STATE POLICY RECOMMENDATIONS

As described above, the Connected Assessment process has engaged a wide variety of state and local stakeholders, many of whom used the process to develop and implement targeted, local interventions to improve broadband access, adoption, and use in their communities. In addition, though, during the course of the process, many common themes relating to Nevada state policy emerged.

In 2014, the Nevada Broadband Task Force convened many of these stakeholders and hosted two day-long workshops to identify and develop these ideas and proposals for Nevada. The workshops were held on September 15 and 17 in Las Vegas and Reno and featured speakers and discussion from more than 70 leaders in the public and private sectors. Attendees held in-depth conversations about sector and geographic challenges preventing broadband availability, adoption, and use and then held brainstorming sessions on solutions to these issues. After the workshops, these various solutions were developed and circulated to stakeholders, who were then asked to rank and vote on the importance and potential impact of these state-wide initiatives. These proposals were then presented to the Nevada Broadband Task Force for further review and consideration in this Plan.

The 2014 workshop process was specifically designed to develop and identify common themes that cut across many communities. In this Section, these recommendations are organized into four general categories:

1. Implementation and Governance of Nevada Broadband Policy

2. Improvement of Broadband Infrastructure Access in Nevada

3. Accelerating Broadband Adoption Among Nevada Consumers and Businesses

4. Increasing Broadband Utilization in Nevada Among Key Societal Sectors

IMPLEMENTATION AND GOVERNANCE OF NEVADA BROADBAND POLICY

Broadband access, and the applications it supports, is a transformative technology that is having immediate and comprehensive impact on virtually every sector of the Nevada economy, every level of government, and the social welfare of Nevadans. The Connect Nevada research described above shows an increasing reliance and dependence upon broadband technology throughout the state – as well as the risks to communities that do not have adequate access and vulnerable populations that are not in a position to fully take advantage of the technology.

Because broadband technology cuts across all of these sectors, a number of state and local governmental bodies have both a direct and indirect impact upon its proliferation and diffusion in Nevada. At the same time, broadband networks, even with the proliferation of many network providers, are largely designed and built with shared infrastructure – including highway rights-of-way, wireless towers, key Internet points of presence, and intercity fiber links. If there is one lesson to be learned from the Connect Nevada Connected Assessment process, it is that government and business policies and procedures developed independently for particular economic and governmental sectors in a bricks-and-mortar, analog age can have a significant impact on the diffusion of broadband technology.

A common theme of many local community participants, conference, and workshop stakeholders was the stated need for a central and institutional state office that would coordinate state and local policy to impact broadband access, adoption, and social use in the state.

Below are the recommendations prioritized by the workshop attendees and the Nevada State Broadband Task Force.

1.1 The State should create and fund an Office of Broadband Coordination, which will have the responsibility of overseeing implementation of the various recommendations of this State Technology Action Plan, in consultation with the Nevada State Broadband Task Force.

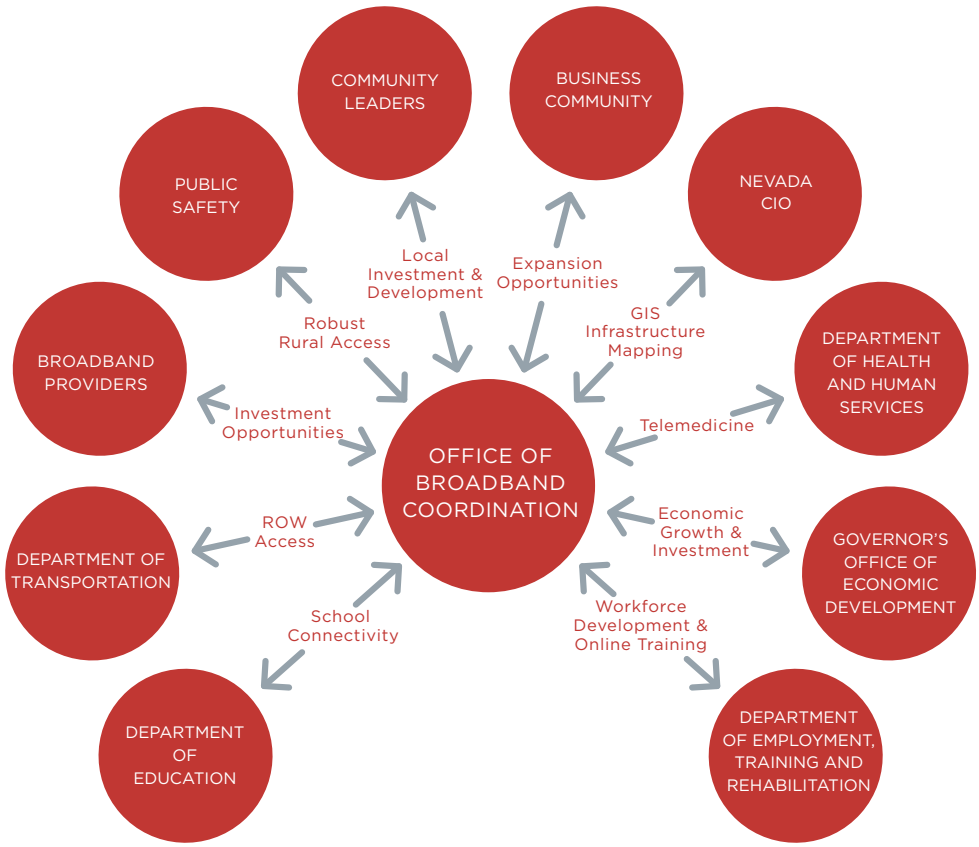
Mission and Mandate:

- Identify and help secure federal and other funding for access, adoption, and use projects (such as federal grants).
- Establish expectations for broadband service in the state.
- Help eliminate redundancies in state governance regarding broadband.

