

HIGH SPEED NEVADA

Five-Year Action Plan



September 2023

STATE OF NEVADA

Nevada Governor's Office of Science,
Innovation and Technology



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1. Executive Summary



Our world is becoming ever increasingly connected. Today, students in Nevada can access educational opportunities previously only available to a select few in the most urban areas while their parents work from home or the office with colleagues around the world to tackle big problems. Small businesses in Nevada have access to a global marketplace to sell services and goods. And, Nevadans have access to healthcare specialists previously only available after hours or days of travel. Endless possibilities are made possible by high-speed broadband.

While broadband is becoming as vital to our life today as electricity, not all Nevadans have access to it for a variety of reasons. For example, residents of rural areas in Nevada lack broadband service with the same speeds and reliability as their urban counterparts. Many Nevadans that live in areas with access to readily available broadband service are unable to afford it or a device to access it. Other Nevadans do not access the internet because they lack the digital literacy to do so. In the future, both access to broadband and the knowledge of how to use it will increasingly determine Nevadans' ability to learn, earn, and live well. As such, universal access is our goal and nothing short of it should be acceptable. In this sense,

universal access means all Nevadans have access to affordable broadband service and the tools to help them utilize it.

Although Nevada's broadband gaps predate the pandemic, COVID-19 put a shining spotlight on both the need for broadband and the need for specific strategies to close those gaps. During the pandemic, a broadband connection was the essential connection to school, work, healthcare, higher education and workforce training, assistance programs, government services, worship, and, most importantly, family and friends. The lack of broadband meant being disconnected from school, work, and society. Communities throughout our state that were already hit harder by the pandemic were less resilient and have been slower to recover without broadband. Nevada cannot become truly connected without connecting its most underserved and vulnerable communities.

While Nevada has made significant progress during the last six years to close the digital divide and deploy additional broadband infrastructure, more work is needed. Unprecedented federal funding for broadband infrastructure will come to Nevada and these funds must be put to work strategically, effectively, and efficiently to move Nevada closer to universal access to

broadband. A thoughtful, coordinated, and cohesive effort across sectors, community based organizations and levels of government is required to effectively leverage these funds and achieve the State's goal of universal access.

Beyond leveraging or continuing to leverage one-time and ongoing federal funding programs, closing the digital divide and moving toward universal access will require policy and programmatic changes in some areas and doubling down on existing policies and programs in other areas. Cooperation among State agencies and between the State, local governments, telecommunications providers, philanthropy, and economic development, business, healthcare, public safety, and community stakeholders will be essential. Universal access will require strong partnerships and alignment around shared objectives.

This Five-Year Action Plan establishes Nevada's vision for broadband deployment and digital equity, the goals and objectives, and the priorities, strategies, and activities the State will take to realize our vision. As plans to realize the goals and objectives detailed below are made, equity should be the north star guiding public and private partners' actions and investments.





2. Overview of the Five-Year Action Plan

2.1 Vision

Nevada's vision for Broadband Equity, Access and Deployment is that:

EVERY NEVADAN has access to a high-speed internet connection that is affordable, reliable, and scalable.

The substantial benefits of high-speed internet to individuals, families, and communities are well established. Broadband has the power to deliver to all Nevadans access to learning, healthcare, information, and economic and workforce opportunity previously only available to the wealthiest individuals living in the largest cities across the

globe. Needs for new, modern connectivity infrastructure throughout Nevada to achieve our universal access mandate are significant. Growth and improvements in infrastructure will increase network capacity, speed, reliability, redundancy, and resiliency. Infrastructure investments will also reduce costs and single points of failure, making it possible to offer reliable internet service in markets and locations that are unserved today.

However, infrastructure enhancements alone are insufficient to bridge the digital divide and truly achieve a connected Nevada. We will not realize our vision if Nevadans cannot afford newly constructed high-speed internet connections or don't have access to affordable connected devices or are unable to acquire needed digital skills to confidently and safely use the internet. These three concepts- affordability, device access, and digital skills define digital equity and are essential elements of Nevada's broadband strategy and efforts. Digital equity will be addressed more completely in Nevada's Statewide Digital Equity Plan.

2.2 Goals and Objectives

Nevada's State Broadband Office, the Governor's Office of Science, Innovation and Technology (OSIT) is charged with the realization of the broadband vision put forward above. Created in 2015, OSIT has a long history of interaction with communities in all corners of the state. Building on this history, OSIT embarked on a comprehensive and statewide listening and community engagement tour in preparation for the writing of this Five-Year Action Plan. The State's broadband vision above and the goals and objectives below were derived from hundreds of community and stakeholder meetings in every county, an examination of best practices, a thorough review of the state's challenges, barriers, opportunities, assets and values, and an alignment with the purposes put forward by Congress and being implemented by NTIA. The goals and objectives below are a refinement and an update to goals and objectives the State set in its last broadband plan that was written during the height of the pandemic. These objectives will not only advance Nevada's connectivity goals but also contribute to the advancement of other State priorities in education, workforce development and advancement, economic development, healthcare and healthy living, public safety, environmental protection, and civic engagement. OSIT is committed to continued and ongoing community and stakeholder engagement over the next five years and beyond for refinements to our efforts and course corrections.

Goal 1: Universal Access to Modern Broadband Infrastructure

Objective 1: Bring modern, scalable broadband infrastructure to communities that lack it.

Objective 2: By 2029, deploy modern, scalable broadband infrastructure to unserved and underserved residential and business locations within communities so that all Nevadans have access to affordable, reliable and scalable high-speed internet access with minimum speeds of 100/20 Mbps scaling beyond 100/100 Mbps.

Goal 2: Universal Access to Digital Equity

Objective 1: Develop and execute a multi-pronged low-income and middle-class affordability and access strategy that leads to increased adoption and residential broadband subscription rates.

Objective 2: Develop a plan to increase access to affordable connected devices and appropriate tech support with a particular focus on the needs of covered populations that is ready for execution before network construction is complete.

Objective 3: Develop and provide opportunities for all Nevadans to attain the skills, support, and security awareness to use reliable, high-speed broadband service and connected devices for robust participation in our society, democracy, and economy.

3. Current State of Broadband and Digital Inclusion

3.1 Existing Programs

Since its creation in 2015, OSIT has made significant progress expanding broadband infrastructure throughout the state and increasing rates of adoption and access to high-speed internet by leveraging various federal and state programs and funding sources. The following tables outline current programs along with the staffing and funding that support these programs.

Table 1: Current Activities that the Broadband Program/Office Conducts

ACTIVITY NAME	DESCRIPTION	INTENDED OUTCOME(S)
Whole Community Connectivity Program	Planning	Community engagement in needs assessment, asset inventory, stakeholder education and organization, and strategic planning.
E-rate Consultation and Fiber Deployment	Deployment	Connecting schools and libraries to fiber.
Rural Healthcare Program Consultation and Deployment	Deployment	Connecting rural health clinics to fiber.
ReConnect Technical Assistance	Deployment	Support and technical assistance to local communities or providers applying for ReConnect funds from USDA.
High Speed NV Phase I- Fiber Deployment Grants	Deployment	Community Anchor Institutions and State and local government facilities are connected to fiber.
Nevada Middle Mile	Deployment	Scalable, affordable upstream bandwidth in unserved and underserved regions of the state.
ACP Outreach and Enrollment	Adoption, Affordability	Increased enrollment rates in ACP.
ACP Train the Trainer	Adoption, Affordability	Increased enrollment rates in ACP.
OSIT Mapping Portal	Deployment, Adoption	Greater public understanding of the state of broadband in Nevada
Tribal Broadband Connectivity Program Technical Assistance	Deployment, Adoption	All Tribes in Nevada have access to affordable, reliable, scalable high-speed internet

ACTIVITY NAME	DESCRIPTION	INTENDED OUTCOME(S)
USDA DLT Technical Assistance	Deployment, Adoption	Improved rural health outcomes through greater use of telehealth.
Broadband Community Outreach	Deployment, Adoption, Affordability	Engaged communities, better understanding of needs and opportunities, long-term accountability.
Preparation for Digital Equity Capacity Grant Program	Adoption, Affordability, Device Access, Digital Literacy	Closing the digital divide and ensuring all Nevadans have the tools and knowledge to connect to the internet.
Preparation for Last-Mile Deployment Grants	Deployment	Using BEAD funds to bring connectivity to unserved and underserved areas.

Table 2: Current and Planned Full-Time and Part-Time Employees

CURRENT/ PLANNED	FULL-TIME/ PART-TIME	POSITION	DESCRIPTION OF ROLE
Current	FT	OSIT Director	Strategy, Planning, Oversight, Execution
Current	PT	Executive Assistant	Administrative Support
Current	PT	Deputy Attorney General	Legal Support

Table 3: Current and Planned Contractor Support

CURRENT/ PLANNED	FULL-TIME/ PART-TIME	POSITION	DESCRIPTION OF ROLE
Current	FT	Deputy Director	Strategy, Planning, Oversight, Execution
Current	FT	Director of Fiber Networks	Project Management and Oversight
Current	FT	Construction Project Manager	Statewide Construction Project Management and Execution
Current	FT	Construction Project Manager	Construction Oversight and Liaison
Current	FT	Construction Project Manager	Construction Oversight and Liaison
Current	FT	Digital Equity Program Manager	Digital Equity Planning and Project Execution

CURRENT/ PLANNED	FULL-TIME/ PART-TIME	POSITION	DESCRIPTION OF ROLE
Current	FT	GIS and Data Visualization Specialist	Mapping and GIS
Current	FT	Fiscal and Operations Manager	Reporting, Fiscal Management, Contractor Support, Grants Management
Current	PT	Digital Equity	Research and Plan Writing Support
Current	PT	Technical Reviewers	RFP Evaluation Support
Current	PT	Data Modeling	Assist in mapping, defining project areas, and projecting costs
Current	PT	Federal Consulting	Engineering, Strategy, and Program Design
Current	PT	Outreach and PR Consulting	Website, Graphic Design, Copy PR
Current	PT	Advisory Services	Assist in Digital Equity Plan Writing and Research
Current	PT	Federal Consulting	Federal Funds Strategy
Current	PT	Grants Management	Audit Support for Subgrants
Current	FT	Digital Navigator	ACP Awareness, Outreach and Enrollment
Planned	FT	Digital Navigator	ACP Awareness, Outreach and Enrollment
Planned	FT	Digital Equity Program Assistant	Research, Outreach, and Program Support

Table 4: Broadband Funding

SOURCE	PURPOSE	TOTAL
ARPA State Fiscal Recovery Fund	Deployment	\$203,586,110.00
Capital Projects Fund	Deployment	\$135,603,020.00
NTIA Middle Mile	Deployment	\$43,547,459.38
E-rate	Deployment	\$60,962,283.26
Tribal Broadband Connectivity Program	Deployment	\$33,461,480.00
BEAD	Deployment	\$416,666,229.74
Digital Equity Capacity Grant	Adoption, Digital Literacy, Device Access	TBD
State Funding	Deployment, Workforce Development	\$57,547,459.38
Broadband Infrastructure Program	Deployment	\$7,350,000
ReConnect	Deployment	\$29,454,596
Connecting Minority Communities	Adoption, Digital Literacy	\$2,488,048
RDOF	Deployment	\$8,168,887.80
Rural Healthcare Program	Deployment	\$11,428,638.65
FCC ACP Outreach and Enrollment	Adoption, Affordability	\$450,000

3.2 Partnerships

Universal access will require strong partnerships and alignment around shared objectives. Cooperation among State agencies and between the State, local governments, telecommunications providers, philanthropy, and economic development, business, healthcare, public safety, and community stakeholders will be essential. Starting in 2015, stakeholder engagement and partner development have been core OSIT activities. These partnerships will continue to be valuable to OSIT as we advance toward our universal access goals. Building on relationships developed in the five years prior to the passage of the IJJA, OSIT embarked on a comprehensive, statewide outreach and engagement tour, visiting every county in the state multiple times to better understand the broadband ecosystems and needs in each county. For the purposes of this Five-Year Action Plan, the table below represents partners that OSIT may cooperate with during the implementation of its BEAD and Digital Equity initiatives rather than a comprehensive list of all stakeholders that support internet for all. OSIT will continue to expand this list throughout the duration of this effort.

Table 5: Partners

PARTNERS	DESCRIPTION OF CURRENT OR PLANNED ROLE IN BROADBAND DEPLOYMENT AND ADOPTION
Carson City	Local coordination and long-term accountability.
Children's Cabinet	Adoption, access, and awareness.
Churchill County	Local coordination and long-term accountability.
City of Henderson	Local coordination and long-term accountability.
City of Las Vegas	Local coordination and long-term accountability.
City of North Las Vegas	Local coordination and long-term accountability.
City of Reno	Local coordination and long-term accountability.
Clark County	Local coordination and long-term accountability.
Communication Workers of Nevada	Workforce development.
Contractors	Deployment and workforce partners.
Douglas County	Local coordination and long-term accountability.
Economic Development Authority of Western Nevada	Business and industry engagement.
Education SuperHighway	ACP awareness and enrollment.
Elko County	Local coordination and long-term accountability.



