



## 1st-Mile Institute

The **New Mexico Broadband Report** has been prepared to provide a 2011 ‘snapshot’ update on broadband initiatives, economics and developments in this state.

The report is not all-inclusive, and does not go into detail on any noted projects, but it does recommend development and continued updates to the 2008 “New Mexico Integrated Strategic Broadband Initiative” (NM-ISBI) plan, which is to be inclusive and detailed, serving to improve and coordinate statewide broadband related decision-making and economically vitalizing actions.

Achieving more equitable, life and livelihood improving ‘broadband for all’ in New Mexico, will require dedicated commitment, improved understandings, greater coordination, state and local leadership, public-private cooperation, aggregation of rural demand and new business models.

The Report makes general recommendations, which cumulatively can help to achieve ‘greatest bang for limited bucks’ on the ground, while having potential to result in New Mexico rising in U.S. state broadband rankings, from current 47<sup>th</sup> place, to being in the top ten within few years.

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The 1st-Mile Institute is a ‘think and do tank’, established to provide broadband networked society research, education and demonstration project services, with a dedicated focus on economic quality-of-life enhancing networking initiatives for the State, the communities and the people of New Mexico. 1st-Mile Institute is a program of 501(c)(3) nonprofit Santa Fe Complex.

1st-Mile Institute has since 2006, hosted New Mexico’s dedicated broadband information resource web site and email list:

List subscription and archive link are at: [www2.dcn.org/mailman/listinfo/1st-mile-nm](http://www2.dcn.org/mailman/listinfo/1st-mile-nm)

The Institute is an NTIA-BTOP Sustainable Broadband Adoption awarded grant partner on the State Library’s “Fast Forward New Mexico” project, and is to be contracted to organize the “Fast Forward NM Broadband Conference” for 2012.

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*People and communities generating networked eco-social value locally, are the first mile, not the last mile.*

## **1st-Mile Institute**

# **New Mexico Broadband Report**

September 1, 2011 (Updated Nov. 25, 2011)

### **The State of the State**

New Mexico is variably ranked about 47<sup>th</sup> among the 50 states, for rate of broadband provision, access and adoption. It would not be far-fetched to say that not just the rural, the poor and under-educated are underserved, but that State and local government, schools, libraries, small and large businesses, and most communities in New Mexico are on the wrong side of the ‘digital divide’.

It is increasingly understood that energy and telecommunications are fundamental drivers of our 21st Century economy. The State of New Mexico has many difficult challenges before it, but it has the resources, the social capital and the opportunity to help itself and its people, while setting needed example for the nation. Clear, phased, long-range commitments are required.

### **NM Integrated Strategic Broadband Initiative**

In Summer 2008, the Governor’s Office, through the NM Computing Applications Center (NM CAC), contracted with Design Nine, Inc. to rapidly prepare a ‘roadmap’ plan/report for a recommended New Mexico “Integrated Strategic Broadband Initiative” (NM-ISBI).

Soon after the report’s submission in Sept. 2008, implementation steps were taken by NM DoIT Cabinet Secretary Marlin Mackey, and by the Governor’s Science Advisor, Dr. Thomas Bowles (NMCAC CEO). The report made it clear that well coordinated public and private sector initiatives could result in substantial win-win economic cost savings as well as gains for both sectors, enabling significant upgrades to statewide broadband network infrastructure, spurring new services and business innovations, improving education and healthcare, and economically revitalizing communities. The NM-ISBI also provided a needed foundation upon which to build a coordinated and successful approach for statewide Broadband Stimulus proposals.

### **ARRA Broadband Stimulus in NM**

From early March through the mid-August 2009 first round submission deadline, weekly Friday morning working meetings were held at the State Library in Santa Fe, with substantial (200+) in-person and statewide phone-conference participation. This process resulted in the USDA-RUS, NTIA-BTOP and FCC holding their July 2009 regional public workshop in Albuquerque.