- Help transition state government to VoIP and other broadband-enabled technology.
- Develop state consortium buying policies that will facilitate broadband investment and lower costs.
- Help ensure that state policy works closely with federal broadband policy initiatives, such as the Connect America Fund and Mobility Fund.

The Office of Broadband Coordination will aid Nevada in a multitude of ways including serving as a liaison among numerous state entities in order to ensure broadband is being utilized and expanded in the most efficient manner possible as Figure 7 illustrates.

07



Additionally, the Office of Broadband Coordination will oversee any future state mapping initiatives recommended below that are funded by the state. At the end of 2014, federal funding for the Connect Nevada mapping project will cease. Moving forward, the Federal Communications Commission (FCC) will be collecting and publishing data on the availability of retail fixed and mobile broadband availability information twice a year. While that data will be useful, it will not map infrastructure facilities. The FCC will only be collecting data relating to the retail maximum offered speed for residential and business fixed broadband services. For mobile broadband services, the FCC will only collect "minimum advertised" speed, portions of which might not be publicly released. In rural areas, the FCC data will only be collected at the census block level.[6]

In contrast, the Connect Nevada mapping program directly maps infrastructure in a way that allows for the matching of broadband infrastructure to state institutional needs. One example of this approach is the targeted information and support Connect Nevada provided to the Governor's Telemedicine Working Group. As discussed below, there are similar needs in Nevada for public safety broadband infrastructure, vertical assets, and economic development opportunities. Because the FCC will only collect advertised retail service availability, even if that data were to be made available to Nevada, that data would not support those important state needs for infrastructure planning and economic development. In addition, with regard to retail broadband availability, the Connect Nevada project collects multiple speed tiers for both fixed and mobile technology and independently validates those capabilities statewide and locally. In rural areas, Connect Nevada collects broadband retail service availability at the address level, which is more granular than the upcoming FCC data process, and regularly processes inquiries from citizens, communities, and providers on service availability. This type of hands-on, local engagement allows for solutions-driven cooperation between providers and communities that has resulted in needed infrastructure upgrades.

6 *Modernizing the FCC Form 477 Data Program*, Federal Communications Commission, WC Docket No. 11-10, Report and Order, 28 FCC Red 9887, 2013. The FCC was to have started collecting this data on October 1, 2014, but the FCC suspended that data collection due to difficulties with its electronic filing Interface. See Form 477 Filing Interface Remains Closed as Technical Improvements are Implemented, Federal Communications Commission, Wireline Competition Bureau, WC Docket No. 11-10, Public Notice, DA 14-1458, Oct. 2014. It is uncertain when the FCC will release or publish any of the data it may eventually collect through its new data collection process.

1.2 The Governor should re-charter a multi-stakeholder State Broadband Task Force, with the head of the Office of Broadband Coordination. The Task Force should be chaired by the Head of the Office of Broadband Coordination, and members of the Task Force should include the private sector from the broadband and technology industry, relevant state agencies, and local leaders.

Mission and Mandate: Educate policymakers on the importance of broadband to the achievement of state economic and social welfare goals with the official charter, including:

- Identify and remove barriers to broadband access.
- Identify opportunities for increasing broadband applications and adoption in unserved and underserved areas in Nevada.
- Oversee all duties/responsibilities to achieve these goals.
- Serve as a central point of collaboration/coordination for broadband projects statewide.
- Maintain a state map that provides broadband availability and speed information.

Re-chartering should include current members of the Nevada Broadband Task Force as well as representatives from the following industries:

- Public Safety – to ensure coordination with the state's FirstNet initiative.
- Corrections – to ensure that the broadband needs of the rural population and those in correctional facilities are addressed.
- Employment, Training and Rehabilitation – to ensure the needs of workforce development/training are addressed.

IMPROVEMENT OF BROADBAND INFRASTRUCTURE ACCESS IN NEVADA

2.1 Improve public safety communications, including statewide deployment of an interoperable public safety broadband network, NV911 implementation, public safety network infrastructure mapping, and support of Nevada 211 partnership.

Mission and Mandate: Leverage broadband technologies to enhance emergency communications to and from the public.

Broadband offers a unique opportunity to achieve a comprehensive vision for enhancing the safety and security of a community's residents. Broadband can help public safety personnel prevent emergencies and respond swiftly when they occur. Broadband can also provide a community with new ways of calling for help and receiving emergency information.

For example, first responders from different jurisdictions and agencies often cannot communicate during emergencies due to disparate communication systems and the lack of integration between these systems. However, wireless broadband supports the interoperability of communications systems that would allow first responders anywhere in the nation to communicate with each other, send and receive critical voice and data to save lives, reduce injuries, and prevent acts of crime and terror.

Furthermore, with broadband, 911 call centers (also known as public safety answering points or PSAPs) could receive texts, pictures, and videos from the public and relay them to first responders. Similarly, the government could use broadband networks to disseminate vital information to the public during emergencies in multiple formats and languages. Finally, Nevada 211, a comprehensive, free connection to critical health and human services, utilizes broadband to provide information about local community services in a single, statewide location that can be accessed via voice, text, or online. Launched in February 2006, Nevada 211 is a statewide partnership that is led by the State of Nevada, United Way of Southern Nevada, United Way of Northern Nevada and the Sierra, Crisis Call Center, and HELP of Southern Nevada. The goal of this partnership is to connect any and all Nevadans to vital health and human resources and to eliminate the confusion and frustration of not knowing where to turn in a time of need.

