digital divide is even greater in our rural communities where three in five Montanans do not have access to broadband."

Additionally, the increased reliance on broadband for work, healthcare, and education is acknowledged: "As a result of the coronavirus crisis, Montanans are increasingly teleworking, patients are relying on telemedicine to consult with their doctors remotely, and students are studying and taking classes online—all making the lack of access across our state more pronounced."

The Comeback Plan plainly states that bringing reliable broadband to all of Montana is a key priority for the state, as it's "time we give rural Montana access to the same opportunities the rest of the state has. We have to bring reliable broadband to all our Montana communities. Deploying broadband to our rural areas is foundational for our new and evolving economy, whether it's ag or high-tech."

As outlined clearly in the Montana Comeback Plan, many of the state's overarching priorities—skilled workforce development, and remote access to education, work, and healthcare—relies on widespread access and use of high-speed internet.

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[125] Accelerate MT, https://www.acceleratemt.com/rapid-training-program
[126] Montana Comeback Plan, https://gregformontana.com/wp-content/uploads/2020/08/Montana-Come-Back-Plan.pdf

5.7.3.1 Education

Given Montana's rurality and low population density, digital instruction is a powerful tool in providing students with the educational opportunities they deserve. In many places, there is a dearth of instructors trained to provide classes required or desired by students. By improving access to broadband, Montana will make it possible for students in remote areas to take online classes they would not otherwise be able to access. This is highlighted in the state's education plans outlined below.

Montana Board of Public Education Strategic Plan 2022-2023[127]

Description

A main objective of the State of Montana's Board of Public Education Strategic Plan is to collaborate with the Montana Digital Academy, the state online program for Montana, supporting instruction for Montana students in partnership with public schools across the state, to support online instruction for students.

The Montana Digital Academy[128] allows the state's students to access their classes from any place and at any time, greatly enhancing learning opportunities. The Academy's extensive course catalog, "expands access to Advanced Placement® and specialized elective courses, especially for our rural schools."

Broadband deployment will support the Academy's agenda, broadening learning opportunities for Montana's students.

Montana School for the Deaf and Blind Education Program Overview[129]

Description

Many of the students who attend and use resources provided by the Montana School for the Deaf and Blind (MSDB) sit at the intersection of two of the most vulnerable covered populations, residing in rural areas and living with disabilities like vision or hearing impairments.

To learn and to communicate, these children rely on internet, specialized devices, and software, many of which are unavailable to them because of both lack of access and affordability. MSDB's program overview prioritizes the availability of "tools, such as amplification technology and communication strategies," as well as "access to technology depending on individual student need."

MDSB needs adequate broadband to broadcast its lessons to students who live in remote areas of the state. According to Paul Furthmyre, the school's administrator, MSDB's visually impaired students rely on devices with software that can translate written word into sound to help them navigate lessons or their device screens. Students with hearing impairments require high-speed internet to support their Zoom classes, as they sign on screen. Insufficient broadband speeds

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[127] Board of Public Education Strategic Plan 2021-22, https://bpe.mt.gov/Home/Approved-BPE-Strategic-Plan-2021.pdf
[128] Montana Digital Academy, http://montanadigitalacademy.org/
[129] Montana School for the Deaf and the Blind, https://www.msdbmustangs.org/education/education-program-overview/

result in video lags, which can cause students to miss 20-30 percent of instruction, impeding their ability to participate fully in their lessons.

Through ARPA allocations, MDSB will receive high-speed internet through fiber before 2025.

The BEAD Plan's efforts to increase broadband and device availability and affordability will directly support MDSB's education goals, by enabling students to fully participate in their classes, and by expanding the school's ability to train additional instructors around the state to magnify MDSB's impact.

Montana Office of Public Instruction Initiatives[130]

Description

Several of the Montana Office of Public Instruction's (OPI) initiatives will be bolstered by the BEAD Plan, including increasing "family, student, and community engagement," which could be made more robust via digital engagement.

OPI is also keen to "expand industry, military, and post-secondary partnerships," which intersects with the Montana Registered Apprenticeship program that uses an online portal to connect prospective participants to potential sponsors.

Further, OPI's initiative to emphasize "STEM, career and technical education (CTE), and workforce development, beginning in middle school," will require the use of digital equipment and broadband access, both prioritized by the BEAD Plan.

