CONNECTING NJ

New Jersey's State Broadband Initiative

Overview and Benefits

NJOIT

New Jersey Office of Information Technology

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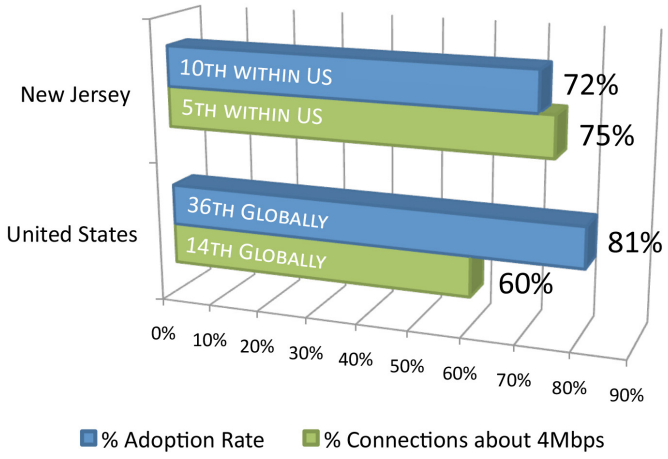
Executive Summary

Broadband has become a significant enabler to economic growth, global competitiveness and job creation. It is an essential tool for today's digital age that is quickly unleashing the power of our global communications and computing platform and providing significant growth opportunities in education, healthcare, public safety, government and economic development.

In 2010, the Federal Communications Commission (FCC) unveiled a National Broadband Plan (NBP) that details how an investment in broadband today will position the United States to lead globally. Specifically, the NBP is a roadmap for ensuring that all Americans benefit from broadband by improving access, speed and adoption of the technology across all sectors of the population, businesses and Community Anchor Institutions (CAI).

Currently the United States lags behind many countries in speed and adoption of broadband technologies. According to the Akamai Internet Connectivity Report for the first quarter of 2012:



The FCC categorizes an Internet service as "broadband" if it transmits at a speed of at least 4 megabits per second (Mbps). However, the minimum speed for broadband continues to increase and higher speed requirements continue to change as the internet and new technologies continue to evolve. In fact, many countries have longer-term connection speed targets in the tens or hundreds of Mbps, and are providing tiers above 10 Mbps at affordable rates for most subscribers.

New Jersey was awarded $4,926,106 ARRA (American Recovery & Reinvestment Act of 2009) federal funds from the Department of Commerce's National Telecommunications and Information Administration (NTIA) in February 2010 under the State Broadband Initiative (SBI) to develop a State Broadband map and to build awareness with community anchor institutions in ways that will help facilitate the integration of broadband into state and local economies.

The New Jersey SBI Program, ***ConnectingNJ***, was funded under two projects which originally included data collection and verification activities, and was amended to also include capacity building and technical assistance, as part of a second phase that recently began in July of 2012.

The mission of the program is to gain better insight of broadband availability, adoption and broadband usage in the State, and identify how broadband can help bring more growth opportunities, improved services and better outcomes for community anchor institutions and the State's overall economic growth.

The key objectives of the overall program are to:

- Collect data from service providers on coverage and speed across the State to build the State Broadband Map
- Increase awareness of the State Broadband Map and how different sectors and businesses can best leverage its value
- Build awareness on broadband benefits with four initial target sectors: namely, workforce development, education, small business and healthcare
- Determine adoption rate and barriers at the household level
- Provide educational and informational resources to raise awareness of broadband benefits to small businesses and ways they can effectively use broadband for business growth opportunities.

As a next step, OIT is forming a Broadband Advisory Cooperative with the primary objectives of the team to provide a vehicle for fostering communication between stakeholders to share insight and collaborate on ways to increase broadband adoption and use of broadband technology.

This requires the participation and engagement of various stakeholders to further stimulate and encourage expanding broadband demand and utilization especially among underserved communities where the need for affordable, simple and direct online access to services and programs is most lacking. This will require developing working relationships with key stakeholder groups in targeted areas including workforce development, education, economic development, and health care communities.