The RUS and NTIA subsequently provided two rounds of 2009-2010 funding for fiber and wireless infrastructure deployments, as well as for ‘public computing centers’ and ‘sustainable broadband adoption’ programs. Competitive, equitable and affordable broadband provision in underserved rural areas was a federal funding priority.

## **ARRA Broadband Stimulus Awards**

At the end of September 2010, the federal government concluded the awarding of broadband stimulus funds, a \$7.2 billion portion of the Obama Administration's \$787 billion total American Recovery and Reinvestment Act (ARRA) allocation.

New Mexico fared relatively well in this process that was programmed through the USDA RUS Broadband Infrastructure Program (BIP: grant/loan combinations), and Commerce Department's NTIA Broadband Technology Opportunity Program (BTOP: grants for infrastructure, public computing centers and sustainable broadband adoption).

In total, New Mexico entities (telecom providers, state government, institutions, libraries, tribes, public housing, energy coops and regional community initiatives) have been awarded a total of \$180.3 million (approx. \$12 million of which was rescinded). Some New Mexico communities will also benefit from local participation in the funded efforts of national or multi-state awardees.

All stimulus grant and loan recipients will invest additional matching funds and loan repayments, resulting in at least \$400 million being spent for in-state broadband related projects over the next couple of years, with many ongoing and new jobs and economic opportunities being created.

The New Mexico Governor's Office expressed its recommended support for stimulus project applications which participated in or were being developed in accord with the State's "Integrated Strategic Broadband Initiative"; its main objective being that coordination of all statewide local and regional, public and private sector projects, could lead to greatest bang-for-buck results and benefiting social outcomes.

## **Infrastructure**

ARRA stimulus funds are now supporting a number of broadband infrastructure projects in New Mexico. ENMR/Plateau, Baca Valley Telephone, Penasco Valley Telephone, Windstream Communications, US Cable, La Jicarita Electric Coop, Kit Carson Electric Coop, San Ildefonso Pueblo, Navajo Tribal Utility Authority (NTUA) and the NCNM REDI Net intend to upgrade systems and to extend middle-mile fiber infrastructure, as well as to reach customers with enhanced fiber, DSL and wireless deployments in their geographically dispersed service areas. Technical, geographic and social aspects of these projects vary widely, but should result in better access and jobs, while additionally stimulating the economies of the communities to be served.

For example, construction on ENMR/Plateau's statewide fiber deployment is estimated to now be over 60% complete. The first phase core fiber network is currently being turned up for testing and service, and should be completed by the end of this year. Plateau is meeting with anchor institutions throughout the network's service area, to provide project updates and to discuss new services that can be offered. Phase two bids are now being reviewed, with construction expected to start shortly. All work must be completed by July 31, 2013. In addition to ENMR/Plateau staff, its engineering and construction contractors are creating (25+) jobs, with more jobs to be created as connectivity and service to anchor institutions gets under way.

‘Open’ broadband networks, being deployed by the NTUA, Kit Carson Electric Coop and the REDI Net, involve public sector investment in and ownership of infrastructure, to be leased to competitive private sector services and content providers, generating private and public sector income, ideally offering subscribers greater choice of providers, services and reduced pricing.

### **Spotlight on North Central NM Interconnecting Broadband Projects**

In north central New Mexico, an increasing number of government organizations, communities, pueblos, public institutions and companies are partnering on an integrated open fiber network extending from Taos, Colfax and Rio Arriba to Los Alamos and northern Santa Fe counties, led by broadband stimulus funded Kit Carson Electric Coop, Northern New Mexico Council of Governments’ REDI Net, and San Ildefonso’s Tewa Broadband (wireless).

REDI Net partners include the Pueblos of Ohkay Owingeh, Santa Clara, Tesuque, Pojoaque and San Ildefonso; the counties of Los Alamos, Rio Arriba and Santa Fe; and the City of Espanola. Initial active first-mile service-provider partners include Tewa Broadband, Agavue, Kit Carson Telecom and ENMR/Plateau, with more expected to join.