To overcome the challenges posed by disparate communication systems and dated technology, public safety agencies should collaborate with state and federal agencies in order to improve communication across organizational and jurisdictional boundaries. This is one of the priorities of the First Responder Network Authority (FirstNet). Created by the Middle Class Tax Relief and Job Creation Act of 2012, FirstNet was established as an independent authority within the NTIA in order to establish a single nationwide, interoperable public safety broadband network.

To find out more information on FirstNet and the Nationwide Public Safety Network, visit http://www.ntia.doc.gov/category/firstnet.

Other relevant initiatives include:

- Assistance to Firefighters Grants (AFG): The primary goal of the AFG Program is to meet the firefighting and emergency response needs of fire departments and non-affiliated emergency medical service organizations. AFG funds have helped firefighters and other first responders to obtain critically needed equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire and related hazards.
- Community Connect Grant Program: The Community Connect Grant Program provides financial assistance to furnish broadband service in unserved, often isolated, rural communities. The grants are used to establish broadband service for critical facilities such as fire or police stations, while also providing service to residents and businesses.

2.2 Analyze local policies and ordinances for conduciveness to broadband build-out, and ensure coordination between state government and federal agencies regarding broadband infrastructure on public lands.

Mission and Mandate: Ensure that local policies are conducive to broadband build-out. In addition, work to ensure that Nevada government is working with federal agencies to guarantee that broadband infrastructure can be adequately and timely built on federal lands.

High capital investment costs, including permit processing, pole attachment costs, and lack of effective planning and coordination with public authorities, directly impact the case for deployment. For example, the FCC's National Broadband Plan concludes that, "the rates, terms, and conditions for access to rights-of-way [including pole attachments] significantly impact broadband deployment." The costs associated with obtaining permits and leasing pole attachments and rights-of-way are one of the most expensive cost functions in a service provider's plans to expand or upgrade service, especially in rural markets where the ratio of poles to households goes off the charts. Furthermore, the process can be time consuming. For example, the process of attaching equipment to an already-existing pole, such as moving wires and other equipment and coordinating with electric and safety codes, can take months to complete.

Firms seeking to invest in broadband infrastructure in Nevada face a myriad of governmental authorities. Eighty-one percent of the area of Nevada – more than any other state – is owned or controlled by the federal government.[7] Since adoption of the National Broadband Plan, the Federal government has increased its effort to facilitate the ability of providers to utilize Federal lands for broadband networks. In June 2012, President Barack Obama issued Executive Order 13616 (Accelerating Broadband Infrastructure Deployment) to facilitate wired and wireless broadband infrastructure deployment on Federal lands, buildings, rights-of-way, federally assisted highways, Tribal and individual Indian trust lands. The Executive Order created a Broadband Deployment on Federal Property Working Group that would serve to coordinate federal agency procedures, requirements, and land policies across 14 Federal agencies. In the first year, the Federal Working Group created a database of federal assets suitable

7 *Federal land Ownership: Overview and Data*, Congressional Research Service, June 2012, at 4 (Table 1). Of the nearly 57 million acres of Nevada owned by the Federal Government, the Bureau of Land Management owns 47.8 million acres, the U.S. Forest Service 5.7 million acres, the Fish and Wildlife Service 2.3 million acres, the National Park Service 774,751 acres, and the Department of Defense 281,442.

for broadband infrastructure uses, developed a common form for leases of federal property for broadband purposes, and developed an online platform for submission of those forms.[8] Nevada should monitor these reforms in Federal property access and work to ensure that Federal agencies fully implement the Executive Order and changes in a way that truly facilitates broadband investment that benefits Nevadans.

Local policies and ordinances in Nevada also can play a significant role in facilitating broadband investment by mitigating the high fixed costs of network construction. Incorporating and considering broadband in community planning processes, including zoning and public land policies, by local governments can improve broadband investment and access in their communities.

In particular, planning for future broadband needs by timely placement of empty conduit and ducts also can dramatically increase the pace of broadband network upgrades in Nevada. The cost of building or upgrading a network in areas where streets need to be dug up is substantially higher than the cost of building or upgrading a network where there is sufficient empty space in conduit or ducts that were placed – with foresight – years earlier. Because advance planning can lower cost of future investment, state and local policies should ensure that developers consider and ensure that adequate broadband infrastructure capacity will be in place in new developments. Such policies can include placement of adequately sized broadband conduit and ducts alongside roads and inside buildings, in order to "future proof" that development. Community and provider collaboration to problem-solve around local pole attachment and other right-of-way issues is one of the most effective opportunities to encourage faster, new deployment of infrastructure. In addition, as discussed above, mapping and knowledge of local infrastructure can facilitate and attract broadband investment and upgrades.

8 *Progress on Accelerating Broadband Infrastructure Deployment: Implementing Executive Order 13616*, Broadband Deployment on Federal Property Working Group, Aug. 2013, at 2-3 (available at: http://www.whitehouse.gov/blog/2013/09/16/accelerating-broadband-infrastructure-deployment-across-united-states.

The recommended Office of Broadband Coordination can also play a strong role in examining local policies, approaches, and best practices that can positively affect broadband investment in Nevada.