"The State Broadband Initiative in New Jersey could have a substantial impact on workforce development, education, small business growth and health care through the increased awareness and adoption of broadband capabilities. New Jersey's program, ***ConnectingNJ***, will provide the platform from which digital demands can be met to support workforce development, increase educational opportunities, and enable businesses, and improve health care delivery to more effectively compete through the increased broadband adoption rate."

- Gloria J. Broeker, Chief Operating Officer, New Jersey Office of Information Technology

The State Broadband Initiative – Connecting NJ

NTIA's State Broadband Initiative (SBI) implements the joint purposes of the Recovery Act and the Broadband Data Improvement Act, which envisioned a comprehensive program, led by state entities or non-profit organizations working at their direction, to facilitate the integration of broadband and information technology into state and local economies. Since the program's inception, NTIA has awarded a total of $293 million to 56 grantees, one each from the 50 states, 5 territories, and the District of Columbia, or their designees. New Jersey Office of Information Technology (NJOIT) was funded 4.2 million dollars for five years of state-led efforts to collect data semiannually on the availability, speed, and location of broadband services across the state.

The first phase of the New Jersey SBI program, ConnectingNJ, included a data collection and mapping effort to build a state broadband map showing availability and speed of broadband access in the State to gain a better understanding of broadband utilization versus capacity. With the award for this data mapping phase, the State has the means to capture where broadband is available and most importantly determine its utilization (current demand) capacity and future demand for broadband statewide. OIT has been working with the selected vendor and broadband service providers and community anchor institutions (CAI's), including education institutions, libraries, healthcare providers, government and other non-government organizations to collect, validate, verify data on broadband services available throughout the state.

The second phase, which began in July 2012, consists of two projects, capacity building and technical assistance, that will focus on raising awareness of the broadband map and how broadband can be leveraged in the community anchor institutions to benefit its constituents.

OIT has recently established the SBI Program Office to administer the next phase of the program, and to facilitate the development and execution of this outreach effort. The primary objective of the outreach effort is to initially work with four target sectors: Workforce development, Education, Economic Development and Healthcare, to bring heightened attention to the various benefits that broadband can bring to the respective community anchor institutions and to gain further insight on the adoption rate, current use and adoption barriers within their constituency groups.

To meet these objectives, the next step requires the support of stakeholders from each of the target sector communities through outreach efforts to their constituents to create the awareness of the goals and benefits of the New Jersey State Broadband Initiative,

Broadband Availability/Speed in New Jersey

Today, New Jersey has 92% Broadband coverage from wireless and wire line technologies. The 8% of non-broadband coverage relate to areas of the Highlands, and portions of Northwest and Southwest New Jersey. However, if satellite technology is factored into the options, NJ is nearly 100% covered. Currently "coverage" based on the FCC minimum standard of 4mbps is not as much the issue in NJ as in other states. The focus will be on increasing awareness of broadband usage and adoption and in supporting key target sectors in workforce development, education, economic development and healthcare, to educate their constituents on how they can best use broadband to reap those benefits.

While we have the minimum speed coverage now in the State, the minimum speed for broadband continues to increase and higher speed requirements continue to change as the internet and new technologies continue to evolve.

What is Broadband?

The term "broadband" refers to a transmission medium that enables high speed Internet access through a connection service that is always on. The technology behind the transmission includes: DSL, Cable Modem, Fiber Optics, Wireless, Satellite, WiMax, and White Space, all of which are faster than dial-up access.

The FCC, who categorizes broadband into various service tiers based on these speeds defined basic broadband service as data transmission speeds of at least 4 megabits per second in the download direction, and 1 megabit per second in the upload direction.

Different factors and the various types of technology determine the speed and quality of your connection and more importantly, how quickly you can access information, download files, or receive e-mails.

Everyone has experienced delays waiting for something to load, long waiting time for downloads, skips and interruptions - all of which simply mean the connection cannot handle the speed at which the transmission is being delivered to the computer screen.

