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# *Education and Health*

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This Briefing Paper is compiled using excerpts from the 2010 Federal Communications Commission's National Broadband Plan (NBP)<sup>1</sup>, as well as the following sources:

- Mt. Hood Cable Commission's Community Technology Needs Ascertainment<sup>2</sup>
- IBM's: Smarter Education and Healthcare (links at end of each section)
- NTIA Educational Grants in Oregon<sup>3</sup>
- Cisco WebEx Case Study: Greater Baltimore Medical Center<sup>4</sup>
- Oregon Health Network (OHN) website<sup>5</sup>

Excerpted from chapter 11 of the National Broadband Plan, "Education"

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## *Background*

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The United States has some of the best schools and research universities in the world and produces top professionals in every industry. The public education system has effectively developed a workforce for the industrial age, and its graduates have helped the United States become the most prosperous nation in the world.

However, the demands of the new information-based economy require substantial changes to the existing system. American businesses have pointed to a widening gap between the skills of graduates and modern workforce demands. The U.S. Department of Labor predicts "occupations that usually require a postsecondary degree or award... to account for nearly half of all new jobs from 2008 to 2018."<sup>2</sup> The 21st century workplace requires both a better-educated and a differently educated work force.

- Broadband can be an important tool to help educators, parents and students meet major challenges in education.
- With broadband, students and teachers can expand instruction beyond the confines of the physical classroom and traditional school day.
- Broadband can also provide more customized learning opportunities for students to access high-quality, low-cost and personally relevant educational material.
- Broadband can improve the flow of educational information, allowing teachers, parents and organizations to make better decisions tied to each student's needs and abilities.

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<sup>1</sup> [www.broadband.gov/plan/](http://www.broadband.gov/plan/)

<sup>2</sup> [http://www.mhcr.org/docs/MHCRC\\_Communications\\_Technology\\_Needs\\_Ascert\\_Report%2804-21-10%29FINAL.pdf](http://www.mhcr.org/docs/MHCRC_Communications_Technology_Needs_Ascert_Report%2804-21-10%29FINAL.pdf)

<sup>3</sup> [NTIA Educational Grants in Oregon](http://www.ntia.gov/education/grants-in-oregon)

<sup>4</sup> <http://www.cisco.com/en/US/prod/ps10352/webexcase/GBMC.html>

<sup>5</sup> [www.oregonhealthnet.org/](http://www.oregonhealthnet.org/)

## Supporting and Promoting Online Learning

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Broadband breaks down traditional barriers so that teaching and learning happen in new ways.

Thanks in large part to the \$2.25 billion per year in support provided by the E-rate program, virtually every school in the country has Internet access.

Computer and Internet access alone do not produce greater student achievement.

- Access needs to be combined with appropriate online learning content, systems and teacher training and support.

There is strong evidence that online learning classes do not sacrifice quality of instruction for convenience and efficiency.

- Students at Oregon Connections Academy met or exceeded state achievement averages and students in the Florida Virtual Academy (unrelated to FLVS) have consistently outscored state test averages.
- Some school districts are finding that online systems can help with high dropout rates as well.
- Salem-Keizer School District in Oregon has re-enrolled more than 50% of dropouts and at-risk students through its online Bridge Program annually.

In addition to dropout prevention, online systems provide flexibility to students who cannot be in school for health, child-care, work or other reasons.

What policies or advocacy can your community pursue to encourage better digital content and course credit for on-line study?

Teachers also benefit from online professional learning communities, lesson development websites and certified professional development opportunities.

But there are still major barriers to realizing the full potential of online learning:

- There is a limited pool of high-quality digital content that is easily found, bought, accessed and combined with other content to allow teachers to customize classroom materials to their students' needs.
- Students often have trouble obtaining course credit for online classes, and teachers licensed in one state may not be able to teach online courses in another.
- Students and teachers may lack the digital literacy skills necessary to make use of broadband tools.

The following recommendations, which expand digital content and online learning systems and promote digital literacy, will help address these barriers.

### Expanding Digital Educational Content

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The federal government can address the first barrier through three steps.

- First, it should define and adopt standards for finding and sharing digital educational content as well as licensing educational material for digital use. Teachers, students and other users should be able to easily find, purchase, access and combine any digital resources meeting the standards.
- Second, government should take steps to create a pool of digital educational resources meeting the U.S. Department of Education's standards.
- Third, government should encourage authors and private sector organizations to contribute their material within these standards.