Benefits:

- Lowers cost barriers to improve the business case for broadband investment and deployment.
- Encourages good public policy and provider relations.
- Serves as a foundation for cooperative public-private partnerships relating to broadband infrastructure upgrades in Nevada.

Action Items:

- Convene a review of local policies, ordinances, and other barriers to broadband deployment and consult with community leaders, providers, utilities, and other members of the community to ensure that they are supporting policies (local ordinances, pole attachments, rights-of-way) that are conducive to broadband build-out.
- Develop an awareness campaign targeted toward community leaders to inform them of the benefits of broadband to the entire community derived from access to global resources that outweigh the need for some policies.
- Work directly with the Federal government with regard to broadband access policies for Federal lands and property in Nevada, so as to improve broadband infrastructure investment and options in Nevada.

2.3 Ensure ready and cost-effective access to poles, ducts, conduits, and rights-of-way, both privately-owned and publicly-owned.

Mission and Mandate: As discussed above, placement costs, which include cost of stringing fiber or attaching equipment to utility poles, are a significant component of broadband deployment costs. In addition, since these charges generally consist of per-pole or distance-based rental charges, high costs for leasing access to poles and rights-of-way affect deployment in distant, rural areas more than in dense urban areas.

The rates for attaching communications equipment to privately-owned poles, ducts, and attachments is subject to the federal Pole Attachment Act of 1978, which added Section 224 to the Communications Act of 1934. The Pole Attachment Act gives the FCC the authority to regulate the rates, terms, and conditions of attaching to that privately-owned infrastructure, but it specifically gives Nevada and other states the right to preempt those federal requirements.[9] The federal Pole Attachment Act of 1978 also does not regulate the rates, terms, and conditions of poles, ducts, conduit, and rights-of-way that are owned by state or local governments or railroads.

Nevada should establish, as a matter of state policy, that every infrastructure project should incorporate "Dig Once" principles, which include notification and facilitation of opportunities to lower the costs of broadband infrastructure investment.

Benefits:

- Lower costs of infrastructure deployment.
- Ensure efficient, multiple use of existing infrastructure like utility poles where feasible.
- Promote investment of broadband infrastructure in rural, distant areas where there is a need to attach to more poles or use more feet of rights-of-way per customer.

Action Items:

- Investigate utilizing Nevada's preserved authority under the federal Pole Attachment Act of 1978 to use attachment policies to promote and guide broadband investment.
- Convene workshop of related agencies, including Department of Transportation, to identify and catalog opportunities for Dig Once and joint trenching opportunities.
- Explore different methods of compensation for pole attachments and rights-of-way, including flat fees or fee rebates based on meeting broadband deployment or adoption targets.
- Educate local policymakers on the impact of pole attachment and rights-of-way policies on broadband infrastructure deployment.

9 As of this writing, 19 states and the District of Columbia have done so. See *In the Matter of Implementation of Section 224 of the Act*, Federal Communications Commission, WC Docket No. 07-245, Report and Order and Order on Reconsideration, FCC 11-50, April 2011, Appendix C.

2.4 Continue to map growth in broadband in Nevada and create more detailed broadband maps that will incorporate speed testing and validation of service speeds and map middle mile infrastructure, both lit and unlit.

Mission and Mandate: Create a more detailed map for the community regarding available speeds, enabling the technology team and community stakeholders to better understand the broadband landscape and to address residential concerns anecdotally gathered at local technology team meetings. This also allows communities to initiate informed discussions with local providers to assist in addressing gaps in coverage and potential build-out plans.

The project should encourage residents to participate in data contribution through county-level speed testing, in order to validate available local providers' speeds and to better understand adoption trends among residents. Results from these speed tests can contribute to an overlay of broadband availability and show clusters of speed trends in a given area.

Benefits:

- County-wide speed testing will assist in validating available speeds of local providers. It will also enable a more detailed speed map for the technology's team use.
- Speed tests can help providers in the local area better understand adoption/subscriber trends to market service territories and more effectively plan for build-out.
- Gaps in speed coverage maps may elicit areas of technical challenges and locations that are underserved in a given area.

Action Items:

- Host a contest encouraging local residents to complete an online speed test, over a specific duration of time.
- Market the speed test to all residents in a given area with established parameters for participation.
- Collect, analyze, and map data in a format that can inform local planning by providers/community or both.

2.5 Establish a statewide "Dig Once" policy that will easily identify opportunities for joint trenching cost savings and ensure that broadband infrastructure improvements are considered alongside other infrastructure and public works projects.

Mission and Mandate: Establish as a matter of state policy that every infrastructure project should incorporate "Dig Once" principles, which include notification and facilitation of opportunities to lower the costs of broadband infrastructure investment.

Building broadband infrastructure is costly. According to the National Broadband Plan, deploying fiber can easily cost more than $100,000 per mile – and "the largest element of deployment costs is not the fiber itself, but the placement costs associated with burying the fiber in the ground (or attaching it to poles in an aerial build)." In certain cases, these placement costs can account for almost three-quarters of the total cost of a fiber deployment.

However, with adequate planning, these costs can be decreased substantially. According to the National Broadband Plan, "the cost of running a strand of fiber through an existing conduit is 3-4 times cheaper than constructing a new aerial build." In addition, joint trenching of infrastructure projects can cut placement costs dramatically, by sharing those costs of digging among not only broadband providers but other infrastructure costs.