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PARTNERS	DESCRIPTION OF CURRENT OR PLANNED ROLE IN BROADBAND DEPLOYMENT AND ADOPTION
Enterprise IT Services	Coordination with State network.
Esmeralda County	Local coordination and long-term accountability.
Eureka County	Local coordination and long-term accountability.
Frontier Coalition	Adoption, access, and awareness.
Goodwill of Southern Nevada	Affordability, access, connected devices, and digital equity partner.
Governor's Office of Economic Development	Business and industry engagement.
Governor's Office of New Americans	Affordability, access, and connected devices for recent immigrants, low-income Nevadans, and Nevadans whose first language is not English.
Healthy Communities Coalition	Adoption, access, and awareness.
Humboldt County	Local coordination and long-term accountability.
Inter-Tribal Council of Nevada	Tribal engagement, TBCP deployment, adoption, and digital equity partner.
Internet Service Providers	Deployment and digital equity partners.
Lander County	Local coordination and long-term accountability.
Las Vegas Clark County Library System	Adoption, access, digital skills, and workforce development.

PARTNERS	DESCRIPTION OF CURRENT OR PLANNED ROLE IN BROADBAND DEPLOYMENT AND ADOPTION
Las Vegas Global Economic Alliance	Business and industry engagement.
Las Vegas Urban League	Affordability, access, connected devices, and digital equity partner.
Lincoln County	Local coordination and long-term accountability.
Lyon County	Local coordination and long-term accountability.
Mineral County	Local coordination and long-term accountability.
NDIA	Data, research, and best practices.
Nevada Association of Counties	Local coordination and long-term accountability.
Nevada Department of Education	Affordability, access, and connected devices for students.
Nevada Department of Employment, Training, and Rehabilitation	Affordability and access, access, workforce development.
Nevada Department of Health and Human Services	Affordability and access, access, workforce development.
Nevada Department of Transportation	Infrastructure permitting and deployment partner.

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PARTNERS	DESCRIPTION OF CURRENT OR PLANNED ROLE IN BROADBAND DEPLOYMENT AND ADOPTION
Nevada Indian Commission	Tribal coordination.
Nevada League of Cities	Local coordination and long-term accountability.
Nevada Regional Development Authorities	Business engagement.
Nevada Rural Housing Authority	Deployment partner in low-income housing, access, awareness and enrollment in ACP.
Nevada State Library and Archives	E-rate support, Library outreach and coordination, access, connected devices, and digital literacy.
Nevada System of Higher Education	Workforce development.
Nevada Telecommunications Association	Internet service provider engagement.
NevadaWorks	Workforce development.
Northern Nevada Development Authority	Business and industry engagement.
Nye County	Local coordination and long-term accountability.
Outlook Foundation	Device Access.
Pershing County	Local coordination and long-term accountability.
PEW	Data, research, and best practice.

PARTNERS	DESCRIPTION OF CURRENT OR PLANNED ROLE IN BROADBAND DEPLOYMENT AND ADOPTION
Reno Housing Authority	Deployment partner in low-income housing, access, awareness and enrollment in ACP.
Rural county libraries	Adoption, access, digital skills, and workforce development.
Southern Nevada Housing Authority	Deployment partner in low-income housing, access, awareness and enrollment in ACP.
Storey County	Local coordination and long-term accountability.
United Way of Northern Nevada	Affordability, access, connected devices, and digital equity partner.
United Way of Southern Nevada	Affordability, access, connected devices, and digital equity partner.
Washoe County	Local coordination and long-term accountability.
Washoe County Library System	Adoption, access, digital skills, and workforce development.
Western Nevada Development District	Business and industry engagement.
White Pine County	Local coordination and long-term accountability.
Workforce Connections	Workforce development.

3.3 Asset Inventory

Over the last six years, through its work with Broadband Action Teams established under its Whole Community Connectivity Program, OSIT has worked to understand and assess the communities' assets that could be leveraged to narrow the digital divide, as well as any available State assets that could be marshaled to meet community needs. Many of those assets are listed in the tables below. OSIT has concluded that sustainability presents a significant challenge to both State and community assets. For example, prior to the pandemic, the Douglas County Senior Center partnered with Douglas County High School students to enlist students to help to seniors understand how to use computers and smartphones. The program withered during the pandemic and has not since been restarted. As OSIT continues its community engagement, we expect to continue to add assets to this list.

Assets listed below are organized according to the priorities OSIT identifies in Section 5.2: Broadband Infrastructure Deployment, Adoption, Affordability, Access, and Digital Equity.¹

3.3.1 Broadband Infrastructure Deployment Assets

The State's primary broadband deployment assets are listed below. Both hard assets (defined as physical assets like conduit or towers) and soft assets (such as programs, activities, strategies, technical assistance, funding, and relationships) are included in the list below.

¹ Digital Equity-related assets such as those relating to adoption, affordability, access, and digital literacy are given a more thorough treatment in Nevada's Statewide Digital Equity Strategy.

² Discussed more in Section 5. In-demand job titles include but are not limited to: laborers, equipment operators and skilled laborers, fiber splicers and technicians, foremen, and installers.

Table 3.3.1

ASSET	ASSET OWNER	ASSET DESCRIPTION
Rights-of-Way	NDOT	86% of Nevada is federal land. NDOT rights-of-way are one of the most important tools the State has to grow its fiber infrastructure.
SB 53	NDOT	SB 53 is Nevada's joint trenching and dig once statute.
NDOT Infrastructure Sharing Program	NDOT	NDOT has a fiber trading program with providers and leverages open trenches due to road work to add to the State's fiber asset inventory. NDOT maintains this inventory in a GIS database.
Utility Poles	Electric Cooperatives	Cooperatives operate in some of the most rural and remote parts of Nevada. Like NDOT highway rights-of-way, utility poles and utility corridors enable fiber infrastructure across environmentally sensitive land.
Utility Poles	NV Energy	Like cooperatives, NV Energy's pole attachment program is an asset for both middle mile and last-mile fiber deployment.
Research and Education Network	NevadaNet, NSHE	Nevada's System of Higher Education (NSHE) maintains NevadaNet, Nevada's Research and Education Network which connects higher education institutions, K-12 schools, and other CAIs to Internet2.
Mapping and Data Analysis	OSIT	OSIT maintains public mapping resources that depict broadband infrastructure.
Existing State-Owned Conduit	State	NDOT and Nevada's Enterprise IT Services maintain fiber assets to State facilities.
Workforce System Funding	Various	Nevada's Community College system and its two WIOA-funded workforce boards, NevadaWorks and Workforce Connections are key partners in OSIT's broadband workforce development plan. The State received a Good Jobs Challenge grant OSIT will seek to leverage to boost training opportunities. OSIT also manages other workforce funding streams it will leverage to grow a highly-skilled broadband workforce that reflects Nevada's diversity. ²
Deployment Funds	OSIT	OSIT has received broadband deployment funding detailed in Section 3.1 that will be used to achieve the State's broadband goals and objectives.

3.3.2 Broadband Adoption Assets

Driving increased broadband adoption requires thinking about problems the internet can solve, such as work, accessing healthcare from a distant provider, job search, entertainment, or keeping in touch with family and friends. Adoption of home broadband service (or a commercial service in the case of a community anchor institution) thus requires an understanding of why the internet is beneficial, a connected device, and digital skills to use the internet. Fortunately, many organizations exist throughout Nevada that can support and promote adoption efforts. Nevada libraries are particularly important assets in underserved communities, in that they have continued to offer device loan programs started during the pandemic that enable newly connected households begin to use the internet at home. Libraries also provide adoption support with both digital literacy³ classes and on-demand technical support, discussed in greater detail in 3.3.4 and 3.3.5 below.

Table 3.3.2

ASSET	ASSET OWNER	ASSET DESCRIPTION
Digital Equity Partners	OSIT	Through its statewide digital equity planning process, OSIT has compiled a list of organizations that are currently engaged in some form of broadband adoption activity or are interested in becoming engaged.
Library computer and hotspot loan programs	County Libraries	During the pandemic, rural and urban libraries in Nevada offered both computer and hotspot loan programs. Much of the funding came from ESSR.
Device Access Programs	Various Non-Profits	Through its statewide digital equity planning process, OSIT became aware of several non-profits that offer device refurbishing services targeted at low-income individuals, veterans, and college students.
One-to-one student device programs	K-12 school districts	Prior to the pandemic, many K-12 school districts had achieved or were moving towards one-to-one device programs for students. During the pandemic, Nevada school districts that had not yet achieved 1:1 used Elementary and Secondary School Emergency Relief (ESSER), Emergency Connectivity Fund (ECF), and other funds to purchase devices for students to take home. OSIT learned from conversations with school districts and family advocacy organizations that parents and other family members used these devices after school to look for jobs, access benefits, and enroll in workforce development programs.

³ The term “digital equity” means the condition in which individuals and communities have the information technology capacity that is needed for full participation in the society and economy of the United States.

3.3.3 Broadband Affordability Assets

OSIT has been actively promoting affordability resources. The most common affordability program for devices and internet access in Nevada is the Affordable Connectivity Program (ACP).

The ACP is a Federal Communications Commission (FCC) program that helps connect families and households struggling to afford internet service. Funded by the Infrastructure Investment and Jobs Act (IIJA), the ACP is a \$14.2 billion federal broadband benefit that provides eligible households with a monthly discount of up to \$30 per month (up to \$75 per month for households on qualifying Tribal lands) and a one-time \$100 discount toward a laptop, desktop computer, or tablet.

ACP is open to households with an income of 200% or less of the Federal Poverty Guidelines and to households that have a member who accesses programs such as Supplemental Nutrition Assistance Program (SNAP), Medicaid, Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), Supplemental Security Income (SSI), Federal Public Housing Assistance (FPHA), Federal Public Housing Assistance (FPHA), Veterans Pension and Survivors Benefit, Free and Reduced-Price School Lunch Program or School Breakfast Program, and Federal Pell Grant.

In Nevada, as of August 2023, 46% of eligible 493,948 households are enrolled in the ACP program. The national average, according to EducationSuperHighway, is 35%.

Table 3.3.3

ASSET	ASSET OWNER	ASSET DESCRIPTION
ACP	FCC	Described above, ACP is an essential part of Nevada's affordability strategy and efforts.
ACP Awareness and Enrollment	OSIT	OSIT has worked with community partners and State and local government agencies to make clients aware of the ACP.
ISP ACP Discounts	ISPs	Some Internet Service Providers (ISPs) in Nevada offer ACP-eligible low-income plans at \$30/month. When combined with ACP, households have no out-of-pocket costs for their monthly internet subscription.
FCC ACP Grant	OSIT	OSIT received an FCC ACP Outreach and Enrollment grant. OSIT identified the 62 lowest enrollment zip codes in the State and will be conducting outreach, awareness, and enrollment events with local partners.
FCC ACP Grant	Clark County	Clark County received an FCC ACP grant and will be leveraging the County workforce to increase awareness and enrollment.
FCC ACP Grant	Nevada Public Health Institute	Will focus on working with partners to effectively perform outreach, perform local outreach events, and provide health equity guidance.
Middle Mile	OSIT	Nevada has limited middle mile infrastructure. Lack of affordable upstream bandwidth contributes to limited, unaffordable, slow-speed internet options. New middle mile infrastructure will reduce costs for last-mile internet service providers and make retail internet service more affordable for everyone.

3.3.4 Broadband Access Assets

Nevada’s Public Library System champions digital equity across regions. In the north, Washoe County Library System offers digital resources, 24/7 Wi-Fi, computers, and classes. The south’s Las Vegas-Clark County Library District provides in-library tech, device checkouts, Teen Tech Labs, and classes. In rural Humboldt Library, hotspots, computers, iPads, and the “Office in a Box” program connect users to vital services. These libraries unite communities, bridging the digital divide statewide.

Table 3.3.4

ASSET	ASSET OWNER	ASSET DESCRIPTION
Public Wi-Fi	CAIs	Many Community Anchor Institutions (CAIs) in Nevada, including most libraries, Tribal libraries, community centers, government facilities, and senior centers offer free public WiFi.
Tribal WiFi	Tribes	OSIT has assisted 12 of Nevada’s Tribal Nations apply for funding to construct fiber to Tribal libraries. These libraries are often the first high-speed connections on the reservation and offer computer labs or public WiFi if Tribal members bring their own device.
eduroam	NSHE	eduroam is a secure wireless network that allows you to access the internet at tens of thousands of locations around the world, including most NSHE institutions, without having to register and reconfigure your device when you travel. NSHE maintains a list of places one can connect to eduroam in Nevada and around the world.
Middle Mile	OSIT	Nevada has limited middle mile infrastructure. New middle mile infrastructure built through the High Speed Nevada initiative will significantly increase access to affordable, reliable, scalable high-speed internet in unserved and underserved communities.

3.3.5 Digital Literacy Assets

In partnership with Purdue University, OSIT created and mapped the [Nevada Digital Divide Index](#). Using a wide variety of data sources, the DDI assesses at the census tract level infrastructure, access, adoption, socioeconomic, and other factors that how likely a geographic area is to be affected by the digital divide. This map does not provide answers to bridging the digital divide; rather, it helps community leaders and stakeholders ask better questions and have deeper, more meaningful conversations. The darker the purple on the map, the higher the likelihood of impact from the digital divide. The DDI is one of many Digital Equity maps and data visualizations in the [OSIT Broadband Mapping Portal](#).