As with the music industry and, increasingly, with video and books, broadband can generate new models for creation, publication and distribution of educational resources.

- Greater flexibility in the way content can be accessed can have a direct impact in the classroom.
- Teachers can more easily select materials that fit the specific needs of different students.
- Digital content standards can help make that possible by offering a much wider choice of content than typically found in traditional printed curricular materials.

These three problems—finding, sharing and license compatibility— are the major barriers to a more efficient and effective digital educational content marketplace.

Digital content standards will make it possible for teachers, students and other users to locate the content they need, access it under the appropriate licensing terms and conditions, combine it with other content and publish it.

**Recommendation 11.1:** The U.S. Department of Education, with support from the National Institute of Standards and Technology (NIST ) and the Federal Communications Commission (FCC), should establish standards to be adopted by the federal government for locating, sharing and licensing digital educational content by March 2011.

**Recommendation 11.2:** The federal government should increase the supply of digital educational content available online that is compatible with standards established by the U.S. Department of Education.

- The Executive Branch should make digital educational resources they own available online in a format compatible with the standards defined in Recommendation 11.1.
- Whenever possible, federal investments in digital educational content should be made available under licenses that permit free access and derivative commercial use and should be compatible with the standards defined in Recommendation 11.1.
- The U.S. Department of Education should encourage vendors that sell paper-based educational materials to sell digital versions or provide digital rights independent of rights on printed materials; whenever possible this content should be aligned with the standards defined in Recommendation 11.1.
- Increasing voluntary digital content contributions to education from all sectors can help advance online learning and provide new, more relevant information to students at virtually no cost to content providers.

Congress should consider ways for educators to interact with their students using new educational content contributed by the public in the following ways:

- *Update TEACH Act.* Congress could consider updating the TEACH Act to better allow educators and students to use content for educational purposes in distance and online learning environments without prejudicing the other rights of copyright holders.
- *New Copyright Notice.* Congress could consider directing the Register of Copyrights to create additional copyright notices to allow copyright owners to authorize certain educational uses while reserving their other rights.
- *Facilitate Licensing.* Congress could consider providing a statutory framework to facilitate identification of copyright holders and securing of permissions in an efficient and cost-effective way, while retaining existing protections for educational uses without exceeding permissible exceptions and limitations under copyright law.

### Expanding Online Learning Systems

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Effective broadband-based solutions exist. But they often are deployed only in limited ways for various reasons, including regulatory barriers, market forces, limited resources and capacity constraints. Many promising ideas and applications have been developed in ways that do not foster wide-scale use and adoption or integration into the classroom. The following recommendations propose steps to bring online learning opportunities to scale.

**Recommendation 11.5:** State accreditation organizations should change kindergarten through twelfth grade (K–12) and post-secondary course accreditation and teacher certification requirements to allow students to take more courses for credit online and permit more online instruction across state lines.

Educational opportunities in the United States are distributed inequitably, usually because of unequal access to high-quality teachers and curricula.

- Online learning can help reduce such disparities.

Rural districts, in particular, strongly identify distance learning as important for meeting the needs of their students, who do not always have access to specialized teachers.

- These schools, as well as charter and small schools, have difficulty affording teachers for advanced classes because of limited budgets and programming flexibility.

While states need to change their requirements, the U.S. Department of Education should help states work together to achieve the national goal of improving online education opportunities.

### Unlocking the Power of Data and Improving Transparency

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In addition to benefiting individual students and teachers, the creation of a large-scale pool of electronic educational records could potentially transform education.

Anonymized records with detailed data on schools, educators and students would allow educators to determine in a fact-based fashion what works and when, and what the actual costs and benefits are of different practices.

- It would allow researchers to learn from the best practices and brightest ideas of every great teacher and principal in America.
- It would help educators determine when improved educational outcomes are a consequence of practices and techniques that are transferable to different contexts or due to factors not directly associated with educational practices.

At the moment, however, schools run on a patchwork of proprietary data systems that make sharing meaningful information about students slow and difficult.

- Consequently, teachers often have only bare-bones information about their students.
- Only 37 percent of all teachers reported having electronic access to achievement data for the students in their classrooms in 2007.

The recommendations that follow address a number of the barriers preventing the free and efficient flow of information in education.