OPI's STEM goals are underscored by First Lady Susan Gianforte's priority of "increasing opportunities for Montana kids to explore Science, Technology, Engineering and Math (STEM) education." She notes that, "students who engage in STEM education learn how to solve complex problems, boost their self-confidence, and discover doors to greater opportunities."[131]

OPI's initiatives in STEM, CTE, and workforce development may function symbiotically with the labor gap that exists related to the state's effort to build broadband infrastructure and provide necessary support services. By collaborating on programming, Montana can build a skilled labor force that can support the state's broadband efforts.

5.7.3.2 Health

The State of Montana includes miles of expansive and sparsely populated land. Many residents live in remote areas, many hours away from healthcare facilities. Making the trip for run-of-the-mill checkups can be both time consuming and costly. For rural Montanans in particular, telehealth may be the key to making healthcare affordable and accessible. Increasing the availability of affordable high-speed internet can support the state's telehealth goals, as highlighted in the Department of Public Health and Human Services (DPHHS)'s plans.

Montana Department of Public Health and Human Services

Description

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[130] Office of Public Instruction Initiatives, https://opi.mt.gov/Portals/182/Superintendent-Docs-Images/OPI%20Initiatives.pdf?ver=2018-08-13-112844-533
[131] Treasure State Foundation, https://treasurestatefoundation.org/our-initiatives/

The Montana Department of Public Health and Human Services (DPHHS) is prioritizing the continued expansion of telehealth services for behavioral health, primary care, and other health-related needs and recognizes telehealth's importance in increasing access to timely, affordable, and effective health services.[132] Given Montana's vast area and low population density, residents—particularly in rural areas and on tribal reservations—face considerable barriers to accessing medical care. These geographic challenges not only impede residents' access to healthcare, but to other essential services, including those offered by Child Protective Services (CPS) and the Office of Public Assistance (OPA). With adequate broadband and internet-capable devices, these Montanans could access these services remotely, saving a great deal of time and resources, which would in turn encourage more frequent use.

Lack of broadband and cell service is also a challenge for state agency employees. CPS representatives often lose connectivity when driving to Eastern Montana to conduct wellness checks, posing serious security challenges. OPA employees face obstacles enrolling residents in programs like SNAP or Medicaid often travel upwards of 100-150 miles to provide support that could be easily offered online. Many of the agencies overseen by DPHHS are understaffed and under-resourced, lacking the technical equipment, such as signal boosters, hotspots, and tablets, necessary to perform their duties. Broadband access and the proper internet-capable devices would significantly improve these employees' ability to conduct their business and their safety while doing so.[133]

Montana State Rural Health Plan[134]

Description

The Montana State Rural Health Plan stresses the importance of access to and use of telehealth in serving Montana's largest covered population, rural individuals. The plan notes that, "Much of Montana remains in a broadband desert. In many of these areas, internet connections that are not sufficient to maintain a live video call are all too common."

Main goals of the Rural Health Plan include expanding telehealth for rural populations and veterans, encouraging providers and health care facilities to adopt and use telehealth, and increasing access to behavioral health telehealth services.

Individuals who live in rural areas may lack the time and resources necessary to travel long distances—sometimes several hours—to visit healthcare professionals, particularly for ailments that could be addressed through a video call. By increasing ease of access to telehealth, rural residents may feel encouraged to address their health issues faster or more frequently, leading to better outcomes in the short- and long-term.

5.7.3.3 Civic and social engagement

In today's world, people count on online platforms to connect with friends and family, explore their interests, and participate in their communities. Many of the State of Montana's plans

[132] Interview with the Department of Health and Human Services, November 10, 2022
[133] Interview with the Department of Health and Human Services, November 10, 2022
[134] Montana's Rural Health Plan 2021, Montana Department of Public Health & Human Services, https://dphhs.mt.gov/assets/qad/FlexGrantStateRuralHealthPlan.pdf

related to civic and social engagement include utilizing digital platforms to make access easier for residents, which can be supported by increased access to affordable broadband.

Secretary of State Biennium 2023-2025[135]

Description

Montana's secretary of state has made the deployment and use of electMT, an updated election system, a key priority ahead of the next wave of elections. Currently, there is no online system for local elections, but with electMT, voters will be able to check their ballot status and the election reporting systems will be tied into each other. As voting is central to civic engagement, implementing this new system will further enfranchise Montana's citizens.

The BEAD Plan's deployment of broadband will help make electMT successful and scalable.