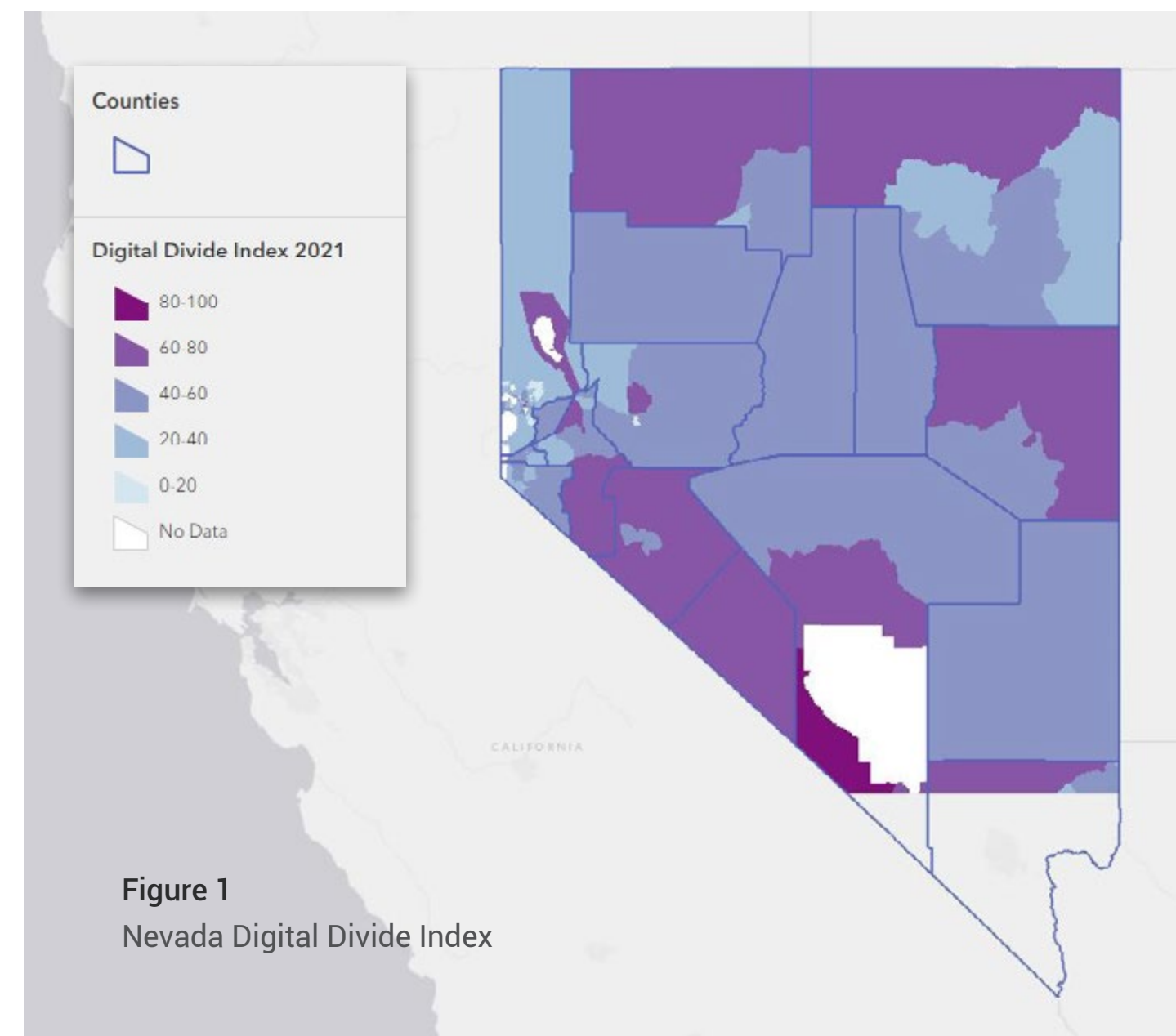


Table 3.3.5

ASSET	ASSET OWNER	ASSET DESCRIPTION
Digital Equity Partners	OSIT	Through its statewide digital equity planning process, OSIT has compiled a list of organizations that are currently engaged in some form of broadband adoption activity or are interested in becoming engaged.
Research	OSIT	Research and relationships created during the preparation of OSIT's Statewide Digital Equity Plan.
Digital Literacy	Various	Many libraries, education institutions, senior centers, and other CAIs offer or are able to offer free digital literacy classes to the public.
Technical Support	Various	Many libraries and other CAIs offer free, on-demand technical support to community members.
Maps and Data Visualizations	OSIT	OSIT has created a number of maps that help visualize equity data and help community members have better conversations about needs, assets, and solutions.

3.4 Needs and Gaps Assessment

Nevada ranks as the 34th most connected state in the US⁴ by some metrics. Needs and gaps regarding broadband service, however, differ based on location and by population. The following sections examine Nevada’s needs and gaps in more depth with respect to broadband infrastructure deployment, adoption, affordability, access, and digital equity.⁵

Table 3.4.1 Broadband Infrastructure Deployment Needs and Gaps

NEED	GAP
Unserved Locations	51,689 broadband serviceable locations
Underserved Locations	8,985 broadband serviceable locations
Unserved Tribal Locations	2,523 broadband serviceable locations
Underserved Tribal Locations	246 broadband serviceable locations
Underserved Multi-Dwelling Units	40,187 units
Middle Mile	941 miles
Unserved and Underserved CAIs	604 community anchor institutions without gigabit symmetrical service.
Workforce and Workforce Development	Skilled laborers, technicians, foremen, and equipment operators and industry-approved pipeline that delivers a highly-skilled workforce.
Materials, Supplies, Outside Plan, and Equipment	Resilient supply chain that meets Buy American requirements.
Efficient Permitting Processes	Sufficient permitting capacity at federal land-owning and state and local permitting agencies to process permit applications and environmental reviews effectively and efficiently.

⁴ <https://broadbandnow.com/Nevada>

⁵ Digital Equity-related assets such as those relating to adoption, affordability, access, and digital literacy are given a more thorough treatment in Nevada’s Statewide Digital Equity Strategy.

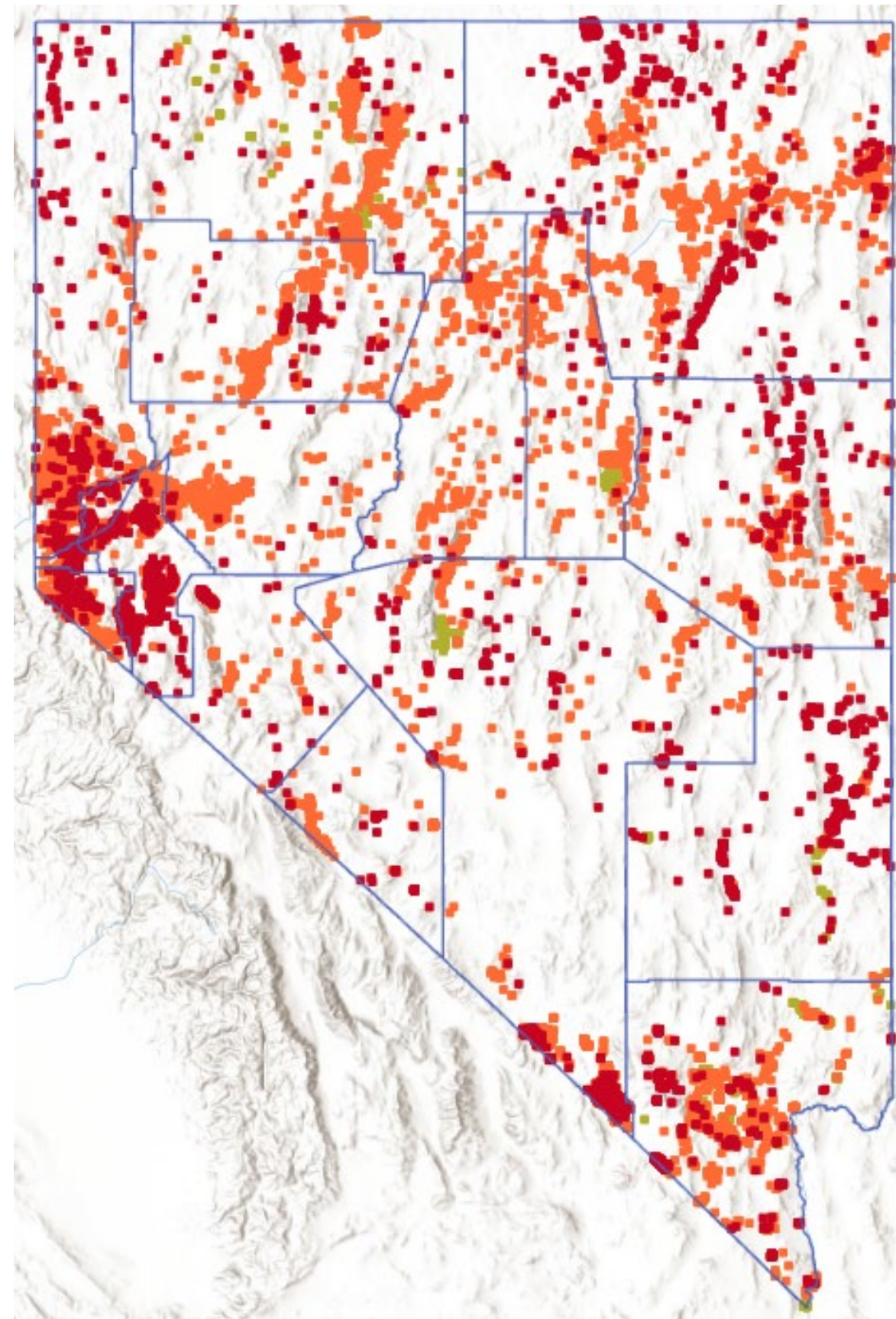


Figure 2
Unserved and Underserved Broadband Serviceable
Locations in Nevada

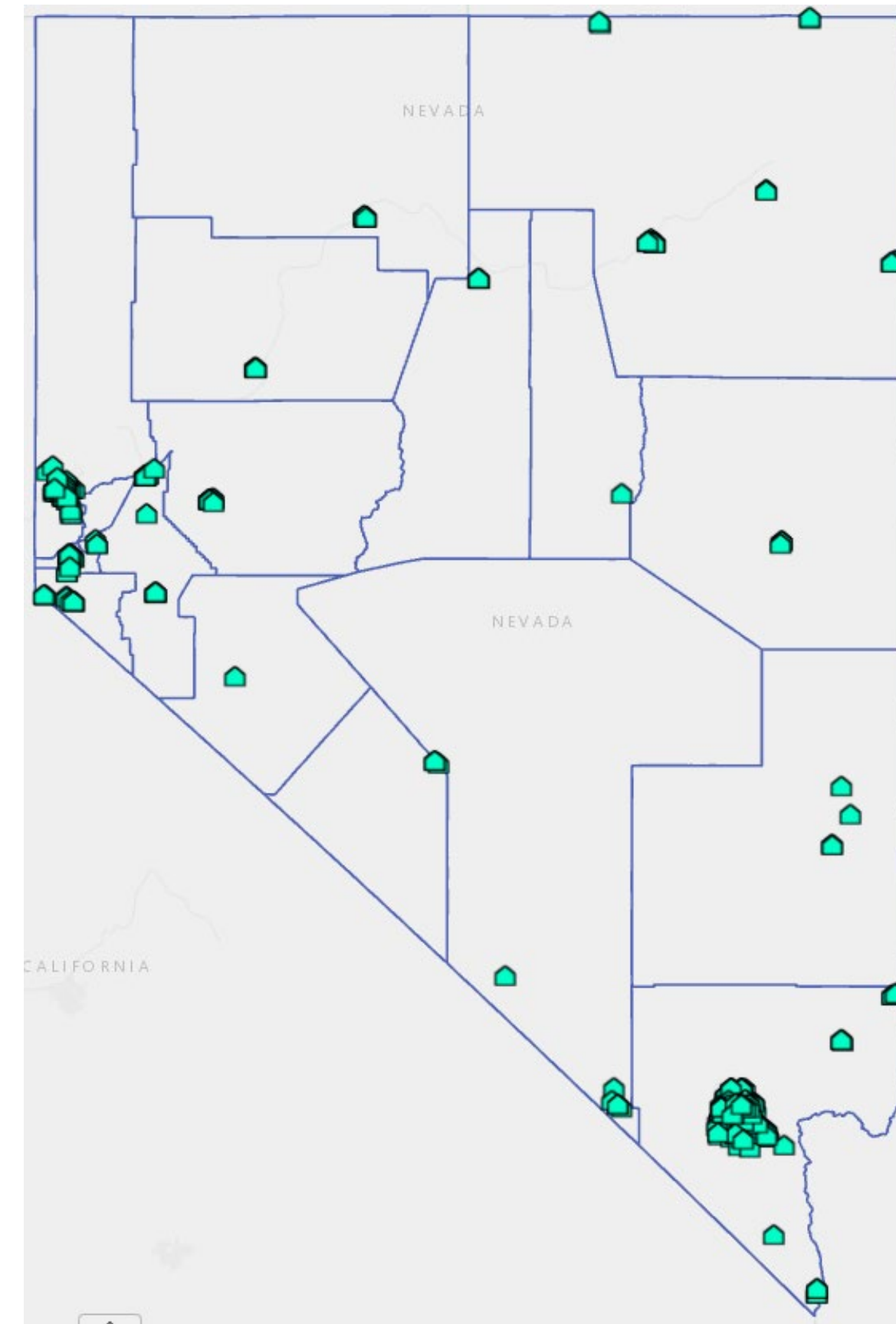


Figure 3
Underserved Multi-Dwelling Units

3.4.2 Broadband Adoption Needs and Gaps

According to the 2021 American Community Survey (ACS), 87.3% of Nevadans report subscribing to a broadband internet subscription. However, 93.8% of locations in Nevada have access to broadband. This discrepancy points to reasons other than lack of infrastructure for why some Nevadans have not subscribed. During OSIT's outreach and engagement tour, OSIT learned that many Nevadans do not subscribe because the cost is too high, they do not have a computer or other connected device, the internet service in their community is unreliable, they are satisfied with their mobile-only internet connection and subscribing to both cellular service and internet service is too costly, they are concerned about cybersecurity, or they do not see the benefits of a home internet subscription.