**Recommendation 11.11: The U.S. Department of Education should encourage the adoption of standards for electronic educational records.**

- The U.S. Department of Education should support and accelerate the adoption of electronic educational records capability among states and local education agencies. It

should also set standards for sharing this information so data can be transferred across states.

- The U.S. Department of Education should support any secure authentication strategy developed by the Federal Chief Information Officer that permits private, decentralized identification of educational agencies, students and their data records.
- The U.S. Department of Education should recommend to Congress updates to student data privacy and protection laws that would improve online educational services.

Students should be able to select and share their best work with other educational institutions, the military or future employers from within their digital portfolios or other materials linked to electronic educational records.

### Modernizing Educational Broadband Infrastructure

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The FCC developed the Schools and Libraries universal service support mechanism (also known as E-rate), which offers schools and libraries the chance to receive telecommunications services, Internet access and internal connections at a discounted rate.

- Thousands of schools and libraries have received billions of dollars since the E-rate program began 12 years ago.
- As a result, Internet access is nearly universal in the nation's schools and libraries.
- Today, about 97% of public schools have access to the Internet.
- Types of connections from schools to districts include direct fiber (55%), T-1 or DS1 lines (26%) and wireless connections (16%).

However, inadequate connectivity speeds and infrastructure issues are frequently reported, and bandwidth demands are projected to rise dramatically over the next few years. Online educational systems are rapidly taking learning outside the classroom, creating a potential situation where students with access to broadband at home will have an even greater advantage over those students who can only access these resources at their public schools and libraries. The E-rate program needs to be updated and strengthened to ensure the rapid growth of online learning and data sharing in education are not limited by insufficient bandwidth.

### Excerpted from the Mt. Hood Cable Regulatory Commission's Communications Needs Ascertainment Study, April 2010

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Communications technology capability and use have a significant impact on local, as well as national and global, economic development. Here it was important to explore: multimedia literacy skills; local workforce development; new IT business development; local economy and employment; and private sector contributions and partnerships.

**Finding: The current insufficient level of skills to use communications technology effectively, commensurate with the level of need, is problematic for job seekers, employees and employers** – This insufficiency relates to lack of technology literacy and access, and must be addressed or it will impede the ability of the communities to stay competitive.

**Finding: The Community Access Capital Grant program is helping to increase multimedia skills** – The large majority of grantees indicated that the funds that they received have helped to develop multimedia skills for both clients and employees.

### *Adoption/Literacy*

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- In order to increase communications technology adoption for the oldest segments of a community, technology literacy and training opportunities and outreach must increase.
- For younger generations, technology literacy is significantly less of an adoption barrier than access to needed technology.
- Disparities in technology literacy are evident among teachers and staff in the various school districts.
- Many Communities of Interest expressed the need for a common understanding about communications technology literacy standards.
- Nonprofits, educators, local governments and multicultural groups expressed the continuing and increasing need for community media organizations that focus on multimedia training, literacy and education.

### *Capacity/Speed*

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- Public agencies, schools and libraries continually need access to higher network capacity.
- Private Service providers are seeing increasing demands on their network capacity.
- There is a significant need to increase the capacity of residential internet access networks to provide higher connection speeds.

**Finding: Multiple communities are utilizing communications technologies to contribute to workforce development** – This includes classroom instruction at all levels of education, distance learning for health care training, increased training and associated bicultural and bilingual capability development by those representing diverse populations and access to on-line resources for businesses.

### *Multimedia Literacy Skills*

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- A current insufficient level of skills to use communications technology effectively, commensurate with the level of need, is problematic for job seekers, employees and employers.
- The disparity in the level of multimedia literacy and technology in the business, nonprofit and institutional sectors may impede the ability of the community to stay competitive.
- The Community Access Capital Grant program is helping to increase multimedia skills.
- A higher level of promotion is needed concerning places to receive multimedia training.

### *Local Workforce Development*

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- Communications technology has significantly aided economic and workforce development locally.
- Conversely, predominant reliance on communications technologies for workforce development and employment activities can work to hinder certain populations unless they have the knowledge to utilize such technologies.
- Multiple communities are utilizing communications technologies to contribute to workforce development.
- Continued efforts to push for digital inclusion will have a positive impact on workforce and economic development.