Area rural electric cooperatives will help operate and maintain the the REDI Net, with Jemez Mountains Electric Cooperative providing outside plant maintenance, and Kit Carson Electric Cooperative managing the network, which will offer wholesale bandwidth to ISPs.

Kit Carson Electric Cooperative (KCEC), with central facilities in Taos, is deploying fiber on poles to serve anchor institutions, homes and businesses in 29 communities, including Taos and Picuris Pueblos. KCEC is setting national example for its efforts to integrate broadband and ‘smart energy grid’ infrastructure, systems and business strategies.

Tewa Broadband, connecting to the open fiber network, is providing wireless Internet service to over 2400 households in the 1000 square mile upper Rio Grande Valley, including San Ildefonso Pueblo, El Rancho, Jaconita and Jacona, to the El Rito Highway.

Los Alamos County is currently contracting for local extension of its municipal fiber network, which will connect to the REDI Net. County and City of Santa Fe are planning to deploy a community extended southern section (e-Cequia) of the regional open fiber network, as well.

The State Department of Information Technology (NM DoIT) received a critically important and substantial NTIA infrastructure grant to upgrade deployment of the statewide public safety and emergency communications network, which is now under way.

These projects, while extending and enhancing broadband access and service capabilities, will also address pricing, affordability and competitive interconnectivity issues, while providing enhanced connectivity to numerous identified ‘community anchor institutions’, including government facilities, libraries, K-12 schools, colleges, tribal, healthcare and public safety sites.

## **Access, Adoption and Capacity Building**

New Mexico applicants also received NTIA BTOP awards to help narrow the digital divide. The State Library and partners (UNM Extended Ed., Global Center for Cultural Entrepreneurship and 1st-Mile Institute) received a Sustainable Broadband Adoption (SBA) grant. Their “Fast Forward New Mexico” initiative will provide laptop training computers and a rich complement of education and public skills-development programs, at (17+) selected libraries throughout the state during a two year schedule.

Santa Fe Public Housing Authority received a Public Computing Centers (PCC) award to establish a computer lab with training programs for its residents and neighbors. Additional NTIA SBA and PCC awards to multi-state organizational initiatives, will benefit New Mexico partner sites, including the Boys and Girls Clubs of Santa Fe, public housing centers in Anthony, underserved Hispanic communities in Albuquerque, and will provide nationwide enhanced online services for the deaf.

If these public access, education and adoption programs successfully lead to increased numbers of broadband subscribers, support from benefitting ISPs may be a means for continuation of programs. These programs can go a long way to help bridge the very difficult economically and socially undermining digital disparities still impacting our rural and urban communities.

*According to the Akamai “State of the Internet” Report of Jan. 25, 2011, prior quarterly increases in high broadband adoption of 10% or more were seen in 23 states and the District of Columbia, with New Mexico topping the list at 60% growth. This refers to is the comparison of New Mexico's 3rd quarter rate (21%) to the second quarter (13%), at speeds over 5 Mbps. This included 578,764 unique IP addresses that were geo-located to New Mexico.*

## **NM DoIT Broadband Mapping and Planning**

In 2010, along with all other states and some territories, the NM DoIT was awarded \$1.4 million in NTIA States Broadband Data and Development Program (SBDDP) funding for a two year project to gather and analyze data, and map broadband in New Mexico, with an additional \$500,000 for five years of statewide broadband planning. Early in 2011 the NM DoIT received \$2.9 million in supplemental funds to extend ‘mapping and planning’ work through end of 2014, with additional support for specified ‘capacity-building’ and ‘technical assistance’ programs.

By integrating comprehensive broadband data gathering, analysis and verification, GIS mapping, web site development, regional planning efforts, technical assistance, capacity-building projects and public outreach (including workshops and conferences), the new State Broadband Initiative (SBI) can go far to improve coordination and decision-making among all broadband providers and stimulus awardees, state institutions, tribes, communities, as well as with the NTIA, RUS and FCC. Included in the SBI is funding to continue to regularly update and make the “NM-ISBI” an online ‘living document and process’.

