



Written Testimony of

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*Before the*

Senate Subcommittee on Communications, Technology, and the Internet

Field Hearing on "Connecting Urban and Rural America:  
The State of Communications on the Ground"

August 19, 2013

Subcommittee Chairman Mark Pryor, and distinguished members of this panel, thank you for the opportunity to participate in today's field hearing on the state of communications in Arkansas and the impact broadband can have on improving consumer access to telemedicine, education, and business development.

My name is David Merrifield, and I am the Executive Director of the Arkansas Research and Education Optical Network, or ARE-ON. I am a 36-year employee of the University of Arkansas, having served in Information Technology roles throughout my career, including the development and deployment of the Internet in higher education in Arkansas from the very beginning. I also hold an appointment by Governor Mike Beebe on the Arkansas State Technology Council.

ARE-ON is a not-for-profit consortium created to develop and apply advanced communications technologies to support, enhance, and elevate education, research, public service, and economic development throughout the State of Arkansas. We were established in 2008 by an agreement among the public, four-year universities in Arkansas. Our members include all of the four-year universities as well as the nearly two dozen two-year community colleges that make up the Arkansas Association of Two-Year Colleges.

ARE-ON operates a high-speed network that connects all of our four-year university members, and soon, most of the two-year colleges within the state. Our network is an optical network. That is, the network utilizes dark fiber optic cable throughout, which is then lit with our own equipment to create the communications links that tie our universities and colleges together. I want to draw your attention to an important distinction about the ARE-ON network. We own and operate the equipment that provides the light that passes from city to city, university campus to university campus, over fiber optic cable rather than purchasing traditional communications services from providers. This gives us enormous flexibility to uniquely tailor our network to the often demanding needs of our community of higher education institutions.

ARE-ON has from its inception focused on delivery of extremely high-speed broadband networking to its higher education member institutions. Besides providing access to the general commodity Internet, our robust state network connects our members to each other, to national research and education networks such as Internet2 and National LambdaRail, and to our peer state networks in neighboring states, including Oklahoma, Texas, Louisiana, and Tennessee. ARE-ON is one of nearly forty state-based networks throughout the United States, most of which utilize their own optical networking infrastructure to serve their respective constituents of educational and public institutions.

ARE-ON has also worked to create a leadership role in enabling the development and use of applications that leverage the high-speed network to do research and education in new and innovative ways. Broadband access without limitations permits our users to find new approaches to educational and research challenges.

We encourage our universities and colleges to collaborate with their peers and colleagues statewide, nationwide, and internationally through the network. Such collaboration is often not possible without the ability to exchange large amounts of data or to effectively share resources such as scientific instrumentation or high performance computing clusters across the network.

Researchers, faculty, and students continue to stretch the bounds of the available networking infrastructure. Researchers utilize high performance large-scale computer clusters and huge amounts of disk storage to study everything from genomics, drug interactions, weather and climate, nanoscale technologies, marketing, and economics. Video is indispensable, for educational content delivery, day-to-day communications, entertainment, and so on, and before long today's high definition video content will give way to ultra high definition, creating an even larger demand for high-speed broadband networks.

Our choice to use dark fiber and optical networking technology was both deliberate and by design. Fiber optic cable provides enormous capacity and scalability. Today our members enjoy connection speeds up to 10 gigabits per second. Current technology enables us to increase this to 100 gigabits per second simply by swapping out electronics on the ends of the fiber, and technology is in development to raise the bar to terabit speeds. Our goal has been to build network infrastructure that not only meets the needs of today, but also has the scalability and flexibility to meet the needs of our members well into the future.

In 2010 the University of Arkansas System received a \$102 million grant<sup>1</sup> through the U.S. Department of Commerce under the National Telecommunications and Information Administration's (NTIA) Broadband Technology Opportunities Program (BTOP). ARE-ON is a sub-recipient of that grant, receiving \$41.2 million to expand its existing fiber optic network to connect one additional four-year public university and twenty-two (22) two-year community colleges. In addition, the ARE-ON fiber optic infrastructure provides a backbone network over which the University of Arkansas for Medical Sciences, as primary grant recipient, has connected over 450 healthcare institutions statewide to form the Arkansas e-Link Network. Our use of wave division technology in the optical network enables us to overlay multiple networks across our backbone, such as Arkansas e-Link, via dedicated, secure links.

The ARE-ON network currently has over 2,200 miles of fiber optic cable extending into five states. Much of this cable comes from commercial fiber optic cable providers and telecommunications companies, although ARE-ON has itself constructed nearly 100 miles of its own fiber to connect the leased intercity cables to our university and college campuses.

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<sup>1</sup> Broadband Technology Opportunities Program (BTOP) *Arkansas Healthcare, Higher Education, Public Safety and Research Integrated Broadband Initiative Project*, Grant Award # NT10BIX5570102

I want to point out that ARE-ON would not be possible today without access to the dark fiber from its commercial providers. The costs for overbuilding these providers are simply too high and doing so would have not served the best interests of the citizens of this state. When ARE-ON first approached providers in search of available fiber optic cable, there was much skepticism about the mission and intent of our organization. Some companies expressed concern that ARE-ON was going into competition with them, ultimately resulting in loss of their customers and revenue. We believe that the opposite has been the experience, however.

Throughout the development of the ARE-ON network, especially with the expansion of the network through the BTOP grant, our providers have benefited substantially from the investments and funding received through ARE-ON's long-term capital leases of dark fiber. Those investments have enabled providers to construct more fiber optic cable to extend their networks, to reach more customers, to access more affordable providers of telecommunications and Internet services, and to provide better rates and service to their customers. While ARE-ON's ultimate goal has been to form a network for the benefit of its higher education institutions, the commercial and residential customers of our providers have received benefits also. In many cases, these customers are exactly the underserved and unserved population of broadband users in rural areas that BTOP targeted.

It is our opinion that public policy and funding for national and state broadband initiatives should leverage public/private partnerships to successfully accomplish the ambitious goals set forth through the National Broadband Plan. Just as ARE-ON has done in addressing the broadband needs of its higher education members through its partnerships with commercial cable providers, we encourage use of similar partnerships to provide capital and incentives for expansion of broadband into the rural areas of the state, to use fiber swaps and peering arrangements to exchange facilities and network traffic between public and private entities, and to leverage the strengths of commercial providers for middle-mile and last-mile connections.

Today, ARE-ON's member universities and colleges enjoy a level of service previously not available to them. ARE-ON continues to look for innovative ways to expand its ability to provide scalable, reliable, and secure broadband services to its members and to leverage its infrastructure to benefit all citizens of the State of Arkansas.

### Conclusion

It has been my honor to provide testimony on our efforts for the members of the Arkansas Research and Education Optical Network. Thank you for the invitation and opportunity to speak on this very important issue, and I would be happy to answer any questions.