**Finding: Inequities in communications technology access cause a significant divide among school-aged children** – Typically there is a higher emphasis placed on communications technology in homes with children. For example, households with children in the home in Multnomah County are more likely to report having internet access than the population at large (74% v. 72%). Nationwide, the FCC found that parents with minor children at home were more likely to have broadband at home (75% versus 65%). Additionally, the majority of households with children have a working computer (87%). This means that there is an even greater disparity among school age children who arguably need access to communications technology to keep up with their peers, than there is in the population as a whole.

What percentage of students in your school district is using Broadband at home for educational purposes?

### *Adoption/Literacy*

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There are a number of factors that affect adoption of a variety of communications technologies. Affordability is a significant issue in this regard. Technology literacy is also another major factor, as is relevancy of the content accessed through such communications technology.

**Finding: In order to increase communications technology adoption for the oldest segments of your community, technology literacy and training opportunities and outreach must increase**



– Diverse, older residents have not grown up with these technologies and are facing a significant literacy problem. Accordingly, the provision of literacy education and training as well as outreach to garner participation, is critical with older segments of the population.

**Finding: For younger generations, technology literacy is significantly less of an adoption barrier than access to needed technology** - The younger generations, even in immigrant and refugee homes and other populations that struggle for access, are learning the use of communications technologies at school, through friends, web-based tutorials, at public access internet locations even if they don't have the internet at home and at other places. For these populations, the ability to gain access to the technology is of greater significance than learning how to use them once they are available.

**Finding: Disparities in technology literacy are evident among teachers and staff in the various school districts** - A significant disparity in technology literacy, for example, is evident within school districts and within schools. It was noted in various focus groups that sometimes technology goes unused because instructors are unfamiliar with the use of the technology, or it is not used as effectively as it could be. In other cases, technically savvy students are enlisted to assist teachers, as well as other students. Then again, some younger teachers come in expecting the use of a wide range of technologies and would be able to use such technologies, but they are not available within a particular school or school district.

**Finding: Educational entities need to expand their role in helping resolve equity issues** – For example, School District representatives in focus groups indicated that they continue to push for equity in access, and can provide access to high speed internet while students are at school (although there are limitations in available equipment). However, many students, especially in lower socioeconomic households do not have such access at home. These students then utilize public libraries or friends, relatives or neighbors that do have access.

- Portland Public Schools representatives indicated that there should be a push to keep schools open into the evening in order to provide an environment where students could continue to have access and continue learning beyond the regular school day.
- Students, district staff and teachers also expressed the desire to allow students to bring personal computers and other devices to use for educational purposes at school but the inability of schools to provide equitable access for those students without the technology creates a barrier for classroom integration of such technology.

What can your school district do to address equity issues of access for your students?

Overall, it is clear that while multiple communities are pushing for higher levels of knowledge and skills and more support for training, there is a significant distance to go for all of the Communities of Interest to reach high levels throughout. As many ascertainment participants noted, to get there will take a significant amount of resources: money, people, time and available technology.

## [NTIA Educational Grants in Oregon](#)

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### Crook County Computer and Education Center

<http://www2.ntia.doc.gov/grantee/county-of-crook>

Crook County covers 3,000 square miles in a rural, high desert and forest area of central Oregon with spotty broadband availability and the state's highest unemployment rate following recent declines in forestry, tourism, and manufacturing. The County has partnered with a wide range of community organizations from the public, private, and nonprofit sectors to plan and propose a new, 65-station computer learning center to be built in Prineville, the county seat. It will be open to the public more than 90 hours per week and will provide the county's 25,000 residents with education, training and broadband access at a minimum speed of 10 Mbps, eventually reaching 100 Mbps. The Crook County Computer and Education Center project also plans to deploy a mobile lab with satellite connectivity and 12 mobile workstations to provide instruction and training to remote areas of the county.

### Communication Service for the Deaf, Inc.

<http://www2.ntia.doc.gov/grantee/communication-service-for-the-deaf-inc>

Broadband's ability to expand educational and employment opportunities is especially meaningful for Americans who are deaf or hard of hearing, a community that faces unique challenges in education and that suffers from a rate of unemployment much higher than the national average. Communication Service for the Deaf, Inc. (CSD) intends to expand broadband adoption among people who are deaf and hard of hearing and provide them with online tools to more fully participate in the digital economy. The project proposes to employ a combination of discounted broadband service and specialized computers, technology training from an online state-of-the-art support center customized to the community's needs, public access to videophones at anchor institutions from coast to coast, and a nationwide outreach initiative. Thousands will gain online access to all the Internet has to offer, including sign language interpreters, captioned video services, and other content and functionalities designed especially to advance their educational, employment, and healthcare interests.