*The table at the end of this report lists of all New Mexico broadband stimulus awards.*

## **FCC National Broadband Plan and NM**

On March 16<sup>th</sup>, 2010, the FCC presented its “National Broadband Plan” (NBP) to Congress. The Plan and following political processes is resulting in some actions to date, and many yet uncertain and contentious policy outcomes. The NBP will have implications for the State, and for telecommunications companies, communities, tribes and others. It has bearing on pole-line attachment and right-of-way issues. It promotes more coordinated integration of smart energy grid and broadband deployments. It will make available added spectrum for public safety and emergency wireless communications. It will restructure the Universal Service Fund to subsidize E-Rate, plus broadband accessibility and affordability for those most in need. Changes in the national broadband environment will also need to be understood, incorporated and leveraged in State and local initiatives.

Many low-income rural and urban families in NM will soon benefit by qualifying for reduced rate (\$9.99) broadband service from providers cooperating with the FCC in addressing the ‘digital divide’. CenturyLink and Comcast have already signed on.

New Mexico tribal communities will hopefully benefit from the FCC’s recently established Office of Tribal Affairs and Policy, and from the Native Nations Broadband Task Force, which now includes representatives of our Pueblos and of Navajo Nation.

## **USDA RUS Awards**

In addition to ‘stimulus’ funding, the Department of Agriculture’s Rural Utilities Service (RUS) programs make low-interest loans and grants throughout the year. Recipients of RUS loans, and of their Community Connect, Distance Learning and Telemedicine awards in New Mexico since late 2009 include: Agavue, LLC; Tularosa Basin Telephone Coop; Leaco; Western NM University; Regional Education Coop #9; Nizhoni Smiles, Inc.; and Roosevelt County Telephone Cooperative, Inc. for a combined total of over \$82 million in projects funding.

## **CenturyLink**

The merger of Qwest Communications and CenturyLink was formalized in Spring 2011, with all Qwest service areas in 14 states now doing business as CenturyLink. CenturyLink stated that it would make good on the commitments made by New Mexico Qwest in the Alternative Form of Regulation (AFOR) approved by the Public Regulation Commission (PRC) in late 2009, including expansion of broadband services to 75 percent of the rural areas in its service territory.

CenturyLink recently announced that it completed ahead of schedule the \$258 million capital investment, as ordered by the New Mexico PRC under the 2007 Second Amended Settlement Agreement (SASA), with \$3 million above the \$255 million investment required per the SASA. It also announced plans to invest at least \$20 million to improve and expand broadband communications and increase connectivity speeds to consumers in New Mexico.

## **There's More**

There are many more large and small carriers, cable companies, telcos, rural coops, ISPs, tribal and municipal networks throughout the state, working without stimulus funds or grants. It is not an easy time for them in the currently evolving broadband business and economic climate, but there are 'shining lights'. Sacred Wind Communications is a trusted provider and partner for Navajo communities, many without water or electricity. The City of Farmington is about to extend its fiber network and services within the city and east to Bloomfield and Aztec, and west to Kirtland. Los Alamos County is currently also extending its fiber network. There are many (wireless) WISPs providing the only service in some rural areas, and much needed competition in many other areas of the state. And in Albuquerque, CityLink Fiber, Inc. is setting national example with its affordable, open access, gigabit fiber to the premises network and services.

NMCAC's "Encanto" supercomputer and statewide Gateway network, now has at least 27 higher education institutions initially connected, and NM EPSCoR has received NSF funding to extend CyberInfrastructure to Northern NM College, Western NMU (Silver City) and Navajo Technical College (to Zuni Pueblo). More support for enhanced education/research networking is needed.