Table 3.4.2

NEED	GAP
Higher residential broadband service subscription rate	87.3% of Nevadans have subscribed to a home broadband service. Subscription rates are lower among covered populations.
Higher broadband subscription rates at CAIs	Some community anchor institutions, mostly in rural areas, do not subscribe to internet service and do not have sufficiently available connected devices, such as computers, for patrons to use.
Increased adoption of telemedicine, digital learning and workforce development, and online availability of government services	Underserved communities have lower access to access to healthcare, education, workforce development, and government services.

3.4.3 Broadband Affordability Needs and Gaps

Affordability is cited as the number one reason why households do not currently subscribe to a home internet service. The Affordable Connectivity Program (ACP) is the largest and most important tool the State has to meet affordability needs. 229,082 of the 493,948 eligible Nevada households are enrolled in ACP, which equates to a 46% enrollment rate. ACP provides \$6.8 million in support to Nevada households monthly. While that enrollment rate is higher than the national average, fewer than half of eligible Nevadans participate. Lack of awareness remains the biggest challenge, followed by needs for enrollment assistance.⁶ Even among households that self-identified as low-income, many assumed they would not qualify and had decided not to apply.

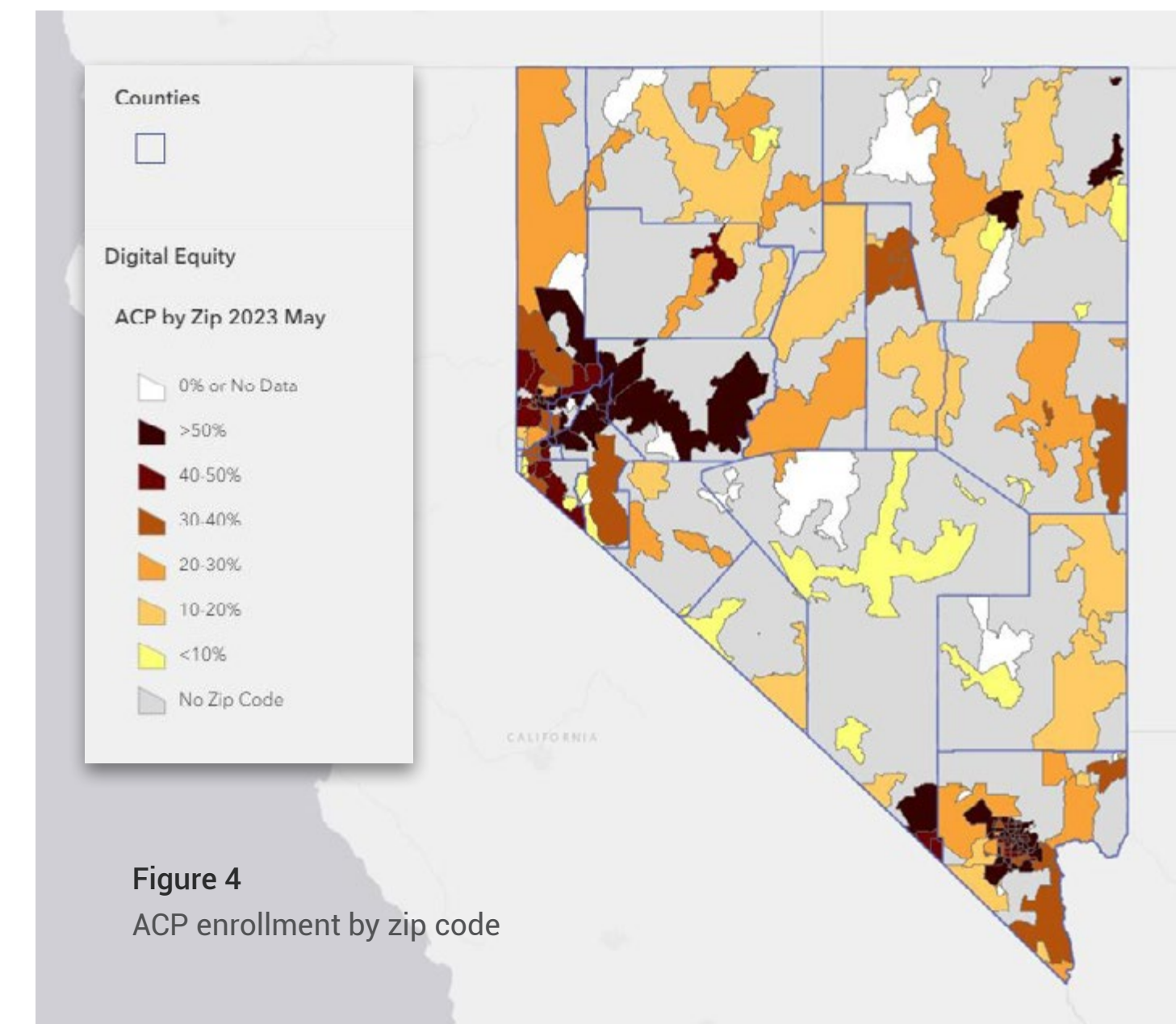
Providers reported that lack of available affordable upstream bandwidth was the most significant factor contributing to a lack of interest in serving unserved markets or the lack of affordable service in markets they served.

The map to the right depicts ACP enrollment by zip code. The darker the color indicates the higher the enrollment rate in ACP. This map also serves to illustrate the vast distances between population centers and the open spaces that make Nevada beautiful.

⁶ In surveys and public engagement meetings, a large number of Nevadans that identified as low-income and aware of the program reported not being able to complete the enrollment process, either because they were told they were not eligible, applied but never received a response, or that the application process was too difficult or took too long.

Table 3.4.3

NEED	GAP
Higher ACP enrollment rate	Enrollment in ACP is not uniform geographically across the state. Enrollment in the lowest 62 zip codes is less than half the statewide average.
Increased ACP awareness	
ACP enrollment assistance	
Affordable upstream bandwidth for last-mile ISPs	Rural areas have fewer affordable upstream bandwidth options than urban areas.
Increased options for broadband services, including a wider range of low-cost services.	Modern, reliable, scalable infrastructure does not exist in every community in Nevada.



3.4.4 Broadband Access Needs and Gaps

The ACS data indicate that 94.7% of households in Nevada have a computer, defined as a desktop, laptop, smartphone, tablet or other portable wireless computer. One limitation in the ACS data is that it includes smartphone access in the total number of those with access to a computer. As was demonstrated during the pandemic, it is very difficult to write a term paper for school, apply for a job, participate in workforce training, or submit eligibility paperwork for public benefits on a smartphone. Device access beyond a smartphone is a larger problem for members of covered populations. Census data indicate that the number is closer to 39% of individuals from covered populations do not use a computer or tablet. Anecdotes gleaned from community listening sessions substantiated the data indicating that device access is a greater concern amongst members of covered populations.

During OSIT's community outreach, many Nevadans who are members of a covered population expressed that they unable to afford or acquire a quality connected device. Compounding this problem, many internet service providers in Nevada that participate in ACP for monthly service fees do not participate in the ACP device discount program. While reasons vary, many providers cite the administrative requirements of tracking device recipients and ensuring one benefit per eligible enrollee as one reason.

Table 3.4.4

NEED	GAP
Fiber infrastructure	Lack of infrastructure reduces broadband access in three ways: cost, quality and reliability, and available subscription options
Increased availability of connected devices	Covered populations use computers at a much lower rate than the general population.
Increased availability and awareness of public WiFi options	Free public WiFi exists in many communities but is not well advertised.

3.4.5 Digital Literacy Needs and Gaps

Access to a working connected device and reliable broadband service is not always sufficient for ensuring that individuals and households can use the internet for school, work, or personal reasons. The attainment of foundational digital skills such as internet basics and email significantly increase the likelihood that an individual will use the internet for educational and career purposes.

Estimates indicate that up to 16% of adults are not sufficiently comfortable or competent enough with technology to use a computer device. Additionally, the National Skills Coalition finds that nearly one-third of workers have limited or no digital skills. Adults who lack digital literacy are, on average, less educated, older, and more likely to be members of minority groups, or foreign-born. Furthermore, adults who are not digitally literate show a lower rate of labor force participation and work in lower skilled jobs.

Table 3.4.5

NEED	GAP
Increased digital skills and digital literacy	A greater share of aging individuals, individuals with disabilities, and individuals in low-income households experienced challenges with basic to advanced digital skills, especially skills involving cybersecurity and online privacy.
Increased availability of on-demand tech support	Compared to the general population, certain covered populations had decreased access to technical support. Nearly 1 in 3 aging individuals, individuals with disabilities, and low-income individuals did not have access to technical support in their communities.

The Impact of COVID-19

The COVID-19 pandemic further exposed Nevada’s (NV) lack of broadband service availability particularly in rural, tribal lands and frontier parts of the State. This lack of access creates divides in access to education, access to healthcare, economic vitality for individuals and economic development opportunities for large parts of rural NV. A couple of statistics display the increased reliance on broadband service as a result of the COVID-19 pandemic.

The average daily in-home data usage in the United States increased significantly during the coronavirus (COVID-19) outbreak in March 2020. Compared to the same time in March 2019, the daily average in-home data usage increased by 38 percent to 16.6 gigabytes, up from 12 gigabytes in March 2019. The increase can be observed across almost all device categories with the data usage of gaming consoles and smartphones increasing the most.⁷

Virtual Private Network (VPN) (dedicated, secure connectivity paths from one site to another) usage in the United States surged during the coronavirus crisis, increasing 124 percent during the two weeks between March 8 and March 22, 2020. The United States reported an increase of over 33,000 confirmed COVID-19 cases during these first two weeks in March 2020. Increased [VPN usage can have many reasons](#), the most popular ones being access to other digital media content and social networks, and most importantly, access to different news sources. As some countries restrict access to many news and media outlets, users frequently use VPN to stay up to date with crucial developments.⁸ Education application usage increased by 124% year over year in this period.

⁷ <https://www.statista.com/statistics/1106863/covid-19-daily-in-home-data-usage-change-us-2020/>

⁸ <https://www.statista.com/statistics/1106137/vpn-usage-coronavirus/>

4. Obstacles or Barriers

Nevada faces a number of different challenges in providing universal access to broadband services.

Geography:

Nevada is a geographically large state with 90 percent of its population living in its urban areas.⁹ Nevada's rural cities and towns are isolated, surrounded by rugged, mountainous, and arid terrain. Even though it consistently ranks as one of the five fastest growing states, Nevada ranks in the bottom 10 states in terms of population density.¹⁰ The combination of distance, difficult terrain, and low population density make private investment in broadband infrastructure expensive and often unattractive to private broadband service providers as there is often no path to a return on investment.

Distance: Communities in Nevada are isolated; on average, distances between cities on Nevada's major rural corridors is greater than 50 miles.

Terrain: Due to Nevada's terrain, the cost per mile of fiber installation is in the range of \$22-\$37 per foot for buried fiber compared to the national average of \$15-\$20 per foot of buried fiber.¹¹

Density: fewer potential subscribers makes it difficult to attract new providers to a community or to entice an incumbent to upgrade its infrastructure without significant public investment.

Permitting: Nevada is 86% federal land, which realistically limits the availability of routes to build new fiber primarily to existing highway rights-of-way or easements on utility poles. The federal permitting process is lengthy and complex, often taking 12-18 months depending on the location and complexity of the route.

Redundancy and Resiliency:

During the last decade, connectivity has become an important factor in the State's economic development efforts to attract, retain, and expand companies. Connectivity is important to large, new and expanding data center companies like Switch, Google, and Apple; to healthcare providers expanding coverage through telemedicine; to legacy industries like gaming and mining; and to smaller employers seeking to compete in a global marketplace. One key to successfully connecting communities and businesses alike is diverse fiber paths along key middle mile routes. Expanding middle mile routes improves route diversity and redundancy so that a single fiber cut does not result in a broadband outage.