As a result, many states and municipalities have in recent years adopted a variety of Dig Once policies. These policies range in scope and nature, involving a notification process in which interested parties are given a notice and an opportunity to install conduits and cabling in a trench opened by another infrastructure project. The United States Department of Transportation, Federal Highway Administration has listed several best practices for Dig Once state and local policies, noting that "Dig Once and joint-use of trenches have been practices recognized by state and local stakeholders as sensible solutions to expedite the deployment of fiber along main routes when implemented as part of a cooperative planning process."[10]

10 *Successful Practices of Broadband Deployment in Highway Rights of Way*, U.S. Department of Transportation, Federal Highway Administration, Office of Policy and Governmental Affairs, May 2013, available at http://www.fhwa.dot.gov/policy/otps/successprac.cfm.

The U.S. Department of Transportation noted the example of the Utah Department of Transportation (UDOT). UDOT installs empty conduit suitable for fiber optic placement during highway construction and then coordinates with providers on need and demand for space in that conduit. UDOT meets with telecom companies every two months on infrastructure projects, and has established a single point of contact for broadband providers. Annually, providers submit a list to UDOT of areas of need, and UDOT provides providers interactive online tools, ESRI maps of roads, fiber, and conduit.

Benefits:

- Lower costs of infrastructure deployment when done in conjunction with other infrastructure improvements (such as highway construction).
- Promote and facilitate integration of broadband infrastructure as part of local and regional economic development infrastructure initiatives.

Action Items:

- Convene workshop of related agencies, including Department of Transportation, to identify and catalog opportunities for Dig Once and joint trenching opportunities.
- Educate local policymakers on Dig Once best practices and opportunities.

2.6 Establish state funding or match dollars that will support broadband deployment in areas without adequate service, which could leverage and maximize the impact of other federal broadband infrastructure funding opportunities, such as the Connect America Fund.

Mission and Mandate: In addition to lowering the costs of private infrastructure investment, the State of Nevada can also facilitate direct investment into broadband infrastructure, particularly in rural areas without adequate access today. While improvements to management of state rights-of-way and access to poles can facilitate private direct investment statewide, direct investment by Nevada can be targeted to areas of particular need, such as rural areas without service today or areas to which improved broadband access is important to economic development, such as remote industrial sites.

In 2011, Governor Sandoval proposed to invest $3 million of state funds into broadband infrastructure projects in rural Nevada. A number of states have implemented similar programs, operated generally through state grants or similar approaches to private provider applicants. For example:

Minnesota is implementing a new, $20 million Border-to-Border Broadband Development grant program. The program is being implemented by the newly created Office of Broadband Development, in the Minnesota Department of Employment and Economic Development. Minnesota has set state broadband goals and targets and is now soliciting applications from private industry. This project is assisted by infrastructure mapping and research work conducted by Connect Minnesota, an affiliate of Connect Nevada. The grant program will give priority to applications to serve areas that do not have access to 4 Mbps down/1 Mbps up fixed broadband service in the state and will also assign projects that will offer new or substantially upgraded service to community anchor institutions (CAI), telemedicine, economically distressed areas of the state, and projects that include digital literacy training and broadband adoption components. To qualify, an applicant must provide at least 50% in its own funds to the project.[11]

Illinois is implementing a Gigabit Communities Challenge grant program that will award up to $6 million in grants to projects to bring ultra-high speed broadband to Illinois communities. Open to any private or public organization, the program will result in seed funding awards to build or expand world-class broadband networks in Illinois. Each proposal should outline a viable plan to connect at least 1,000 end users to an ultra high-speed broadband network. The program will target network upgrades to improve employment opportunities and enhance economic development in order to serve as "proofs-of-concept."[12]

New York has funded a number of broadband infrastructure initiatives through its regional economic development councils and its Connect NY broadband grant program, with grants that range in size from $70,000 to over $5 million.[13]

11 *Border-to-Border Broadband Development Grant Program*, Minnesota Department of Employment and Economic Development, http://mn.gov/deed/programs-services/broadband/grant-program/index.jsp. Applications for the program were due in October 2014.

12 Illinois Gigabit Communities Challenge, http://www2.illinois.gov/gov/gigabit/Pages/Status.aspx.

13 New York State Broadband Program Office, http://nysbroadband.ny.gov/state-funding.

Direct state funding of broadband expansion initiatives at this time could also be beneficial if it worked in concert with the FCC's Connect America Fund. As of this writing, the FCC is in the final stages of offering over $6.4 million per year in annual subsidies to upgrade service to over 13,000 homes and businesses in the CenturyLink, AT&T, and Frontier service territories in Nevada. In the event those providers do not elect to receive this subsidy in exchange for a build-out commitment, the FCC plans to auction those subsidies to other broadband providers next year. Earlier this year, the FCC proposed that if it conducts that auction, it would consider providing a "bidding credit" in areas in which a state has decided to invest state funds to support that build-out.[14] Were the FCC to implement this rule, a Nevada infrastructure grant program would increase the chances of a Nevada provider in submitting a winning bid for federal broadband infrastructure subsidies.

Benefits:

- Target broadband investment to areas of need.
- Incentivize private investment and creative public-private solutions to broadband challenges in rural Nevada.
- Potentially leverage and increase chances of receiving federal Connect America Fund subsidies in rural Nevada.

Action Items:

- Identify target areas of state, from both service availability and economic development perspectives.
- Investigate similar state programs to those of Minnesota, New York, and Illinois.
- Ensure accuracy of broadband availability information and data before awarding any grant.
- Educate and perform direct outreach to broadband providers and local communities in rural areas, in order to begin process of developing innovative public-private initiatives that could be funded through such a grant program.