## **Content and Applications**

It is unfortunate that our broadband enabled future is so caught up with the contentious issues of who owns and controls broadband networks and services, when what really matters is how we use these network capabilities to improve our lives and livelihoods. The Internet is a convergent network of networks, which should be planned and deployed to augment and serve all sectors of society. Fiber and wireless broadband networks (copper is to be phased out over time) are the means of transport for a wealth of networked applications, services and aggregated content, which will foster a next wave of innovations and of ever more broadband networked economies.

Though New Mexico was awarded FCC tele-health network funding four years ago, and there are some current beginnings, little has yet been implemented. The State Legislature and IDEAL NM are supportive of broadband networked schools and distance learning, especially in our most rural communities, yet many schools remain under-served. And, the State of New Mexico has been ranked near last among all states for online e-government applications and usability.

New Mexico should be proactive in fostering new 'digital media' industries throughout the state, building on the foundation successfully established for film and television production and support. Along with a next-generation, digital media higher education initiative, this sector can result in longer term and more geographically distributed opportunities for economic vitalization than any, other than the energy sector. Digital media distribution requires broadband networks, and is the primary driver of the broadband economy.

Most critically, our broadband networks should be built in coordination with new 'smart grid' energy infrastructure, 'intelligent transportation', public works and water infrastructure improvements. We cannot afford separate, redundant construction projects. Integrated planning and construction will save us millions of dollars annually. We must try to only 'dig once'.

## **Economics and Jobs**

While broadband and digital media growth opportunities are clearly a key to economic development and innovation, civic participation, science and technology R&D, and cultural entrepreneurship, there is need for state leadership and advocacy to make this a reality. Broadband development is not included in the State's "Invest New Mexico" plan. A July 2011 Bureau of Labor Statistics report shows that New Mexico was a big loser of jobs, down 14,400 jobs in professional and business services in the last five years, a 13.4 percent drop.

*"The Internet accounts for 21 percent of GDP growth over the last five years in mature countries and 2.6 new jobs for every one job lost."*  
(McKinsey Global Institute, May 2011)

## **New Mexico Broadband 2011-2015**

Data used to assess the number of households unserved by broadband in New Mexico varies widely, depending on source. It is however clear, that Catron, Hidalgo and Mora Counties have been poorly served to date. NTIA SBDD Census Tract Data (June 2010, 3 Mbps/768 kbps Fixed Broadband Data) notes 146,568 unserved households, whereas telco provided FCC Form 477 Census Tract Data for the same time, indicates 50,675 unserved households. NM DoIT's NTIA funded 'Broadband Mapping' project will provide most accurate surveying, data, analysis and projections, for improved decision-making and action steps over the coming years.

Between now and 2013, most stimulus awardees will be actively creating jobs, deploying conduit and fiber infrastructure, erecting towers, providing public education and training, upgrading network equipment and offering new voice, video and Internet services to many more people. The State should be an active partner and coordinating body for these many disparate efforts, to assure greatest success in the outcomes for all, in a timely, transparent and least wasteful manner. State government can be a big winner, without need for any added spending.

State government is the largest single customer for broadband services in the state. In 2010, NM DoIT began working to aggregate services for its 2000+ circuits in over 138 New Mexico communities, in order to leverage greater bandwidth provision and reduced rates from incumbent and competitive telecom providers. Rural market aggregation, increased bandwidth and reduced pricing strategies must be applied not just to State government, but to all institutions, small businesses and residents across the state, in order to make new business models work for all.

An aggregated total of approximately \$4 billion is spent annually by New Mexico residents, businesses and institutions for telecom services (phone, cable, mobile, satellite and Internet), with most of that amount leaving the state. If one percent (1%) of that total were reallocated annually for broadband infrastructure, access and service upgrades, it would be possible to cost-effectively achieve stated objectives of 'broadband for all', within five to seven years.