### Generation ZD Digital Literacy Program

<http://www2.ntia.doc.gov/grantee/zerodivide>

ZeroDivide's Generation ZD Digital Literacy Program proposes a major regional training and broadband access program for low-income youth in communities across several Western states that will encourage the development of a new generation of broadband users. The project plans to enhance broadband services and outreach in Humboldt and San Benito counties and San Juan Bautista, California; Salt Lake City, Utah; Maui County, Hawaii; King, Snohomish, Skagit Island and Pierce counties, Washington; Multnomah and Washington counties and Portland, Oregon; and Santa Fe, New Mexico. It will also provide sustainable skills training, skill-sharing, and workforce development programs for the North Coast region of California, including for youth from the Native American Table Bluff Wiyot Tribe, Karuk Tribe, and Hoopa Valley Tribe.

### Links to IBM's Smarter Cities: Smarter Education

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[http://www.youtube.com/watch?v=4V9dPSyHets&feature=plcp&context=C4d45e36VDvjVQa1PpcFO\\_V1xrS6K2pMV4s4XdJluY7pz7fvXKaA%3D](http://www.youtube.com/watch?v=4V9dPSyHets&feature=plcp&context=C4d45e36VDvjVQa1PpcFO_V1xrS6K2pMV4s4XdJluY7pz7fvXKaA%3D)

There has never been a better time to make our education systems, both here and around the world, smarter. The good news is that there have been advances in education technology—cloud computing, open source systems, virtualization, analytics—that can help our education systems refresh outdated infrastructures with new functionality. They can become more interconnected, instrumented and intelligent. In a word, smarter.

<http://www.youtube.com/watch?v=EfL4zBWSRHA>

Build a smarter city with integrated smart classrooms and education systems.

## Health

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**(The following was excerpted from chapter 10 of the National Broadband Plan, “Health Care”)**

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### *Background*

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Improving Americans’ health is one of the most important tasks for the nation. Healthcare already accounts for 17% of U.S. gross domestic product (GDP ); by 2020, it will top 20%. America is aging—by 2040, there will be twice as many Americans older than 65 as there are today—and health care costs will likely increase as a consequence.

Broadband-enabled solutions can play an important role in the transformation required to address these issues. These solutions, usually grouped under the name health Information Technology (IT), offer the potential to improve health care outcomes while simultaneously controlling costs and extending the reach of the limited pool of health care professionals. Furthermore, as a major area of innovation and entrepreneurial activity, the health IT industry can serve as an engine for job creation and global competitiveness. It will be imperative to focus on adoption challenges, and specifically the government decisions that influence the system in which private actors operate, if America is to realize the enormous potential of broadband-enabled health IT.

### The Promise of Health IT and the Role of Broadband

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Health IT plays a key role in advancing policy priorities that improve health and health care delivery. Priorities set forth by HHS include the following:

- Improving care quality, safety, efficiency and reducing disparities
- Engaging patients and families in managing their health
- Enhancing care coordination
- Improving population and public health
- Ensuring adequate privacy and security of health information

Health IT supports these priorities by dramatically improving the collection, presentation and exchange of health care information, and by providing clinicians and consumers the tools to transform care.

Technology can help health care professionals and consumers make better decisions, become more efficient, engage in innovation, and understand both individual and public health more effectively.

- Analysis of information gathered through health IT can provide a basis for payment reform.

Broadband is necessary for these transformations in three ways.

- First, it enables efficient exchange of patient and treatment information by allowing providers to access patients' electronic health records (EHRs) from on-site or hosted locations.
- Second, it removes geography and time as barriers to care by enabling video consultation and remote patient monitoring.
- Third, broadband provides the foundation for the next generation of health innovation and connected-care solutions.

### *Broadband and Electronic Health Records*

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Physicians report that electronic health records improve patient care in many ways.

- According to one study often cited, electronic health record systems have the potential to generate net savings of \$371 billion for hospitals and \$142 billion for physician practices from safety and efficiency gains over 15 years.
- The e-prescribing component of EHRs helps avert known drug allergic reactions and potentially dangerous drug interactions, while facilitating the ordering of laboratory tests and reducing redundancy and errors.