14 *In the Matter of Connect America Fund*, Federal Communications Commission, WC Docket No. 10-90. Report and Order and Further Notice of Proposed Rulemaking, FCC 14-98, July 2014, at paras 97-101.

2.7 Complete a Vertical Assets Inventory to facilitate wireless broadband build-out.

Mission and Mandate: Develop a single repository of vertical assets, such as communications towers, water tanks, and other structures potentially useful for the support of deploying affordable, reliable wireless broadband in less populated rural areas or topographically challenged areas.

Wireless communications equipment can be placed in a wide variety of locations, but ideally, wireless providers look for locations or structures in stable conditions, with reasonably easy access to electricity and wired telecommunications, and with a significant height relative to the surrounding area. "Vertical assets" are defined as structures on which wireless broadband equipment can be mounted and positioned to broadcast a signal over as much terrain as possible. These assets include structures such as cell towers, water tanks, grain silos, and multi-story buildings.

The lack of easily accessible and readily usable information regarding the number and location of vertical assets prevents the expansion of affordable, reliable wireless broadband service. Wireless broadband providers must determine if it is worth the effort and expense to collect and analyze this data when making investment decisions. Public sector organizations are faced with the same challenges. A centralized and comprehensive vertical assets inventory can help wireless broadband providers expedite decisions regarding the deployment of affordable, reliable broadband service in rural areas.

As discussed above, the Federal government is developing an inventory of Federal property and assets available for lease to support wireless broadband build-out.[15] The State of Nevada and local governments can undertake a similar inventory process. The recommended Office of Broadband Coordination can serve as a facilitator of this information exchange, and help coordinate the availability of information about assets from various state and local government entities that the respective agency would be willing to lease to broadband providers. Having this information readily available ina central location would attract wireless infrastructure investment into Nevada as opposed to other states.

15 See note 8, supra.

Benefits:

- The vertical assets inventory provides data for private and public investment decisions, lowering the initial cost of efforts needed to identify potential mounting locations for infrastructure.
- The inventory can encourage the expansion of affordable, reliable wireless broadband services to underserved areas by shortening project development time.

Action Items:

- Identify or develop a vertical assets inventory toolkit to provide guidelines to identify structures or land that could serve as a site for installation of wireless communications equipment.
- Collect data that includes vertical asset type, owner type, minimum base elevation, minimum height above ground, and location.
- Identify and map elevated structures using the community's GIS resources. The resulting database should be open-ended; localities should be encouraged to continuously map assets as they are made available.

ACCELERATING BROADBAND ADOPTION AMONG NEVADA CONSUMERS AND BUSINESSES

3.1 Incorporate business and zoning information into the Nevada broadband maps, specifically to analyze business access in areas for possible economic development.

Mission and Mandate: Empower the technology team and local economic development professionals to better understand the broadband landscape in order to support current businesses' technology needs and to recruit new businesses to the area.

By collecting business and zoning information as a layer on the availability map, communities can analyze business access, specifically in regions considered for possible economic development.

Benefits:

- Local leaders and economic development professionals are better equipped to answer questions about properties' broadband readiness.
- Knowledge of broadband availability can be an important economic driver in marketing of a particular area to new business.

Action Items:

- Identify additional resources for zoning layers (e.g., GIS maps).
- Create an overlay to the last mile service maps provided by Connect Nevada.
- Discuss service needs with current and potential businesses.
- Analyze maps for gaps in service for business.
- Use broadband in awareness campaigns as a driver for new business recruitment.

3.2 Develop or identify a Broadband Training and Awareness Program for small and medium businesses, Community Anchor Institutions, and other entities.

Mission and Mandate: Businesses and other community institutions adopt and use broadband-enabled applications such as websites, social media, and e-commerce, resulting in increased efficiency, improved market access, reduced costs, and increased speed of both transactions and interactions.

Methods of implementing such a broadband awareness program include, but are not limited to, facilitating awareness sessions, holding press conferences led by community leaders, inviting speakers to community business conferences or summits, and generating public service announcements. It is also important to educate local businesses about Internet tools that are available at minimal or no cost to them through classes such as website and social media instruction.

A training program, or entry-level "Broadband 101" course, could be used to give small and medium businesses and other community institutions an introduction on how to capitalize on broadband connectivity, as well as more advanced applications for IT staff. In addition, training should include resources for non-IT staff, such as how to use commerce tools for sales, streamline finances with online records, or leverage knowledge management across an organization. Additional training might include:

- "How-to" training for key activities such as online collaboration, search optimization, cybersecurity, equipment use, and Web 2.0 tools.
- Technical and professional support for hardware, software, and business and organizational operations.
- Licenses for business applications such as document creation, antivirus and security software, and online audio and videoconferencing.
- Website development and registration.
- Basic communications equipment, such as low-cost personal computers and wireless routers.

Benefits:

- Provides entrepreneurial support.
- Helps community institutions operate more efficiently.
- Eliminates knowledge gap about how best to utilize broadband tools, increasing productivity.
- Promotes business growth and workforce development.
- Empowers small businesses to achieve operational scale more quickly by lowering start-up costs through faster business registration and improved access to customers, suppliers, and new markets. According to Connect Nevada's 2014 Business Technology Assessment, Nevada businesses that are using the Internet bring in approximately $160,000 more in median annual revenues than their unconnected counterparts.