Fiber routes often follow rights-of-way along major freeways and highways in order to minimize environmental disturbance and costs. In Nevada, important fiber routes

⁹ https://med.unr.edu/Documents/med/statewide/reports/2017FINAL_DATABOOK_ADA_introduction.pdf

¹⁰ [https://www.states101.com/populations/nevada#:~:text=The%20population%20density%20in%20Nevada,\(48th%20out%20of%2056\)](https://www.states101.com/populations/nevada#:~:text=The%20population%20density%20in%20Nevada,(48th%20out%20of%2056))

¹¹ <https://ops.fhwa.dot.gov/publications/fhwahop09021/03cost.htm>



exist along I-80, I-15, US 50, US 95, and US 6. Two problems exist in many places in Nevada that contribute to a lack of redundancy and resiliency. First, key fiber routes are single pathed, meaning that a single fiber pathway serves large areas. Second, these pathways often lack interconnect facilities in rural areas. Interconnect facilities are like off-ramps that can facilitate last-mile connections into communities.

An example of the key corridor challenges in Nevada comes from the City of Elko. Recently service providers interested in deploying last mile fiber and wireless service in the City of Elko and the Spring Creek development had difficulty getting quotes for Internet Service on diverse pathways between Reno and Salt Lake City. If a last mile provider relies on only one upstream pathway to reach an Internet on-ramp in a major city, one fiber cut, or equipment interruption causes a complete service outage. Last mile providers strongly prefer multiple pathways of upstream service to enhance the resiliency of their last mile service. The challenges experienced in the I-80 corridor are similar to those of other corridors in the state.

Affordability:

It is important to note that access to broadband infrastructure does not equate access to broadband service or broadband

adoption as many households in Nevada do not subscribe to a home broadband service even when one is available for a variety of reasons including affordability and lack of digital literacy. According to the Pew Research Center, cost was the top reason cited for not subscribing to a home broadband service¹². Many individuals instead substitute their smartphone for their internet needs. Home broadband subscription rates are 10 percentage points or more lower for Blacks, Hispanics, those with a high school education or less, those earning less than \$30,000 per year, those over 65, and those living in rural areas¹³. Looking at broadband adoption for education, a recent US Census Bureau survey provides some insights into internet availability in households in Nevada with children during the pandemic¹⁴. Seventy-six percent of the 536,000 households surveyed in Nevada reported always having internet available with generally lower internet availability rates for households with lower levels of education, lower levels of income, and households aged 65 and above. These same households are also less likely to own a computer, tablet, or other connected device and are more likely to rely solely on a smartphone for internet access.

Digital Literacy:

In Nevada, senior citizens are 10 percent less likely to have home broadband service as those in the 18-64 age cohort, based on data from the 2018 American Community Survey (ACS)¹⁵. As with the general population, ACS data indicate that senior citizens with low incomes, low educational attainment, that live in rural areas, are Black, Latino, female, or single, or have a disability are more likely to not have a home broadband service. Low broadband adoption rates among seniors are both

caused by and contribute to digital illiteracy. Low broadband adoption rates contribute to increasing inequities and have implications for seniors in many areas, including lack of access to information, connection to family and community, access to healthcare, and access to government services.

Given these challenges, Nevada ranks as the 34th most connected state in the US¹⁶. Population growth and greater needs for connectivity for work, education, healthcare, commerce, and entertainment mean an ever-increasing need for broadband infrastructure. For rural cities in particular, access to reliable broadband service is increasingly critical to attracting and retaining residents and industries.

Workforce Shortages and Supply Chain Issues:

Both issues are well documented nationally and Nevada is no exception. Shortages of skilled workers, outside plant materials, and electronics drive up prices and lengthen timelines to completion.

Age of Existing Utility Poles:

OSIT has found that many utility poles are at end-of-life and are unable to accommodate telecommunications infrastructure. Replacing poles significantly increases the costs of projects, requires additional permits, and lengthens the timeline to completion.

¹² <https://www.pewresearch.org/internet/2019/06/13/mobile-technology-and-home-broadband-2019/>

¹³ Ibid.

¹⁴ <https://www.census.gov/data/tables/2021/demo/hhp/hhp22.html>

¹⁵ https://agingconnected.org/wp-content/uploads/2021/05/Aging-Connected_Exposing-the-Hidden-Connectivity-Crisis-for-Older-Adults.pdf

¹⁶ <https://broadbandnow.com/Nevada>



5. Implementation Plan

5.1 Stakeholder Engagement Process

OSIT is charged with the realization of the broadband vision put forward above.

Created in 2015, OSIT has a long history of interaction with communities in all corners of the state. Starting in 2017, OSIT created the Whole Community Connectivity program and created Broadband Action Teams (BATs) in every county of the state.

Building on this history and in preparation for the writing of this Five-Year Action Plan and the Statewide Digital Equity Strategy, OSIT embarked on a comprehensive and statewide community outreach and engagement tour. The purpose of the tour was twofold: first, to listen and learn more about the infrastructure and digital equity needs faced by Nevadans; and second, to offer information about the planning and forthcoming implementation processes.

During the eight months prior to the publication of this plan, OSIT conducted outreach and held public in-person and virtual meetings with stakeholders and members of the public in communities throughout the state. Attendees included community-based organizations, non-profits, internet service providers, labor, local governments, Tribal governments, leaders from Community Anchor Institutions (CAIs), and other stakeholders to understand connectivity needs and existing broadband infrastructure, including the capacity of existing infrastructure to scale to meet present and future needs. In total, OSIT visited every county in Nevada twice, traveled over 4,000 miles in April 2023 alone, held over 130 meetings with nearly 1,000 Nevadans. Additionally, OSIT distributed surveys in both online and paper formats and captured responses from nearly 800 additional Nevadans. OSIT also developed a detailed Request for Information targeted at internet service providers, labor, workforce and higher education, and other organizations and asked 61 questions regarding 5 topics related to BEAD. OSIT received 18 detailed responses that have contributed to the development of this plan.

During facilitated stakeholder meetings, feedback and responses to questions were anonymously compiled and inputted into a database and results were aggregated.

OSIT made dedicated efforts towards a diverse engagement approach. This approach included reaching out individually to covered populations and the organizations that serve them. It also included a diversity of outreach mediums:

- **In-person public meetings** in community centers, libraries, senior centers, and government facilities in the morning, afternoon and evening.
- **Online options** including multiple webinars targeted at specific stakeholders.
- **Surveys** distributed online and printed in multiple languages.

Nevada has 28 federally-recognized Tribes and OSIT also has a long history of working with its Tribal Nations. Nevada's Governor wrote a letter offering a formal government-to-government consultation. This letter was mailed physically and electronically to all Tribal Chairs and other points of contact, and OSIT staff followed up with additional outreach via email and phone. OSIT also distributed a paper survey to Tribal Nations.

In the engagement process, OSIT was assisted by the Nevada Indian Commission and the Inter-Tribal Council of Nevada. At the time of publication of this report, OSIT had contacted 21 Tribes. Next steps for Tribes are outlined below in 5.4. Efforts continue to connect with the remaining Tribal Nations.

OSIT, working in close partnership with Nevada's two workforce development boards, Workforce Connections and Nevadaworks, which are laser focused on developing innovative workforce development programs aligned with Nevada's high growth, high demand Industries. Recently, OSIT and Nevadaworks met individually with internet service providers, labor, and contractors to discuss and understand workforce needs and potential workforce development strategies as the telecommunications talent pipeline is developed in Nevada. OSIT also met with CAIs in every county, including libraries, community centers, senior

centers, Boys and Girls Clubs, health clinics, public housing, education, government, and community support organizations, regarding their needs for broadband infrastructure and digital equity. In addition to discussing needs, OSIT also learned about community needs, barriers, and assets and how these CAIs could play a role in realizing the State's broadband vision.

The many conversations the OSIT team had throughout Nevada informed the creation of the vision, goals and objectives, and the priorities, strategies, and activities detailed in 5.2-5.4. A short summary of the key themes learned during the process is described below.



Outreach and engagement in rural Nevada

5.1.1 Key Themes and Takeaways from Stakeholder Engagement

Infrastructure Deployment

- OSIT heard overwhelmingly that the State should define the success of the BEAD program as providing high-speed internet service to all unserved and underserved locations and that available infrastructure funding should be prioritized and utilized to connect as many locations as possible to high-speed, reliable, scalable infrastructure.
- The lack of high-speed and reliable internet service is a major barrier to residents and businesses alike in many communities. Residents in all parts of the state reported unreliable, inconsistent internet service that was unable to support multiple users. Some residents were forced to rely on hotspots or mobile data, which, due to data caps and throttling, made some high-bandwidth tasks difficult.
- There is a need for laborers, fiber splicers, foremen, workers who can operate heavy or specialized machinery, installation and field technicians, and workers who will show up on time and drug free. The State should create a workforce pipeline to help address these needs.

Adoption

- People rely on public libraries to connect to the internet, but some libraries do not have enough staff, computers or high-speed, reliable connectivity to address the need.
- Some communities and Community Anchor Institutions (CAIs) have no resources to help with technology issues.
- Lack of trust is an issue that affects adoption. Some residents and CAIs have been solicited or victimized by the Affordable Connectivity Program (ACP) or free device scams.

Affordability

- Many eligible Nevadans are either not aware of the ACP or do not believe they will qualify for it.
- The high cost of broadband internet service, which sometimes also requires a “bundled” subscription with phone or TV services, is a major barrier for many Nevada residents.
- The price of internet service keeps increasing while quality and reliability remains static.

Device Access

- The cost of devices makes it difficult for people to also afford the cost of internet service. Individuals from low-income households cannot afford internet service, a device, and a phone.
- Having access to a device does not mean that people have access to the internet.

- Many people, including older adults, have smartphones, but do not have computers. They rely on smartphones to perform tasks that would be more effectively or easily accomplished with a computer.
- In many households, multiple children must share a connected device to do homework.

Digital Literacy

- Many people lack the basic digital literacy skills needed to use technology effectively
- Residents experience difficulties finding quality technical support to help with devices, websites, or applications. Some communities have no programs, funding, or services to help with technology issues
- Many CAIs lack the staff to offer digital literacy classes or digital support. For example, some senior centers reported having computer labs but lack on-site technical support for residents.
- Many people are afraid of scams and do not know how to protect themselves online. Older adults would like more information to help protect themselves against online harms.

Moving forward, OSIT plans to continue regular engagement throughout Nevada, leveraging County Broadband Action Teams and other stakeholders, its newsletter distribution list, its website, and the local media. Through these means, OSIT can ensure that the public will continue to be informed about broadband deployment, availability and digital equity.



5.2 Priorities

Significant federal funding will be required to achieve Nevada’s broadband vision and ensure all Nevadans have access to high-speed internet that is affordable, reliable and scalable. Many activities will be required but federal funds are limited and not every required activity is best funded by federal dollars. Stakeholder feedback and an examination of federal and non-federal funding sources led to the following priorities for use of federal funding. These priorities represent principles the State will use in its allocation of federal dollars and that are aligned with the vision, goals, and objectives described above. The development of these priorities was done in close coordination with Nevada’s Statewide Digital Equity Plan.

The State has other priorities, including, but not limited to, the development of a highly-skilled broadband workforce that reflects Nevada’s diversity, leveraging the internet to expand access to education and workforce development, streamlining permitting processes at all levels of government, expanding access to telehealth, wildfire and other natural disaster detection, notification, and mitigation, climate and endangered species resilience, and public and traffic safety, mobility, and electric vehicle charging. These priorities will be pursued concurrently by other State, local, non-profit, and private organizations (with the support of OSIT) using other funding sources. Instead of spreading its limited resources too thin, OSIT will have a laser focus on the five priorities listed above. These principles will move Nevada closest and furthest towards its universal access vision.

Table 6: Priorities for Broadband Deployment and Digital Inclusion

PRIORITY	DESCRIPTION
Broadband Infrastructure Deployment	Deploy modern, scalable broadband infrastructure to unserved and underserved residential and business locations within communities so that all Nevadans have access to affordable, reliable and scalable high-speed internet access with minimum speeds of 100/20 Mbps scaling beyond 100/100 Mbps.
Adoption	Increase adoption rates among covered populations and the general population.
Affordability	Increase the number of people with access to an ACP-eligible plan. Increase the number of people aware of and enrolled in ACP. Reduce the cost of internet service for all Nevadans.
Device Access	Ensure that Nevadans have access to affordable, quality connected devices that can be used to access the internet for education, healthcare, workforce development, work, civic engagement, business, and keeping in touch with family and friends.
Digital Literacy	Provide Nevadans access to opportunities to increase their digital skills, including cybersecurity, and access to the tech support needed to use the internet and a connected device.

5.3 Key Execution Strategies

Goal #1:

Universal Access to Modern Broadband Infrastructure

Objective 1:

Bring Modern, Scalable Broadband Infrastructure to Communities that Lack It.

Strategies:

- Deploy resilient, redundant middle mile infrastructure throughout the state to set the table for last-mile deployments in unserved and underserved areas.
- Leverage and braid funding from many federal, State, local, and private funding sources to maximize impact and stretch dollars as far as possible.
- Offer non-discriminatory access to newly constructed fiber projects to support a provider's ability to penetrate into new areas, which will promote more affordable, reliable, scalable upstream bandwidth to last-mile providers to reduce costs and increase interest in unserved and underserved markets.
- Identify and deploy fiber to unserved and underserved Community Anchor Institutions and government facilities to serve as connectivity hubs in unserved and underserved communities.