If New Mexico takes a dedicated course of advocacy and action to meet practical in-state needs, while setting on-the-ground example for the nation, it can easily rise from 47<sup>th</sup> place ranking, to be among the top ten broadband leading states. In so doing, it can significantly vitalize State and local economies and stimulate the creation of socially and culturally strengthening opportunities.



<b>New Mexico: USDA-RUS-BIP + USDoC-NTIA-BTOP ‘Broadband Stimulus’ Awards</b>		
<b>Round 1 Awards</b>		
• State Of NM DoIT	\$ 1.9 million + \$ 2.9 m. Round 2	NTIA SBDDP
• NM State Library	\$ 1.5 million	NTIA SBA
• Santa Fe Civic Housing Auth.	\$ .2 million	NTIA PCC
• ENMR/Plateau	\$11.3 million	NTIA Infrast.
• Baca Valley Telephone	\$ 3.3 million	RUS BIP
• Penasco Valley Telecom Co.	\$ 9.6 million	RUS BIP
• San Ildefonso Pueblo	\$ 1.2 million	RUS BIP
• <i>Western Telephone</i>	<i>\$11.5 million (rescinded)</i>	<i>RUS BIP</i>
• Navajo Tribal Utility Authority	\$32.2 million (UT-AZ-NM)	NTIA Infrast.
• Mission Econ. Dev’t Agency (Anthony, NM)	\$ 3.7 m. (nationwide)	NTIA PCC
• One Economy Corp. (Albuquerque, NM)	\$28.5 m. (nationwide) (\$ 458,225 in NM)	NTIA SBA
• Communication Service for the Deaf	\$15.0 million (nationwide)	NTIA SBA
• University Corp. for Advanced Internet Dev’t	\$62.5 million (nationwide)	NTIA Infrast.
<b>Round 2 Awards</b>		
• NM DoIT	\$38.7 million	NTIA CCI
• ENMR	\$16.5 million	NTIA CCI
• NCNMEDD - REDI Net	\$10.5 million	NTIA CCI
• Kit Carson Electric Coop	\$63.7 million	RUS BIP
• <i>Dell Telephone Coop</i>	<i>\$ .4 million (rescinded)</i>	<i>RUS BIP</i>
• Windstream Communications	\$ 2.3 million	RUS BIP
• La Jicarita Electric Coop	\$11.8 million	RUS BIP
• US Cable	\$ 4.5 million	RUS BIP
• Zero Divide (Santa Fe Boys & Girls Clubs)	\$ 1.4 million (6 states)	NTIA SBA
• Hughes Network Systems	\$58.8 million (nationwide)	RUS BIP
• Wildblue Communications	\$19.5 million (west/mid-west)	RUS BIP
NM was awarded \$29.0 M. + part of \$141.9 M. in Round One, and \$151.3 M. + part of \$79.7 M. in Round Two.		
NM Total Broadband Stimulus loan and grant funds awarded to date: \$180.3 M. + a small portion of \$221.6 M.		
NM awardees provided over \$200 million in matching funds to augment total project investments.		



*REDI Net fiber deployment near Tesuque Pueblo, Aug. 22, 2011*

### **Richard Lowenberg**

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1st-Mile Institute is a sub-grantee on the State Library’s NTIA Sustainable Broadband Adoption award, to host a “Fast Forward New Mexico” Broadband Conference in 2012. The 1st-Mile email list, with 300+ subscribers, is New Mexico’s only online broadband information resource.

Senior Broadband Planner, **Design Nine, Inc.** [www.designnine.com](http://www.designnine.com)  
Design Nine was contracted by State of New Mexico from 2008-10, to prepare the New Mexico “Integrated Strategic Broadband Initiative” (NM-ISBI) plan, and to help steward a successfully coordinated statewide ‘broadband stimulus’ applications process. Design Nine works nationally.

Richard has directed rural, state and international Internetworking initiatives since the late 1970s. He served on the National Research Council committee making recommendations on next phase local broadband development, publishing “Broadband: Bringing Home the Bits” in 2002.

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