Action Items:

- Identify federally or state sponsored business support programs (e.g. Chamber of Commerce, SBA, EDA, agriculture, or manufacturing extension) that include assistance with broadband or IT content.
- Work with the local chamber and/or the libraries to expand on existing programs that promote e-commerce, such as free websites and social media development.
- Identify or develop a business/community institution awareness and training program.
- Partner with providers to sponsor workshops.
- Identify or develop online training modules. For example, the Southern Rural Development Center, in partnership with National Institute of Food and Agriculture, USDA, administers the National E-Commerce Extension Initiative. As the sole outlet nationally for e-commerce educational offerings geared at Extension programming, the National

E-Commerce Extension Initiative features interactive online learning modules. In addition, the program's website offers a library of additional resources and a tutorials section for greater explanation on website design and function. Modules and presentations include: A Beginner's Guide to E-Commerce, Doing Business in the Cloud, Electronic Retailing: Selling on the Internet, Helping Artisans Reach Global Markets, and Mobile E-Commerce. Examples can be found at: http://srdc.msstate.edu/ebeat/small_business.html#.

3.3 Provide adequate bandwidth to all community mental health facilities in Nevada in order to support sufficient telemedicine and other institutional needs.

Mission and Mandate: Connect mental health facilities, particularly in rural parts of Nevada, to broadband in order to ensure the safety, health, and efficient operations for employees and clients.

For mental health facilities in Nevada, the need to connect to broadband is crucial for the operational efficiency, success, and safety of the institutions. Due to the remote location of many of these facilities, access struggles remain an infrastructural challenge. In addition to basic access, mental health facilities require adequate bandwidth capacities for a myriad of uses including telehealth, medication management, initial assessment, and medical records.

Action Items:

- Work with the state of Nevada to map current broadband capacities for all mental health facilities in the state.
- Identify bandwidth needs based on the mental health facility's size and uses.
- Partner with providers to identify potential solutions for bringing broadband to even the most rural of these areas.
- Serve the state's correctional facilities by ensuring broadband and telemedicine capabilities are available for inmates.

INCREASING BROADBAND UTILIZATION IN NEVADA AMONG KEY SOCIETAL SECTORS

4.1 Connect all K-12 school classrooms to the Internet in order to facilitate implementation of the Nevada Department of Education's Nevada Ready 21 Plan prioritizing technology-rich learning.

Mission and Mandate: Facilitate the connection of all classrooms to broadband Internet so that teachers and students can take full advantage of global educational resources such as those outlined in the Nevada Ready 21 plan (see Appendix 2). Prioritize an educational plan centered on technology learning, such as STEM education, by enabling effective 1:1 use among students.

A K-12 broadband network should provide adequate performance and reach, including abundant wireless coverage in and out of school buildings. "Adequate" means enough bandwidth to support simultaneous use by all students and educators anywhere in the building and the surrounding campus to routinely use the Web, multimedia, and collaboration software. To reach the goal of sufficient broadband access for enhanced K-12 teaching and learning and improved school operations, the State Educational Technology Directors Association (SETDA) recommends that broadband speeds in schools should equate to a minimum of 100 Kbps per student/staff. However, given that bandwidth availability determines which online content, applications, and functionality students and educators will be able to use effectively in the classroom, additional bandwidth will be required in many, if not most, K-12 districts in the coming years.

In order to evolve with technology, school districts must continue to update local educational policies and curriculum, assess their broadband and classroom technology needs, evaluate the professional development requirements of teachers, and provide tech support.

With the proper connections available to classrooms, the implementation of the Nevada Ready 21 plan will be more efficiently completed. Nevada Ready 21 transforms K-12 education by engaging all students in a personalized, learner-centered education. By purposefully infusing technology into students' daily experience, Nevada Ready 21 teachers will provide students with a twenty-first century education that builds a vibrant, diverse economy. Without serious and significant investment in curricula, long-term professional development, and the technology and infrastructure that support the development of these skills, our schools face the impossible challenge of developing twenty-first century students within a twentieth century educational system.

Benefits:

- Students are trained by skilled educators who value connected, personalized, student-centered learning.
- Students have continuous access to a personal, portable device that is connected wirelessly to the Internet.
- Students can actively utilize school computers to access rich, multimedia-enhanced educational content and the Internet.
- Students can post their content (including audio and video podcasts) to school learning management systems, access their e-textbooks and get their assignments online, and collaborate daily across the network with other students via wikis and other Internet-based applications.
- Teachers can videoconference or download streaming media to classrooms and take their students on virtual field trips to interact with subject-area experts.
- School systems can use online courses.
- Teachers can actively participate in online professional learning communities to share lessons and to participate in professional development.
- School systems can increase learning time by extending learning beyond the classroom walls.
- School systems can foster Individualize learning and increase student engagement in school.
- School systems can encourage self-directed learning.
- School systems can enable parents to more effectively support their children at home.

Action Items:

- Assess current and future bandwidth needs.
- Utilize E-Rate funding. E-Rate is the commonly used name for the Schools and Libraries Program of the Universal Service Fund, which is administered by the Universal Service Administrative Company (USAC) under the direction of the Federal Communications Commission (FCC). The program provides discounts to assist most schools and libraries to obtain affordable telecommunications and Internet access. Funding is requested under four categories of service: telecommunications services, Internet access, internal connections, and basic maintenance of internal connections. Discounts for support depend on the level of poverty and the urban/rural status of the population served and range from 20% to

90% of the costs of eligible services. Eligible schools, school districts, and libraries may apply individually or as part of a consortium.

- If broadband capacity is lacking at the local level, seek partnerships with other local high-capacity demand institutions, including local civic leaders, government entities, public safety agencies, libraries, and hospitals or clinics, in a coordinated effort to aggregate local demand needs for increased broadband capacity and service. By aggregating demand within a local community, these institutions will be able to demonstrate to interested broadband providers existing pent-up demand and help justify private investments to bring greater capacity backhaul service to that community. That increased backhaul capacity can in turn benefit the entire community.