- Facilitate partnerships between long-haul carriers and last-mile providers that reduce operating costs for providers and monthly service costs for consumers.
- Inform and build the capacity of local communities to drive short-term construction and long-term quality of service accountability.
- Prioritize deployments that result in generational, 30+ year assets that will serve Nevadans for decades to come.
- Grow and nurture partnerships with federal and State permitting agencies, including the Bureau of Land Management, the US Forest Service, and the Nevada Department of Transportation to ensure environmental and historic preservation is prioritized, project design and engineering are optimized, and needed permits are approved in a timely manner.

Objective 2:

By 2029, Deploy Modern, Scalable Broadband Infrastructure to Unserved and Underserved Residential and Business Locations within communities so that all Nevadans have access to affordable, reliable, and scalable high-speed internet access with minimum speeds of 100/20 Mbps scaling beyond 100/100 Mbps.

Strategies:

- Develop and administer a BEAD grant deployment program that will effectively and efficiently bring affordable, reliable, and scalable high-speed internet access to every unserved and underserved residential and business location in Nevada.

- Explore opportunities for public-private partnerships where opportunities exist.
- Engage and promote participation by Nevada's Electric and Telephone Cooperatives as well as Nevada's Investor-Owned Electric Utility in deploying high-speed internet, either as internet service providers or by leveraging existing infrastructure through pole attachment agreements.
- Promote and aggressively market opportunities for Internet Service Providers in Nevada to obtain affordable upstream bandwidth from newly constructed middle mile infrastructure needed to bring affordable, reliable, and scalable internet service to unserved and underserved markets and locations.
- Develop and deploy a range of short- and medium-term workforce development strategies to create equitable on-ramps to broadband related jobs and ensure a highly-skilled and capable Nevada-based workforce exists to close the digital divide.
- Continuously engage every community during the design and implementation of the High Speed Nevada Initiative.
- Partner with local governments and County Broadband Action Teams (BATs) to drive ongoing accountability between providers and local communities for quality of service following the completion of network deployment.
- Grow and nurture partnerships with county and municipal permitting entities to ensure unserved and underserved communities are ready for broadband infrastructure deployment.



Goal #2:

Universal Access to Digital Equity

Objective 1:

Develop and Execute a Multi-Pronged Low-Income and Middle-Class Affordability and Access Strategy that leads to increased adoption and residential broadband subscription rates.

Strategies:

- Grow and nurture partnerships with State and local governments, non-profit organizations, public schools and higher education, libraries, workforce, and other community organizations to build awareness for the Affordable Connectivity Program (ACP).
- Provide training to local governments, case workers, social service agencies, and other community-based organizations that work with and provide services to ACP-eligible households to also offer ACP enrollment assistance.
- Partner with key stakeholders, including with counties and municipalities, internet service providers, and engagements with community-based organizations, faith-based organizations, schools, and libraries, in zip codes with low ACP enrollment rates to increase enrollment in ACP by hosting ACP enrollment events.
- Strategically deploy middle mile infrastructure to high-cost regions of Nevada to reduce last-mile operating costs and improve retail affordability.
- Prioritize affordability when making infrastructure funding decisions.

- Require service provider participation in ACP as a prerequisite to receive infrastructure grant dollars.
- Promote free Community Wi-Fi access through public-private partnerships in community centers, senior centers and other communal areas.
- Create partnerships to set up free community computer labs with Wi-Fi hotspots, in remote and underserved communities throughout the state.
- Partner with State and local government agencies to leverage better connectivity and digital equity for the furtherance of broader State and local education, healthcare, workforce and economic development, public and traffic safety, civic and other goals.

Objective 2:

Develop a plan to increase access to affordable connected devices and appropriate technical support with a particular focus on the needs of covered populations that is ready for execution before network construction is complete.

Strategies:

- Create a sustainable device ecosystem that identifies a technology supply chain and manages the procurement, refurbishment, configuration, outreach, distribution and technical support of devices for low-income Nevadans.
- Explore public-private partnerships in the creation of the sustainable device ecosystem.
- Develop a strategy and partnerships to provide on-demand device technical support where Nevadans are. Include consideration for multilingual tech support in the development of the strategy.

- Partner with internet service providers to develop a plan to expand participation in and the reach of the ACP's device benefit.

Objective 3:

Develop and provide opportunities for all Nevadans to attain the skills, support, and security awareness to use reliable, high-speed broadband service and connected devices for robust participation in our society, democracy, and economy.

Strategies:

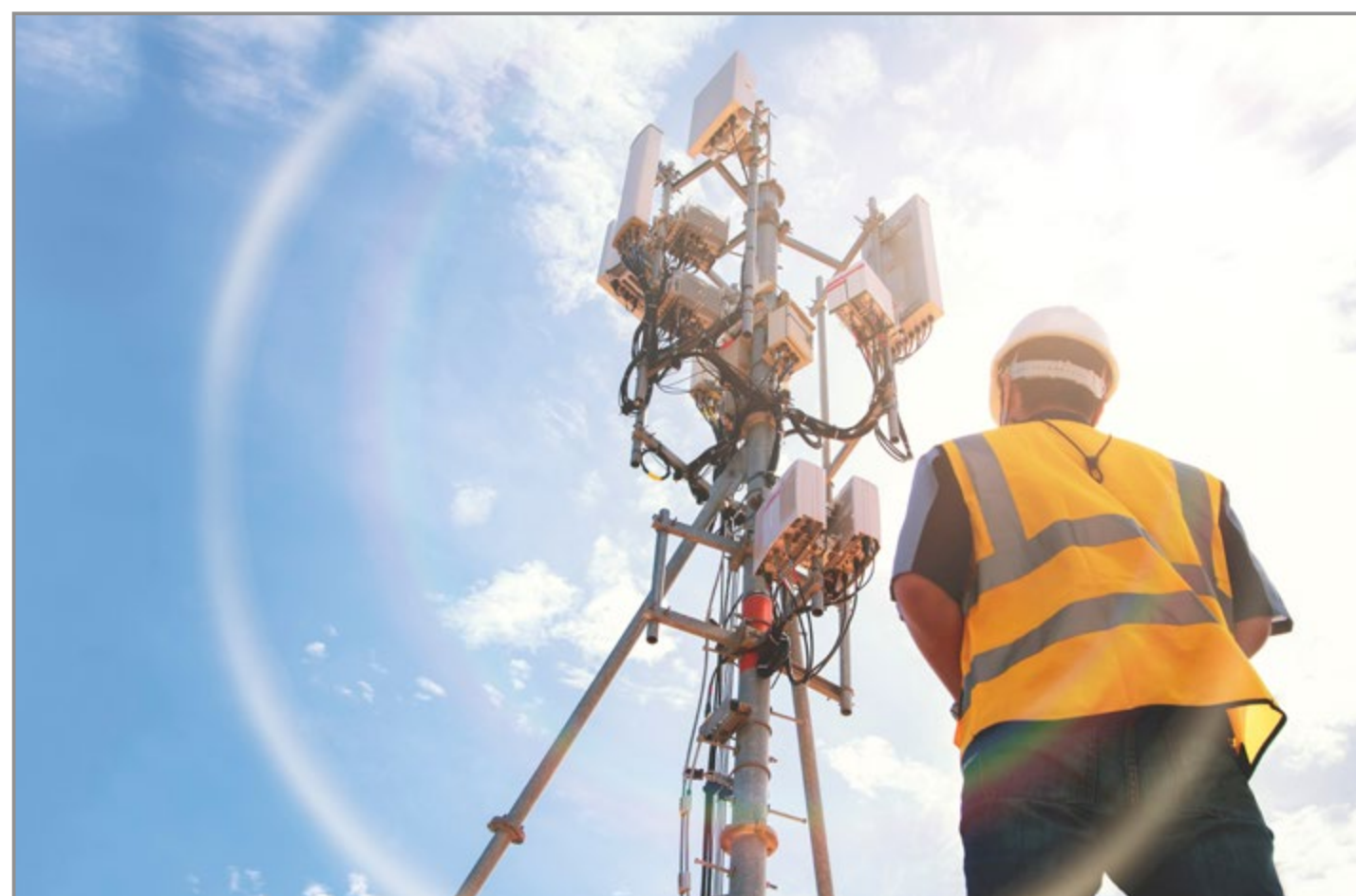
- Continue to engage communities to identify and understand the digital skills needed by covered populations.
- Collaborate with national organizations and experienced local organizations to research and identify how, where, and when to best offer opportunities for Nevadans to learn digital skills, whether formal classes in a CAI or in more informal environments. Draft statewide policies and fund necessary curriculum, professional development, and staff to offer training. Identify and build the capacity of local community-based organizations, such as community centers, senior centers, libraries, non-profit organizations, public schools, higher education institutions, adult education, and others to offer digital skills training to covered populations.
- Provide technical assistance to internet service providers wishing to fund their own digital skills training programs as a part of their subscriber promotion programs.
- Fund roaming digital navigators who will facilitate training sessions in partnership with community organizations that lack the capacity to offer digital skills trainings themselves.



5.4 Planned Activities

The recent COVID-19 pandemic demonstrated how important universal access to high-speed, reliable broadband and a connected device is for work, education, healthcare, and civic participation. Essential government services, educational and economic opportunities, business services, telemedicine, public safety, and staying connected with family and friends are all increasingly reliant on broadband networks. While many Nevadans are currently unable to access the internet due to lack of infrastructure, others are unable to afford it, do not have a suitable computer or laptop, lack the skills and confidence to use the device.

The objective of the High Speed Nevada (HSNV) Initiative is universal access to modern broadband infrastructure that provides all Nevadans at their home or business access to an affordable, reliable, and scalable high-speed internet connection. While the federal government has allocated



significant funds for broadband, needs in Nevada are also significant due to our geography, rough terrain, the remoteness of our population centers, and the lack of modern last-mile and middle-mile broadband infrastructure. The High Speed NV Initiative will combine federal, State, local, and private funding to begin to close the digital divide in Nevada and bring 21st Century infrastructure to every part of the state. The State will use all available funds to invest in long-term, life-changing infrastructure assets, resources, and programs to benefit all Nevadans in their homes, schools, and places of business for years to come.

Although infrastructure is important, we know that if a family is unable to afford an Internet subscription, or doesn't have a computer at home, they are just as unconnected as they would be in the most remote parts of our state. Affordability, access to a device, and ensuring digital literacy, collectively known as digital equity, are essential parts of the HSNV Initiative. OSIT will work diligently to promote and enroll as many Nevadans as we can in the Affordable Connectivity Program.

The success of the HSNV Initiative will be built on robust local community engagement and input. Over the last six years, OSIT has established Broadband Action Teams in every county throughout Nevada and, since the start of the pandemic, has engaged with local government and other community leaders in each county to identify and prioritize connectivity needs. OSIT plans to continue its outreach efforts following the creation of statewide infrastructure and digital equity plans that meet federal BEAD and Digital Equity funding guidelines. All investments will lead to reliable and affordable Internet connectivity that will scale to meet Nevadans' needs for bandwidth now and long into the future.

No single source of funding will be sufficient to achieve Nevada's Universal Access goal. Beyond BEAD, OSIT will weave together many different federal, state, local, and private sources of funding to bring Internet for All. OSIT will aggressively apply for grants and other dollars to supplement and stretch formula funds to ensure no location is left behind. Among these sources of funding are:

- State Fiscal Recovery Fund dollars, Local Fiscal Recovery Fund dollars and Capital Projects Fund dollars from the American Rescue Plan Act
- ReConnect grants from USDA
- Rural Digital Opportunity Funds, E-rate funds, and Rural Healthcare Funds from the FCC
- Enabling Middle Mile Broadband Infrastructure Program, Tribal Broadband Connectivity Grant Program, Connecting Minority Communities, and Broadband Infrastructure Program grants from NTIA
- State E-rate Matching Program funds
- Monetary, staff and resource contributions from other state agencies working in conjunction with OSIT to support state match requirements in federal grants
- Private matching dollars

Below is an overview of the different phases of the High Speed Nevada Initiative and the planned activities within each phase that will help the State meet its goals and objectives.



High Speed NV Initiative Phase I

The goal of Phase I of the HSNV Initiative is to build an infrastructure and digital equity foundation leading to the success of the BEAD Program and the State Digital Equity Capacity Grant Program.

- **Fiber to Government Facilities and Community Anchor Institutions (CAIs)** – In Phase I, OSIT will build fiber to over 700 unserved and underserved State and local government facilities, schools, and libraries. This project has two goals. First, provide fiber optic connectivity to government facilities and CAIs that provide essential services to students, families, clients, constituents, and patrons. Second, extend fiber optic infrastructure deeper into the State's ecosystem in preparation for bringing BEAD dollars to serve unserved and underserved residential and business locations and CAIs.
- **Train the Trainer** – Enrollment in the ACP is an integral part of OSIT's affordability strategy. Many government and non-profit organizations already interact with ACP-eligible households while providing case management and other services. OSIT will provide training to local governments, case workers, social service agencies, housing authorities and other community-based organizations that work with

and provide services to ACP-eligible households so they understand the ACP eligibility criteria and enrollment process and can offer ACP enrollment assistance to clients that are already seeking other services.