Depending on which is being used, the speed of the connection will often determine whether it is even possible to run the application seamlessly. Therefore, to perform specific tasks, or to use certain programs, your Internet connection must run at certain speed requirements.

The following is the current speed requirement of applications that service different sectors:

768K-1.5 Mbps	Email, Web Browsing, VOIP
1.5-3 Mbps	Telecommuting, Streaming Music and Video, Remote Surveillance
3-6 Mbps	File Sharing, Internet Protocol Television
6-10 Mbps	On-Demand Video, Gaming
10-25 Mbps	Telemedicine, Remote Education, IPTV High Definition
25-50 Mbps	HD Video Surveillance
50-100 Mbps	Video Conferencing, Remote Super Computing
>100 Mbps	Real-Time Data Collection, Real-Time Medical Image Consultation

National Broadband Plan Requirements and Goals for Speed - The FCC definition of broadband was initially 200 kbps, but was increased to 4 Mbps download and 1 Mbps as the standard is for a minimum broadband connection. As part of the National Broadband Plan, the FCC laid out an ambitious goal with respect to broadband speed, to make 100 Mbps broadband available to 100 million people by 2020.

As speed requirements continue to evolve with the Internet and the continuously evolving technologies, the State Broadband Map can be a great tool to identify the speeds available by different service providers on an ongoing basis to help determine where there may be unmet needs in the State.

The New Jersey State Broadband Map

To begin realizing the benefits of the initial phase of data collection, NJ OIT created a Broadband Map with data from 30 Broadband providers and approximately 15,000 community anchor institutions, including educational institutions, libraries, healthcare, state and local government within the State.

The purpose of the Broadband Map is to support efforts to expand broadband access and provide businesses and consumers with the relevant information they need to make decisions related to their high speed internet options.

NJOIT and its vendors have been working with facilities-based providers of broadband services, as well as resellers, local government organizations and community anchor institutions, to collect, validate, verify and deliver certain data on broadband services available to end user locations in the state.

The data being gathered provides information on:

- Where broadband service is available
- The technology used to provide the service
- Names of providers and the areas they service
- Maximum advertised speeds of the service they provide
- Locations and speeds of community anchor institutions.

The State of New Jersey's Broadband Map was developed with the funding from the State Broadband Initiative and is refreshed and updated every six months and can be found at http://connectingnj.state.nj.us

With a comprehensive and continually updated map, the State can continue building the value of the New Jersey Broadband Map, so it can be used as an effective tool for state policy makers, businesses and citizens to:

- Identify pockets of unmet demand or need
- Help policy makers identify where the unmet needs are so they can determine how best to fulfill them
- Use the map as a tool to market NJ and support decisions for businesses looking to relocate
- Identify where existing technology infrastructures can be leveraged
- Help providers and customers find each other

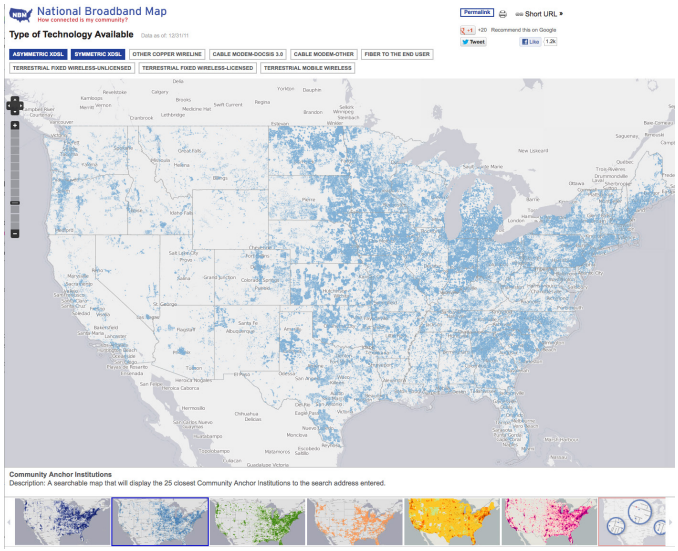
To-date, most service providers have been responsive. However, collecting data on community anchor institutions has been a challenge due to the lack of existing broadband data sources and a lack of participation to provide the data. As additional information and data is provided, the New Jersey Broadband map will become more dynamic and interactive.