Montana Fish, Wildlife, and Parks Goals[136]

Description

Fishing, hunting, and spending time in the great outdoors are central tenets of life in Montana. The Montana Fish, Wildlife, and Parks agency has prioritized replacing its Automated Licensing System "to provide a comprehensive business and customer service portal for hunting, angling, and recreation opportunities."

Hunters and fishers rely on affordable and accessible broadband and devices to access this updated system.

5.7.3.4 Delivery of other essential services

In July 2022, Governor Gianforte issued the Digital First challenge[137] to all of Montana's state agencies to become 100 percent digitized. The Governor noted that, "Modernizing state government is critical to better serving our customers, the people of Montana, and being better stewards of their hard-earned money. By adopting a culture of customer service across state agencies, we are changing the way state government does business. By transforming state government to digital, we'll better serve Montanans while also saving taxpayers millions along the way."

The BEAD Plan's objectives of increasing the availability of high-speed internet will support the state agencies' transition to online platforms, enable residents to take advantage of the agencies' online services, and also advance additional goals laid out in the plans detailed below.

Montana Department of Livestock Goals and Objectives[138]

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[135] Montana Secretary of State 2023-2025 Biennium, https://sosmt.gov/wp-admin/admin-ajax.php?juwpfisadmin=false&action=wpfd&task=file.download&wpfd_category_id=775&wpfd_file_id=48194&token=b0e72f88d5ec849828e7397b4a41626b&preview=1

[136] Montana Fish, Wildlife and Parks, https://fwp.mt.gov/aboutfwp/goals-and-objectives

[137] "Commerce First To Meet Governor Gianforte's Digital Challenge," Governor's Office, https://news.mt.gov/Governors-Office/Commerce_First_To_Meet_Governor_Gianfortes_Digital_Challenge

[138] Montana Department of Livestock, https://liv.mt.gov/Goals-and-Objectives

Description

Livestock are at the center of Montana's robust agriculture industry, and two of the Montana Department of Livestock's key goals are keeping "the livestock industry and public informed of industry programs and issues through timely and accurate public information and education," and managing the enforcement of brands. Better connectivity will allow the Department to share much of this information online in a timely fashion.

Department of Motor Vehicles

Description

As the DMV works to make its services more accessible, it has created an online portal to enable Montanans to perform simple services like renewing their driver licenses.

Department of Environmental Quality

Description

The Department of Environmental Quality uses digital resources to keep citizens up to date on pertinent safety guidelines related to air, energy, mining, waste management and remediation, and water quality.

Department of Military Affairs

Description:

The Adjutant General of the Department of Military Affairs, General J. Peter Hronek, explained the importance and value of adequate broadband infrastructure and support as related to emergency and disaster relief in the State of Montana. He noted that the lack of redundancies in the broadband infrastructure makes the state vulnerable before, during, and after disasters: "If one line goes down, everything is down." The inability to communicate quickly with Montana residents puts the state at a disadvantage in conveying warnings ahead of natural disasters and in providing emergency response in the wake of those disasters.[139]

The Department, which also helps veterans access benefits, noted that veterans, who are often older, lack adequate technology at their homes, as well as the digital skills necessary for them to access resources online.

The BEAD Plan's initiatives related to the expansion of broadband availability and digital skills may offer noted benefits to several covered populations with whom the Department of Military Affairs often interfaces—veterans, individuals who live in rural areas, aging populations, and individuals living with disabilities.

5.8 Technical Assistance

[139] Interview with the Department of Military Affairs, October 26, 2022

This section answers the question: what forms of technical assistance will Montana require from the NTIA?

Montana expects a collaborative partnership with the NTIA FPO that takes into account the requirements of the NOFO alongside the realities of implementation in the topographically challenging and dispersed State of Montana. The MBO especially values having a single point of contact to minimize the risk of conflicting guidance.

Montana anticipates that the FPO will provide clear guidance supporting an efficient use of Montana resources with an effort to avoid rework in development of the plan. When an FPO is assigned, MBO will provide context on Montana's progress to date on both the BEAD and Digital Opportunity Plan efforts.

Montana will require meaningful and generative input on items not limited to the following:

- Feedback on Montana's stakeholder engagement process: Montana has designed an extensive stakeholder engagement process to obtain feedback from a wide range of stakeholders and potential partners on the draft Plans. Montana anticipates that this process will more than meet the BEAD requirements for stakeholder engagement.
- Feedback on Montana's proposed timeline: Montana has clearly laid out the timeline by which it anticipates beginning broadband deployment.
- Feedback on Montana's proposed subgrantee process: Montana will design a subgrantee process that aims to be efficient, transparent, and fair.
- Feedback on Montana's Plans and Proposals, including the design choices involving proposed deployment scenarios: while Montana plans to serve as many locations as possible with fiber while also bringing lasting, reliable high-speed internet to all Montanans, some trade-offs are inevitable. Montana anticipates input on the scale and technologies of its proposed deployment.