- **ACP Enrollment Events** – OSIT has mapped ACP enrollment by zip code. This analysis has shown that some zip codes have very high enrollment rates while others have very low enrollment rates. Low enrollment is both a function of lack of awareness and a need for assistance with the enrollment process. Identifying these low-enrollment areas will help OSIT strategically target its efforts to reach ACP-eligible Nevadans. OSIT will hire Digital Navigators to partner with community partners to increase awareness and enrollment rates in targeted zip codes.
- **Craft Workforce Development Plan** – OSIT prioritizes the hiring and use of Nevada workers. OSIT believes that an educational pipeline is needed to create a skilled, diverse workforce needed to complete BEAD and other infrastructure projects. A range of short- and medium-term strategies are needed to create equitable on-ramps to broadband related jobs. OSIT will continuously engage community-based and labor groups, Nevada's workforce development boards, community colleges, and other stakeholders to ensure worker voices are maintained and the impacts of the State's workforce development program are widely felt.



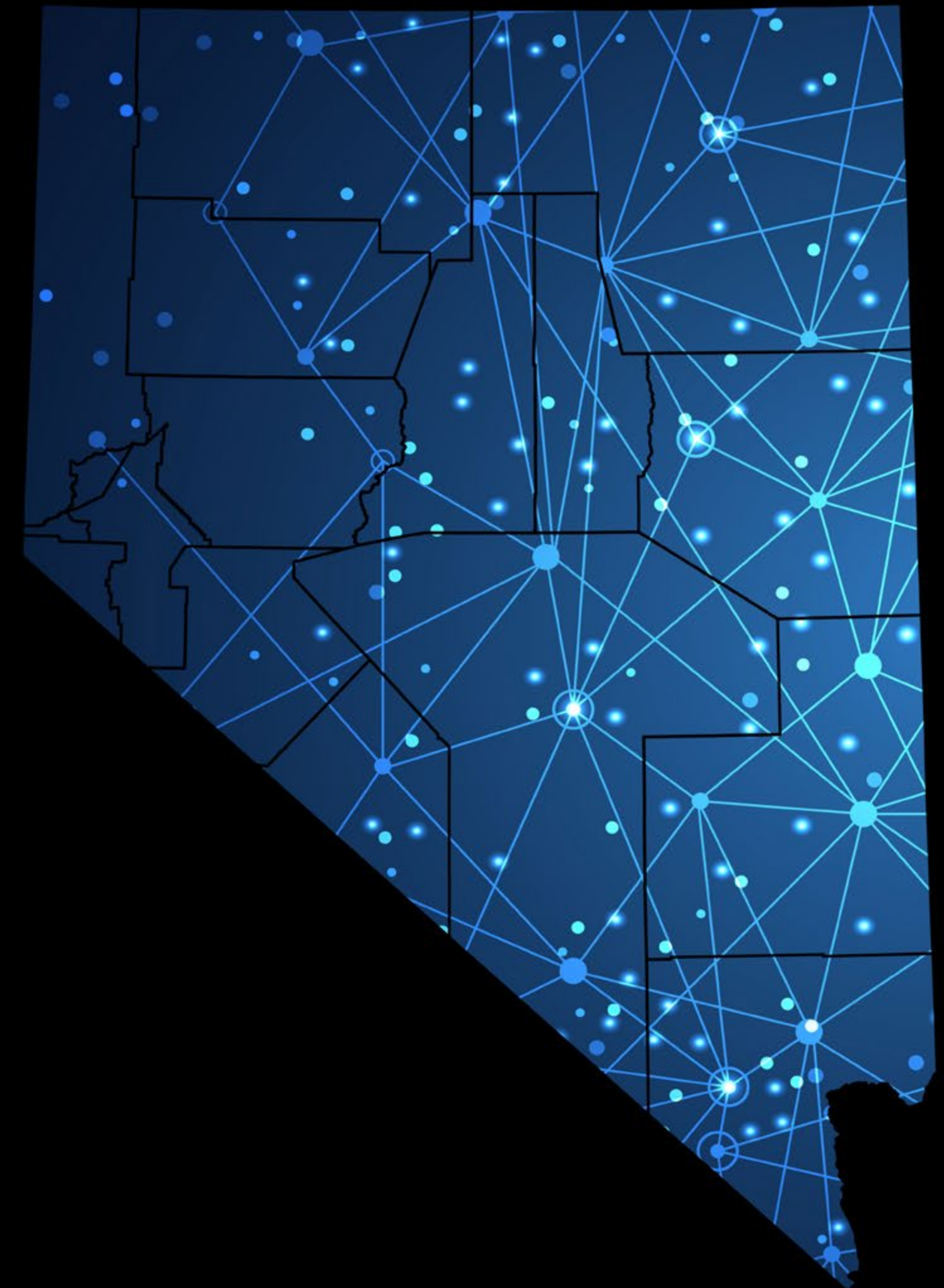
High Speed NV Initiative

Phase II

In Phase II, OSIT will continue to lay groundwork for BEAD and Digital Equity programs while also beginning deployments to serve some of Nevada's most vulnerable populations.

- **Construct the Nevada Middle Mile Network** – OSIT will design, construct, and operate a 1,000-mile middle mile network. This open-access middle-mile network will significantly expand network capacity throughout urban, suburban, and rural regions across Nevada. Operated on a non-discriminatory basis, the network will support interconnections with any provider seeking access to deliver last-mile broadband services, including those funded by BEAD. The network will provide regional network redundancy and resiliency, both for networks that serve last-mile residential areas and for government and CAIs.
- **Connecting Nevada's Low-Income Communities** – OSIT will increase internet connectivity and available speeds through construction of last mile fiber to Nevada's Public Housing Multi Dwelling Units (MDUs). OSIT has identified approximately 450 low-income MDUs with over 40,000 individual units located throughout the state. This project will bring fiber into many of the most disadvantaged communities in the state by investing in in-building wired and wireless coverage that ensures every unit within the MDU has broadband service that meets or exceed a minimum 100Mbps symmetrical service standard.

- **Tribal Connectivity** – OSIT will seek to leverage NTIA's Tribal Broadband Connectivity Program (TBCP) to increase connectivity, affordability, adoption, and digital equity on Nevada's Tribal lands. OSIT provided technical assistance to 15 Tribes to help them apply for TBCP, who subsequently were awarded over \$31 million to connect 18,99 households. During Round II of TBCP, OSIT again will provide technical assistance to Tribal participants and will continue to assist Tribes that won infrastructure grants in Round I to apply for adoption and use funding, to assist Tribes that won planning grants in Round I to apply for infrastructure and adoption and use grants, and to assist Tribes that have not applied yet to apply for both infrastructure and adoption and use grants.
- **Digital Equity Partner Asset Mapping and Development** – During the preparation of its Statewide Digital Equity Plan, OSIT created a Digital Equity Ecosystem Mapping (DEEM) tool. During Phase II and prior to awarding Digital Equity Capacity Program grants, OSIT will continue to grow its Digital Equity Partner Asset Map, begin to evaluate potential partners for grant readiness, and offer technical assistance to interested partners to improve capacity and readiness for grant awards.
- **Device Access Program** – OSIT will work with stakeholders to develop and launch a device access program that will deliver low-to-no-cost devices to those that qualify.
- **Workforce Development** – OSIT will launch its workforce development program to create a pipeline of highly skilled Nevadans ready to close the digital divide.



High Speed NV Initiative

Phase III

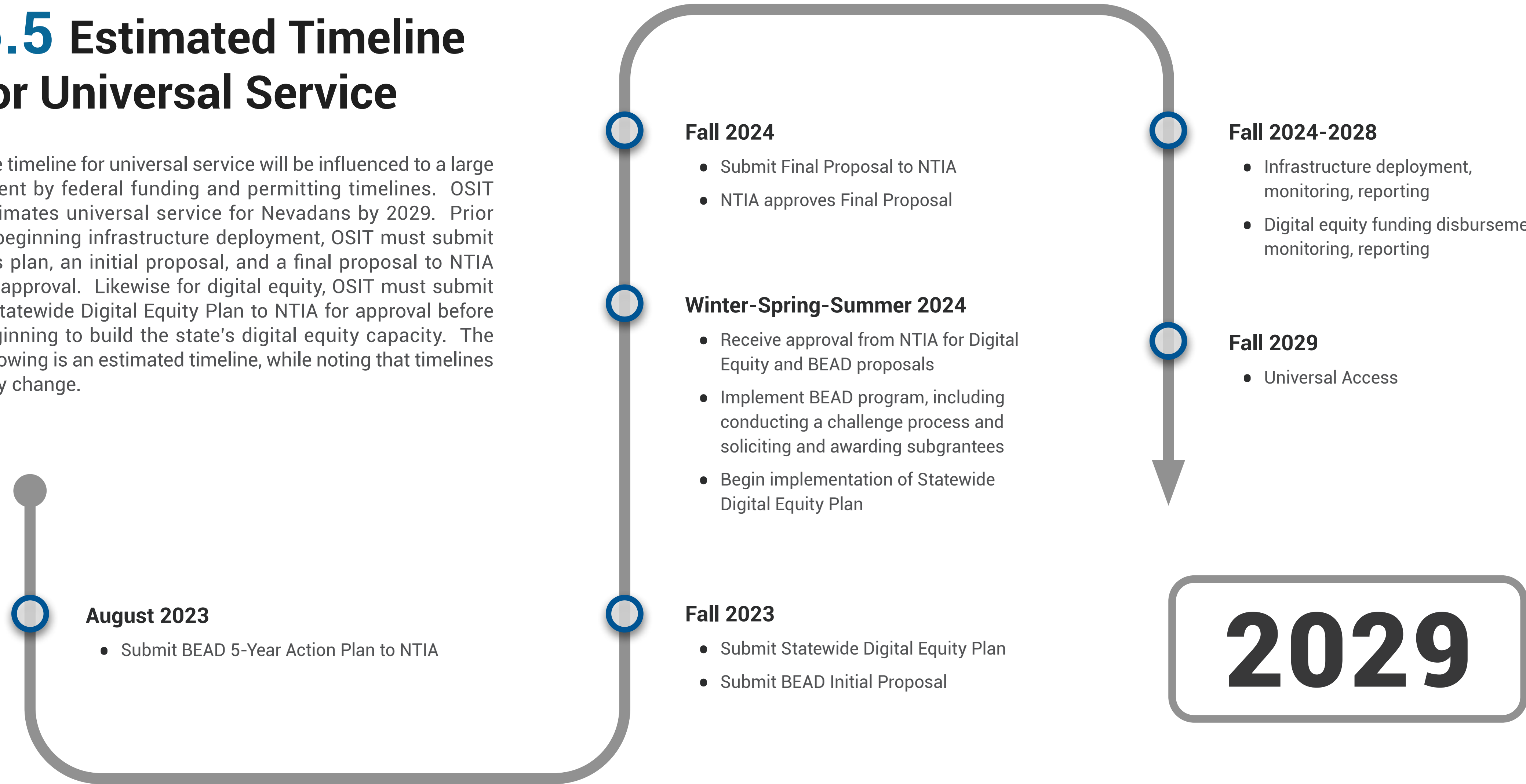
In Phase III, OSIT will begin last-mile infrastructure deployment and will accelerate work with local partners to improve digital equity.

- **Last-mile deployment** – OSIT will launch its BEAD grant program that will bring affordable, reliable, and scalable high-speed connectivity to unserved and underserved locations in all areas of the state.
- **Digital Equity** – OSIT will launch the State Digital Equity Capacity Grant Program that will create or scale high-quality, sustainable digital equity programs in partnership with local stakeholders and community organizations that will result in greater adoption rates and acquisition of the digital skills and devices needed to use the internet to learn, earn, and live well.



5.5 Estimated Timeline for Universal Service

The timeline for universal service will be influenced to a large extent by federal funding and permitting timelines. OSIT estimates universal service for Nevadans by 2029. Prior to beginning infrastructure deployment, OSIT must submit this plan, an initial proposal, and a final proposal to NTIA for approval. Likewise for digital equity, OSIT must submit a Statewide Digital Equity Plan to NTIA for approval before beginning to build the state's digital equity capacity. The following is an estimated timeline, while noting that timelines may change.



5.6 Estimated Cost for Universal Service

Due to Nevada's rugged terrain, lack of existing fiber infrastructure, the large distances between unserved locations and communities, and ever-increasing costs of deployment, the cost of universal service will be significant. OSIT is still estimating the cost and will update this section upon completion of its BEAD Final Proposal to NTIA.



5.7 Alignment

As the State Broadband Office, OSIT is responsible not only for the development of this Five-Year Action Plan but also for the development of the State's first Statewide Digital Equity Plan, per the Digital Equity Act. The development of these two plans has occurred simultaneously and in close coordination with staff from OSIT working on both projects, including performing stakeholder engagement. OSIT views the work of infrastructure deployment and digital equity as being two equally necessary tasks required for closing the digital divide. The digital divide will not be closed without both infrastructure and digital equity. Moving forward, deployment and digital equity activities will be closely coordinated to ensure newly connected residents have the knowledge, skills and tools needed to successfully connect to the internet.