Below is the current snapshot of CAI data collected to date.

CAI Data Summary (as of 9/25/12) CAI Category	Total # of Locations Identified	Total # of Records with Broadband Data
School K-12	3762	2465
Libraries	460	43
Medical/Healthcare	8604	5
Public Safety	337	76
University	159	34
Other – State and Local Government	0	1694
Other – Non Government	0	8

As part of the NJ six-month data submission cycle, the data is also being submitted to the NTIA for updates to the National Broadband Map. Below are examples of how businesses and state entities have utilized the National Broadband Map to make economic decisions.

How Other States and Groups Have Gained Value from the Broadband Map



Utah, a mid-sized company in the health care field was losing time and money due to frequent broadband outages at a rural office. The company considered moving these jobs to their headquarters in an urban location. However the company was able to use the National Broadband Map to identify other broadband providers in this rural county – and retain hundreds of jobs in this rural area.

Kansas - The Kansas Department of Commerce and a customer service company used the map to identify communities with the broadband necessary to support home-based workers. As a result, the customer service company hired about 200 workers in the state, providing much-needed jobs in small towns that may have otherwise been overlooked for this work.

South Dakota - An online training company used the map to identify towns in South Dakota where they can locate new offices, which will support more than 100 professional jobs in these rural locations.

Academic Research - The map has supported academic research at more than 1,000 colleges and universities and been used by more than 500 city and county governments.

How to Take the New Jersey Broadband Map to the Next Level

Stakeholder representatives need to encourage their constituents to participate in submitting data related to their location and broadband use. Representatives supporting these community anchor institutions need to build further awareness on the purpose and value of the map and encourage their constituencies to participate.

This last data submission cycle, the Department of Education provided OIT a full set of K-12 school Broadband data that they collected as part of their own initiative, which was used to enhance the quality of the education data. We've also received data that Healthcare has available for their Health Information Technology (HIT) map which increased the number of locations of healthcare providers on the map. We are seeking similar data sharing efforts from the other CAIs to continue to enhance the quality of the map.

For more information on providing such data or to encourage constituents to participate, contact us at connectingnj@oit.state.nj.us or visit our website at http://connectingnj.state.nj.us.

Broadband Adoption Benefit Analysis by Sector

Access and adoption to broadband removes geographical barriers and opens up opportunities to citizens and improves the delivery of services for labor and workforce development, education, economic development and healthcare. Today, high-speed Internet capability and access are essential for homes, schools, hospitals and workplaces.
In this phase of the project, we look to gain further insights into the following 4 target sectors that OIT has initially selected for the program:

- Labor and Workforce development
- Education
- Economic Development
- Healthcare

A description of the benefits is outlined for each sector with recommendations and ideas on ways adoption can be increased for each sector.

Labor & Workforce Development

As the economy continues to rebuild, broadband can deliver assistance and aid to help workers get back on their feet and excel in the modern workplace.

The benefits that broadband can help workers include:

- Providing access to online employment resources
- Opportunities for distance learning, online vocational training and resources to enhance their skill sets
- Remote working opportunities
- Solo entrepreneurship opportunities
- Ability to share ideas online through social media channels and video conferencing
- Self-marketing of talent

Using technology-based instruction for vocational training
reduces the cost by about a third, while also reducing time and increasing effectiveness of instruction.

Next-generation technologies are connecting employers with jobs across town and across the country. Telework is a pillar of the modern, digital economy. The FCC will work with other federal agencies to serve as a model institution for the private sector by aggressively implementing policies and technology that enable teleworking.

Recommendations for advancing broadband in Labor and Workforce:

- Build a new online national employment assistance platform to efficiently connect struggling workers with resources.
- Discuss ways to help eliminate tax and regulatory barriers to telework so workers can do their jobs from anywhere

Education

High speed Internet can enhance every level of education from kindergarten through high school to college to graduate school. Access to the internet has enabled education to no longer be confined to the classroom, and provides the platform to teach students in creative and affordable ways with tools that can allow students to learn the same course material in less time with smaller budgets.