- Follow timeline and recommendations set forth in Nevada Ready 21 for development of 8 defined areas for a successful education technology program: infrastructure, instruction, professional development, communication, leadership, advancement of a state program team, evaluation and assessment, and finance.

4.2 Promote telemedicine expansion statewide, particularly in rural areas.

Mission and Mandate: Deliver improved healthcare services to rural residents. Project should aim to promote the delivery of healthcare services from a distance using video-based technologies. Telemedicine can help to address challenges associated with living in sparsely populated areas and having to travel long distances to seek medical care – particularly for the elderly or patients with chronic illnesses. It also addresses the issue of the lack of medical specialists in remote areas by awarding access to specialists in major hospitals situated in other cities, states, or countries. While telemedicine can be delivered to patient homes, it can also be implemented in partnership with local clinics, libraries, churches, schools, or businesses that have the appropriate equipment and staff to manage it. The most critical steps in promoting telemedicine are ensuring that patients and medical professionals have access to broadband service, understand the main features of telemedicine, are aware of the technologies required for telemedicine, and understand how to develop, deliver, use, and evaluate telemedicine services.

One relevant funding opportunity includes the Distance Learning and Telemedicine Loans and Grants Program. USDA provides loans and grants to rural community facilities (e.g., schools, libraries, hospitals, and tribal organizations) for advanced telecommunications systems that can provide

healthcare and educational benefits to rural areas. Three kinds of financial assistance are available: a full grant, grant-loan combination, and a full loan. Connected Nation has offered tools to the Governor's Telemedicine Working Group over the last several months, including maps indicating medical facilities and available connections. The data collected includes both publicly available and confidential information on network location and capacity. The Governor's Telemedicine Working group is thus using this analysis to identify both gaps and solutions for connecting important medical facilities across the state. This work demonstrates how a solutions-oriented, public-private broadband mapping initiative can improve the quality of life for Nevadans that a reliance on existing public resources alone would not necessarily have achieved. For an example of this work, see Appendix 1.

4.3 Build off the progress of the Connected program by implementing permanent, community-based Technology Awareness Programs.

Mission and Mandate: Organize, promote, and deliver a technology awareness program that would increase utilization of technology resources in the community.

Project should conduct an extensive advertising campaign to raise awareness about the benefits of broadband and related technology. Develop a strategy to help the community become more aware of the benefits associated with Internet and computer adoption in their daily lives and activities. Methods of delivery include, but are not limited to, classroom style awareness sessions, press conferences led by community leaders, having a speaker at a community event, posting community posters, handouts, and public service announcements.

Additionally, the campaign should specifically target technology non-adopters. By using established media, the campaign reaches non-adopters where they are. Public radio, broadcast and cable TV, utility bill stuffers, and print newspapers have been utilized to reach households of many types. The public awareness campaign should focus on helping residents, particularly those from underserved communities, understand the personal value they can derive from an investment in information technology.

There are also opportunities to leverage existing resources to expand and enhance workforce-training programs, encourage more post-secondary education, and create additional awareness within the community in regards to global resources. It is important to support the outcomes of awareness training with the development of technology training programs that will then teach community members how to use the technology.

Benefits:

- Success is achieved when a community experiences increased usage of computers and the Internet, improved basic computer skills, increased use of technology in day-to-day operations of a community, and increased access to economic opportunities.

Action Items:

- Determine the type of public awareness campaign that is appropriate for your community. Connect Ohio's statewide Every Citizen Online public awareness campaign provides an excellent case study of a professionally developed campaign.[16]
- Create a centralized technology portal/website that promotes local technology resources for use by residents. Resources would include calendars (promoting local tech events and showing available hours at public computing centers), online training resources, and local computer resources.

ESTABLISHING PRIORITIES FOR STATE POLICY

Following the workshops in Reno and Las Vegas, workshop attendees and Nevada Broadband Task Force members were asked to prioritize the solutions mentioned above. Below are the results of those rankings showing that the number one issue these leaders find of highest priority is the establishment of an Office of Broadband Coordination, followed by public safety and education improvements.

16 Connect Ohio Public Awareness Campaign, http://connectohio.org/public-awareness-campaigns.

SOLUTION PRIORITIES FOR STATE POLICY

AVERAGE SCORE	IMPLEMENTATION	ACCESS	ADOPTION	SOCIAL USE
5	Create and fund an Office of Broadband Coordination			
5.2		Improve public safety communications through broadband		
5.6				Connect all Nevada K-12 school classrooms to the Internet
5.8	Re-charter a multi-stakeholder State Broadband Task Force			
5.9		Analyze local policies and ordinances for conduciveness to broadband build-out and analyze federal and state coordination		
6.3		Ensure ready and cost-effective access to poles, ducts, conduits, and rights-of-way		Promote telemedicine expansion
7.2		Continue to map growth in broadband creating more detailed maps		
7.7		Establish a statewide dig once policy		
8.5		Establish state funding or match dollars to support broadband deployment and maximize federal opportunities		
8.6			Incorporate business and zoning information into broadband maps	
9.8			Develop or identify broadband training and awareness programs for businesses, CAIs, and other institutions	
11.5			Provide adequate bandwidth to all community mental health facilities	
11.8				Implement permanent, community-based technology awareness programs
11.9		Complete a vertical assets inventory		