The BEAD and digital equity programs are critical components of the larger High Speed Nevada Initiative. Earlier phases of the High Speed Nevada Initiative have been designed with BEAD in mind and will create the conditions needed for BEAD's success. This holistic strategy relies on multiple federal, State, local, and private sources of funding and sources of support.



5.8 Technical Assistance

OSIT's relationship with its federal partners at NTIA is critical. OSIT will continue to rely on NTIA staff for guidance through the planning, deployment, and implementation phases of the program. OSIT is appreciative of the technical assistance that NTIA provides and looks forward to continued coordination with NTIA in the next five years.

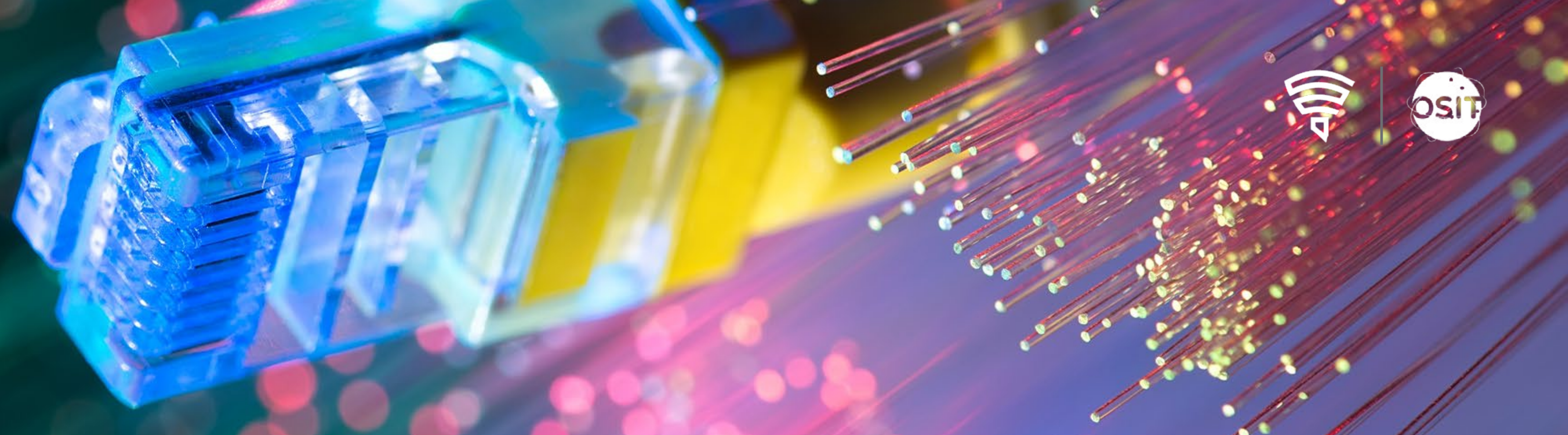


6. Conclusion

Nevada's 5-Year Action Plan describes OSIT's approach to realizing our vision for broadband equity, access, and deployment: ensuring that all Nevadans have access to a high-speed internet connection that is affordable, reliable, and scalable. We will not be successful without successfully deploying infrastructure and deploying digital equity. The work of bringing better connectivity to Nevadans should not be viewed only as an end unto itself. Rather, better connectivity supports the goals of all other government agencies: education, healthy living, workforce and economic development, transportation and public safety, and civic and community engagement. We invite all stakeholders in government, the private sector, non-profit and community-based organizations, and residents of the great State of Nevada to join with us in making universal access to broadband a reality.



7. Appendices



7.1 Appendix #1: Definitions

To understand the opportunities the broadband landscape and Nevada's opportunities to enhance broadband infrastructure, a brief explanation of the broadband infrastructure ecosystem is provided for context.

Broadband Infrastructure is also defined by three general geographic locations that define the broadband delivery system. These are Last Mile, Middle Mile and Long Haul:

Last Mile- The portion of the broadband/Internet Access delivery system (delivery system) that reaches individual residences, multi-dwelling apartments/high rises, mobile wireless devices, and small businesses. Last mile service technologies vary from fiber, copper, coaxial cable, fixed wireless, and mobile wireless technologies. Last mile connections flow upstream to small neighborhood interconnect points (telecommunications cabinets) and eventually to ward/district central offices that often serve thousands of connections.

Middle Mile- This is the portion of the broadband delivery system that connects the series of central offices to a large, regional interconnect site. These central offices or regional interconnect sites can be owned by a single telecommunications carrier or be more neutral Interconnect sites with ownership by a third party or by several telecommunications carriers. Several Internet Service Providers often create a presence in neutral interconnect sites and sell last mile providers Internet access capacity from these sites. The middle mile network is mostly fiber in cities over 15,000 residences. In small rural towns the middle mile may still be copper or in NV, millimeter wave or other high-bandwidth wireless technologies.

Along key corridors in NV, such as I-80, I-15, US-50, US-93, US-95, US-6, existing fiber paths are present but as work with the owner/provider has shown the last three years, these pathways often lack interconnect facilities in rural areas and are single pathed, meaning fiber feeding a site from only one direction along one path of fiber.

Economic development projects and last mile broadband deployments are now dependent on accessing multiple, diverse paths of fiber along these key trunk or middle mile routes because most companies require fiber from different directions to serve their sites so a single fiber cut does not cause a broadband service interruption.

Long Haul- The long-haul routes are the Interstate Highway Systems of the Internet. These are main fiber routes that connect major telecommunications interconnect points in large cities. The most valuable long-haul routes connect the neutral Internet Exchange Points in the 12 largest cities in the US (Atlanta, Boston, Dallas, Chicago, Houston, Las Vegas, Los Angeles, Miami, Seattle, San Francisco/Santa Clara, Washington DC). The next 18 largest cities continue to build value in their neutral Internet Exchange points. Owners of complete fiber or portions of fiber runs between major metro locations participate in the long-haul market.



The following diagram depicts the last mile, middle mile and long-haul portions of the broadband network.

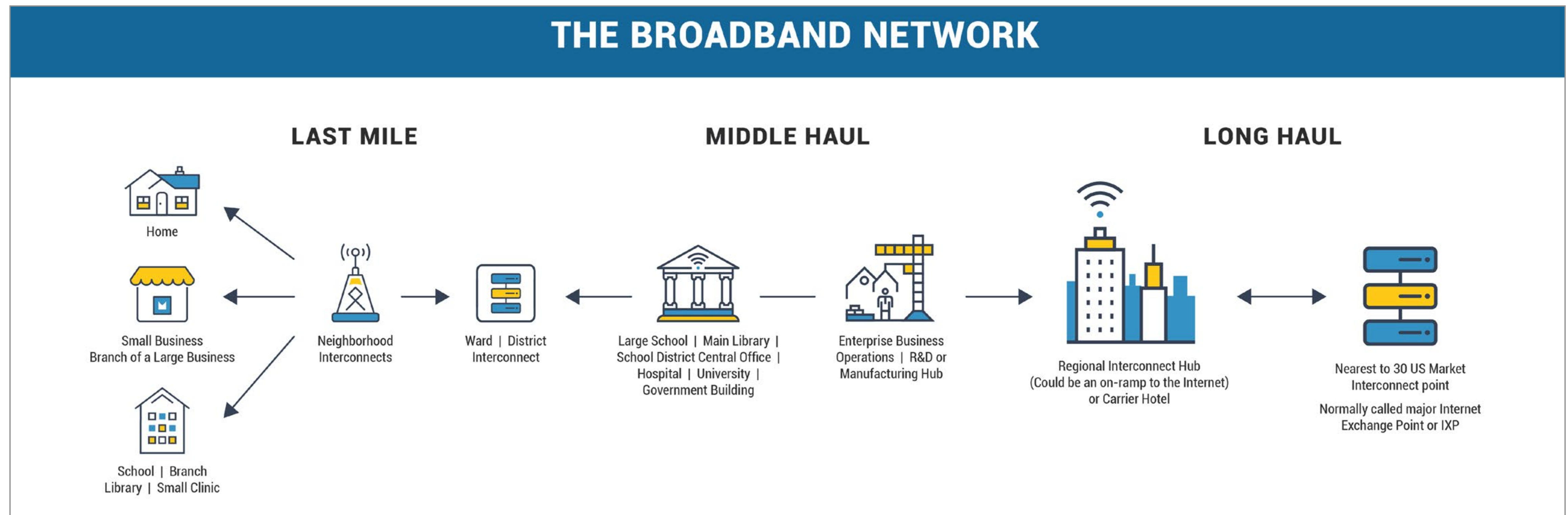


Figure 5
Diagram of Last Mile, Middle Mile and Long-haul Sections of the Broadband Network

Current and future generation broadband infrastructure takes and will take four general forms: Fiber optic infrastructure; Fixed and Mobile Wireless Infrastructure, Satellites and Interconnect Infrastructure.

Fiber Optic Infrastructure – Fiber optic cables are made of micro-sized strands of glass. Fiber optic cable is the fastest and highest capacity broadband infrastructure. Fiber optic cable is also secure and has limited potential for signal interference. Fiber optic cable makes up nearly 100% of the long haul national, international and undersea broadband networks. Fiber optic cable is the medium for the vast majority of the middle mile portion of broadband networks and is emerging as the second most common (next to coaxial cable) infrastructure in last mile home broadband networks. Currently approximately 11 million of 126 million last mile connections in the United States are fiber connections¹⁷.

The maximum capacity of fiber optic cable to carry voice, video and data traffic has not yet been reached. The capacity is limited by the routers, switches and optics used to provision service over the fiber. Right now, speeds in excess of 1 TB are being deployed in long haul networks. Many last mile markets in the US offer 10Gbps home connections over fiber. Other countries including South Korea and Japan have standardized on fiber connections¹⁸.

Mobile and Fixed Wireless- Wireless infrastructure – communications towers, water towers, electric poles, other vertical assets (buildings); antennas; spectrum are all critical in the delivery of wireless broadband service. Wireless connectivity is mainly a last mile technology that is highly dependent on the wireless signal finding fiber quickly to reduce latency, spectrum conflicts and capacity overloads. In rural and remote areas, wireless signals can be regenerated and strengthened over several (3 or 4) hops, but in higher density areas the closer the fiber backhaul the better. This applies to both the fixed wireless (connectivity to a stationary device) and mobile wireless space.

New technologies are emerging in the wireless space. 5G is the latest generation of mobile wireless technology. 5G delivers last mile speeds in the gigabit range using several bands of different spectrums. 5G service is dependent upon a higher density of shorter towers and antennas¹⁹ and more available fiber backhaul routes with greater strand counts²⁰.

Mesh technologies are also emerging in the wireless space. A mesh network can be compared to an outdoor version of a home wi-fi network. Hundreds of outdoor outfitted wireless access points are placed around a geographic area and these wireless access points form an area of contiguous high bandwidth Wi-Fi connectivity. These mesh networks easily route around

wireless access points that malfunction, lose power or are impacted by an outage. While individual connectivity to the Internet is one mesh network application, the emerging world of Internet of Things sensors, Smart City applications and other emerging applications are also improved in the mesh network environment²¹.

Satellites- Satellite broadband connectivity is usually reserved for very rural and remote areas. A signal is beamed from a satellite to a receiving dish on a customer premise. Internet traffic travels both upload and download with a fairly significant delay (latency) especially when compared to fiber or fixed wireless last mile networks. Recently, Elon Musk's SpaceX and Starlink²² divisions have been testing higher satellite bandwidth speeds through the use of thousands of **low orbiting small satellites** linked by lasers to form a "mesh network in space"²³. This is an exciting advancement particularly for rural area broadband and should be monitored closely.

Interconnect facilities- One of the issues identified as hinderance to rural broadband deployment is the investment in rural interconnect facilities²⁴. These are physical facilities, often shipping container sized huts, that connect the middle mile or long-haul segment of a network with last mile connections. As you will read later in the feasibility study, Nevada lacks interconnect facilities on rural highways like US-50, US-93, US-95 and US-6. The lack of interconnect facilities in rural and frontier areas of NV is directly related to the lack of last mile wired and wireless broadband service in these areas. The lack of interconnect facilities makes fiber paths along these routes inaccessible to provide local service.

¹⁷ <http://blog.yalebooks.com/2020/03/30/fiber-connectivity-in-the-united-states/>

¹⁸ <http://blog.yalebooks.com/2020/03/30/fiber-connectivity-in-the-united-states/>

¹⁹ <http://www.emfexplained.info/?ID=25916#5G%20working%20with%204G>

²⁰ <https://community.fs.com/blog/5-types-of-optical-fibers-for-5g-networks.html>

²¹ <https://www.electronicdesign.com/markets/energy/article/21750433/a-dozen-top-applications-for-mesh-networks#:~:text=Meshes%20also%20help%20tie%20together,monitoring%20and%20managing%20the%20bat->

<tfield.&text=Broadband%20wireless%20access%3A%20A%20mesh,DSL%20lines%20aren't%20available>

²² <https://www.starlink.com/>

²³ <https://www.theverge.com/2020/9/3/21419841/spacex-starlink-internet-satellite-constellation-download-speeds-space-lasers>

²⁴ <http://broadbandbreakfast.com/2020/09/strategies-for-interconnecting-middle-mile-and-last-mile-fiber-critical-amid-covid19-pandemic/>