Some of the broadband benefits that can be leveraged in Education include:

- Enhancing curricula at every grade level with dynamic interactive applications
- Providing access to resources from school libraries
- Enriching the delivery of education through real-time video exploration
- Enabling students access to online sharing and collaboration tools that allow them to collaborate and learn more effectively
- Preparing students entering the 21st Century workforce
- Building higher level skills and exposes students to creative uses of technology
- Allowing for remote collaboration and distance learning
- Enabling access to education specialists
- Expanding basic testing capabilities and supporting advanced placement in math and science
- Allowing the teachers to have a broader impact

Students on the losing side of the digital divide are being denied the powerful educational advantages possible with high speed Internet, while those in connected areas become accustomed to the digital world at an early age.

Students with little exposure to digital technologies translate to adults with limited career opportunities. Workers lacking technological versatility put the American workforce at a competitive disadvantage within the world economy. The earlier every student in America is connected to high speed Internet, the brighter the country's future will be.

Below is an example of how broadband was used to create benefit in the State of Oregon:

The State of Oregon has implemented one of those creative ways in using technology and broadband access to create cost savings. The Oregon experiment has the power to reshape the classroom experience. Students, for instance, will be able to access a range of documents from home; teachers will be able to provide feedback remotely; projects that once required hours in the library can be organized and executed using Google Aps. Oregon was the first state in the country to adopt Google Apps for all its school districts – a move that Google said will save Oregon, which is struggling to reconcile budget woes, upward of $1.5 million per year.

Recommendations in increasing adoption:

- Identify how technology and broadband access can cut costs and improve the education experience at the same time (learn from other States like Oregon)
- Identify available funding programs to support the build-up of infrastructure and technology needs that leverage broadband adoption.
- Aggregate schools in larger buying groups to share costs for acquiring and installing broadband networks.
- Identify community programs and available tools that facilitate the use of online applications and provide ideas and resources that enrich the delivery of education.

Economic Development (Small Business)

Broadband can provide significant benefits to the next generation of American entrepreneurs and small businesses—the engines of job creation and economic growth for the country.

Small and medium enterprises (SMEs)—businesses with fewer than 500 employees—employ more than half of America's private sector workers and create roughly 64% of net new private sector jobs each year.

However, many small businesses have a knowledge gap about how best to utilize broadband tools, leaving potential productivity gains unrealized.

The benefits of broadband for small businesses include:

- Increased market access ability to compete globally
- Increased sales and marketing effectiveness
- More efficient ways to service customers
- Reduced communications costs
- Reduced operational costs
- Increased speed of access to knowledge
- Increase opportunities for online businesses

Through private sector, options exist for training and educating small businesses, however those options are currently insufficient.

Recommendations for advancing broadband use for small business include:

- Integrate broadband assessment and planning into economic development efforts to understand needs and gaps for small businesses.
- Provide an online platform to educate and train small business on opportunities and resources for leveraging broadband.
- Support broadband choice and small businesses' use of broadband services and applications to drive job creation, growth and productivity gains.
- Leverage EDA and non-government associations to help small businesses achieve an optimum level of broadband use by building awareness of available resources, broadband tools and training to small business.

Healthcare

The expansion of broadband access and usage in healthcare can greatly increase the quality of service and can enhance patient care through the use of telemedicine, electronic prescriptions, electronic medical records and broader means of communication and sharing patient care responsibilities. It removes geographical barriers and allows people to receive the medical care they need when and where it's needed.

In the face of rising medical costs, increasing gaps in insurance coverage and the cost-cutting efficiencies of telemedicine, the delivery of quality health-related services and information using telecommunications technologies are more valuable than ever. Universal high speed Internet access would help bring the prospect of affordable and quality health care for all Americans closer to reality. Some examples include:

- Real-time transmission of medical imagery enables the interpretation of MRI, ultrasound, X-rays, and other diagnostic procedures to be performed remotely.
- Provides the ability to monitor remotely and provide online consultations to significantly reduce patient transfer
- Allows physicians to connect to distant and remote specialists for real-time guidance in emergency situations
- Allows for improved sharing of all patient electronic medical records to better coordinate care among multiple providers.