Montana values timely input on all matters from the NTIA and FCC. In its response to the BEAD Notice of Funding Opportunity, Montana has strategically aimed to move early: as a state with many unserved and underserved locations in rural areas with a relatively high buildout cost, Montana aims to get ahead of any potential labor and supply chain constraints by designing an application process ahead of time and submitting a Five-Year Action Plan ahead of other Eligible Entities. Timely responses from the NTIA are thus essential for Montana's strategy for broadband deployment. Milestones in Montana's plan where input from the NTIA/FCC are required are listed under Section 5.5: Estimated Timeline for Universal Service and color-coded red in the timeline. For instance, for timely broadband deployment, the MBO will require timely approval of plans and proposals, especially as labor and materials shortages may exacerbate the impact of any delays. MBO appreciates the guidance released by the NTIA to date, as well as the mapping data the FCC has released thus far.

6 Conclusion

This Five-Year Action Plan lays out Montana's priorities as it seeks to close the digital divide for all Montanans. As this Five-Year Action Plan details, Montana is engaging with stakeholders and with state agencies in developing a plan for broadband deployment that best serves all Montanans. This Five-Year Action Plan has also been developed in tandem with Montana's Digital Opportunity Plan. Together, the plans aim to bring affordable, accessible broadband and digital opportunity to the State of Montana.

The data presented in these reports represent the lived experience of Montanans across the state, who may vary widely in their income levels, experience with technology, geography they live in, ethnic or racial background, age, etc. Some Montanans have not lived in a world with no internet; others are still adjusting to the increasing ubiquity of internet-enabled services. Some Montanans live in densely populated urban areas, while others live miles away from their nearest neighbors. The MBO's view is that all Montanans need internet access for full participation in our society, democracy and economy, and the MBO's work as part of the BEAD Program aims to make that possible.

7 Appendices

Appendix 1: All KPIs

Objective #	KPI	Baseline	Short-term Goal	Long-term Goal	Data Source	Tracking Frequency	Responsible Entity
1a	# locations served as part of BEAD	# locations	TBD	TBD	ISP submissions	Every 6 months	Chief Data Officer
1b	Cost	$0	TBD	TBD	Program data	Every month	Grant accountant
2	% locations unserved	13%	TBD	0% (as required by NOFO)	Broadband map	Every 6 months	Chief Data Officer
3	% locations underserved	5%	TBD	TBD	Broadband map	Every 6 months	Chief Data Officer
4	% residents with internet-capable device access	91.8%	TBD	TBD	US Census data	Every 12 months	Census and Economic Information Center
5	Household adoption rate	67%	TBD	TBD	US Census data	Every 12 months	Census and Economic Information Center
6	% eligible households enrolled in ACP	21%	TBD	TBD	USAC data	Every 6 months	Program Coordinator
7	% uptake affordable plans	x%	TBD	TBD	ISP submissions	Every 6 months	Program Coordinator
8a	Adoption rate in the rural population	78%	TBD	TBD	US Census data	Every 12 months	Census and Economic Information Center
8b	Adoption rate in the Black population	63%	TBD	TBD	US Census data	Every 12 months	Census and Economic Information Center

Objective #	KPI	Baseline	Short-term Goal	Long-term Goal	Data Source	Tracking Frequency	Responsible Entity
8c	Adoption rate in the Native American population	53%	TBD	TBD	US Census data	Every 12 months	Census and Economic Information Center
8d	Adoption rate in the aging population	58%	TBD	TBD	US Census data	Every 12 months	Census and Economic Information Center
8e	Adoption rate in the veteran population	64%	TBD	TBD	US Census data	Every 12 months	Census and Economic Information Center
8f	Adoption rate in the population with disabilities	55%	TBD	TBD	US Census data	Every 12 months	Census and Economic Information Center
8g	Adoption rate among households who earn less than $20k annually	65%	TBD	TBD	US Census Data	Every 12 months	Census and Economic Information Center
9	% business locations with high-speed internet access	74%	TBD	TBD	Broadband map	Every 6 months	Chief Data Officer