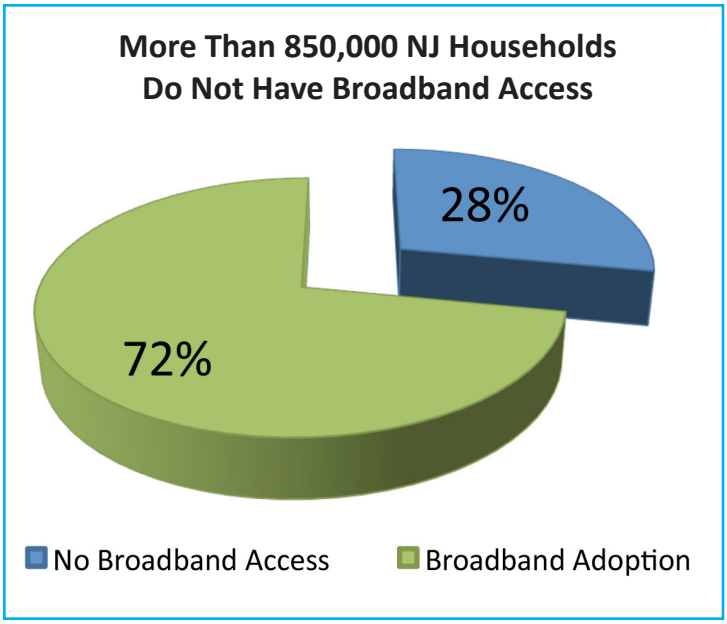
Recommendations for advancing broadband use for Healthcare include:

- Help ensure health care providers have access to affordable broadband networks (i.e Identify and recruit hospitals and physician practices to participate in future aggregation projects)
- Create incentives for adoption by expanding reimbursement for e-care.
- Remove barriers to e-care by modernizing regulations like device approval, credentialing, privileging and licensing.
- Drive innovative applications and advanced analytics by ensuring patients have control over their health data and ensuring interoperability of data.

Broadband Household Adoption in New Jersey

On behalf of OIT, Rutgers, The State University of New Jersey's **Bloustein Center for Survey Research** conducted a state-wide survey in 2010 to gain insight into broadband adoption and barriers to adoption at the household level. At the household level, the survey showed a 72% adoption rate in New Jersey and a non-adoption rate of 28%, meaning that more than 850,000 New Jersey households do not have broadband.

The top four reasons that were identified as the basis for non-adoption include:



1. **Lack of Inclination - 41.2%**
   Over 40% of non-adopters reported that the "main reason [they] don't use the internet or email" is either that they're "just not interested," "don't need it/ don't want it," "it's a waste of time," or they're "too busy/just don't have the time."

2. **Lack of resources - 30.4%**
   Almost one-third stated that it was either "it's too expensive," "don't have a computer," "don't have access," or assert that while they don't currently use it, they're "getting it."

3. **Lack of training or skill - 16.1%**
   Almost a fifth of non-adopters report that it is "too difficult/frustrating," they "just don't know how," or that they're "too old to learn" as their main reason for non- adoption. Only 24% to 28% of non-adopters report using a computer at any time on at least an occasional basis, or that they ever did so, or would like to do so in the future. Over half (53.5%) indicate they "would need someone to help" them with computers or technology to start using the Internet.

4. **Fear of Technology - 5.10%**
   A small percentage (53 respondents) report that the main reason for non-adoption is worry about "computer viruses," "spam" "spyware," "adware," "privacy," or that "it's an evil thing," or, simply, "religion."

The findings further indicated that there is a gap in awareness of the benefits and how broadband can be effectively used to contribute value at a personal level - with over 30% NOT associating any disadvantages with the key benefits that signify full inclusion in a digital economic society.

Poverty was found to be the most significant and consistent barrier to household-level broadband adoption, whether expressed as economic exclusion or lack of resources. However, even when poverty doesn't prevent access, it generally reduces the intensity and effectiveness of use of broadband.

Recommendations to Increase Household Adoption

The introductory work to-date has identified the following themes for further investigation:

- Raise awareness to the digital divide in NJ and the areas needing attention.
- Identify funding programs for the underprivileged.
- Developing educational programs that train individuals not only to be comfortable with Information and Communication Technologies (ICTs), but also in how and why to use the Internet should form an important part of any successful broadband adoption program.
- Many successful broadband adoption programs involve public / private partnerships and strong community involvement.

- Provide access and exposure to training programs and resources to use the internet for health, education, government and employment services.
- Involve public and private sector partnerships to promote adoption.
- Encourage efforts to provide grants and subsidies for equipment and access to broadband targeted at lower socio-economic areas.
- Provide hands-on exposure and training in Information Communication Technologies (ICT) for full and intensive use of broadband, focusing on access to information on jobs and workforce development.

These findings facilitate the understanding of what programs are most effective and cost efficient, to help determine what kinds of training programs and related initiatives would yield the highest return in terms of broadband adoption at the household level.

How You Can Help

As a next step, NJOIT is forming a Broadband Advisory Cooperative with the primary objective to provide a vehicle for fostering communication between stakeholders to share insight and collaborate on ways to increase broadband adoption and use of broadband technology.

The Broadband Advisory Cooperative will consist of representatives from the following agencies and institutions:

- Office of Information Technology (OIT)
- Economic Development Administration (EDA)
- Department of Education (DOE)
- Health Information Technology (HIT)
- Board of Public Utilities (BPU)
- K-12 Administrators
- Higher Education Institute
- Healthcare Association Official or Provider
- Small Business Association
- Labor and Workforce Development (LWD)

Below are the areas where we seek the team's help:

- Formalize the State's strategy and goals on broadband related to availability, speed, and adoption
- Encourage participation in improving the State's broadband map
- Help identify adoption needs, barriers and how to overcome them for each constituency group
- Help refine outreach / communication plan and messages to promote broadband
- Help define what technical assistance is needed
- Identify contacts from key target groups to promote awareness about ConnectingNJ, the State Broadband Initiative
- Promote and lead demand aggregation projects within the four target communities as a way to share costs and increase adoption related to cost barriers
- Assist to identify what needs to be done through policies and technology to encourage adoption
- Participate in Broadband Advisory Cooperative meetings

In addition, to the Broadband Advisory Cooperative, we are seeking representatives from the community anchor institutions to help bring awareness to their constituents on how they could gain benefits from broadband, and to find out what needs and barriers their constituents have in adopting and effectively using broadband. To learn more about getting involved, visit us at http://connectingnj.state.nj.us

Resources

1. The National Broadband Plan
   http://broadband.gov

2. The National Broadband Map
   http://www.broadbandmap.gov/

3. National Telecommunication & Information Administration Website
   http://www.ntia.gov

4. The Organization for Economic Co-operation and Development (OECD) broadband portal
   http://www.oecd.org/internet/interneteconomy/oecdbroadbandportal.htm

5. State Broadband Data and Development Website
   https://sbdd.pbworks.co/n/home

6. NTIA's Latest Broadband Adoption Report
   http://www.ntia.doc.gov/headlines/2011/ntia-releases-new-broadband-adoption-report

7. Official website of the Federal Communication Commission
   http://www.fcc.gov/

8. Broadband Submission Guidelines
   http://connectingnj.state.nj.us/

9. Akamai Report Q1-2012 - State of the Internet
   http://www.akamai.com/stateoftheinternet/

10. The State Broadband Website
    http://connectingnj.state.nj.us

11. The State Broadband Map
    http://njgin.state.nj.us/oit/gis/OIT_BroadbandMapping/

12. Google Apps to be a part of every classroom in Oregon
    http://www.csmonitor.com/Innovation/Horizons/2010/0428/Google-Apps-to-be-a-part-of-every-classroom-in-Oregon