### *Broadband and Video Consultation*

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Video consultation is especially beneficial for extending the reach of under-staffed specialties to patients residing in rural areas, Tribal lands and health professional shortage areas (HPSAs).

- In addition to increasing access to otherwise unavailable care, video consultations combined with store-and-forward technologies (e.g., sending images to a specialist at night, as opposed to obtaining a diagnosis during a patient's visit) could lead to significant cost savings from not having to transport patients.
- Avoiding costs from moving patients from correctional facilities and nursing homes to emergency departments and physician offices, or from one emergency department to another, could result in \$1.2 billion in annual savings.

Video consultation and remote access to patient data may also be critical during pandemic situations.

- If hospitals are at capacity or if isolation protocols are necessary to prevent the spread of infection, these technologies can help health care providers assist more patients and help patients avoid public areas.

### *Broadband and Remote Patient Monitoring*

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- Remote patient monitoring enables early detection of health problems, usually before the onset of noticeable symptoms. Earlier detection allows earlier treatment and, therefore, better outcomes.
- Estimates indicate that remote monitoring could generate net savings of \$197 billion over 25 years from just four chronic conditions.

### *Mobile Broadband and the Future of Health*

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This field encompasses applications, devices and communications networks that allow clinicians and patients to give and receive care anywhere at any time.

- Physicians download diagnostic data, lab results, images and drug information to handheld devices like PDAs and Smartphones; emergency medical responders use field laptops to keep track of patient information and records; and patients use health monitoring devices and sensors that accompany them everywhere.
- Innovations in mobile medicine include new modalities of non-invasive sensors and body sensor networks.
  - Mobile sensors in the form of disposable bandages and ingestible pills relay real-time health data (e.g., vital signs, glucose levels and medication compliance) over wireless connections.
    - Wireless body sensor networks reduce infection risk and increase patient mobility by eliminating cables; they also improve caregiver effectiveness.
    - Today's mobile cardiovascular solutions allow a patient's heart rhythm to be monitored continuously regardless of the patient's whereabouts.

## The Need for Action: Maximizing Health IT Utilization

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### *Limited Health IT Utilization*

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The United States is not taking full advantage of the opportunities that health IT provides. It lags other developed countries in health IT adoption among primary health care providers.

- The United States ranks in the bottom half (out of 11 countries) on every metric used to measure adoption, including use of electronic medical records (10), electronic prescribing (10), electronic clinical note entry (10), electronic ordering of laboratory tests (8), electronic alerts/prompts about potential drug dose/interaction problems (8) and electronic access to patient test results (7).
- Adoption rates for e-care are similarly low. A Joint Advisory Committee to Congress found that less than 1% of total U.S. provider locations use e-care.

What can communities do to promote or advocate for better e-care?

### *Significant Government Action*

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The federal government has launched a set of major health IT initiatives to overcome some of the barriers preventing the use of technology, with the goal of transforming America's health care.

- The largest step by far is a \$19 billion net investment to incent the meaningful use of certified EHR technology.
- States are being supported to develop policies and technologies that facilitate trusted health information exchange among providers and institutions; and more than a dozen Beacon Communities are being funded to showcase the program's potential, while providing important outcome data and implementation lessons.

Despite government actions, three gaps remain: adoption, information utilization and connectivity.

- These gaps must be filled to accelerate the benefits of broadband.

## Closing the Broadband –Enabled Health IT Adoption Gap

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Hospitals and physicians cite funding and unclear investment returns as major barriers to electronic health record adoption.

**Recommendation 10.1:** Congress and the Secretary of Health and Human Services (HHS) should consider developing a strategy that documents the proven value of e-care technologies, proposes reimbursement reforms that incent their meaningful use and charts a path for their widespread adoption.

- Marshal support from Congress, states and the health care community to drive e-care use.
- Provide the health IT industry with a clear understanding of the federal government's policies toward e-care.

### *Modernize Regulation to Enable Health IT Adoption*

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There is a wide range of problems around the legal and regulatory framework that underpins the use of health IT. Outdated laws and regulations inhibit adoption, and regulatory uncertainty deters investments in both innovation and utilization.

**Recommendation 10.2: Congress, states and the Centers for Medicare and Medicaid Services (CMS ) should consider reducing regulatory barriers that inhibit adoption of health IT solutions.**

Several rules have not kept up with technology changes and inhibit adoption of e-care and other health IT solutions. They include the following:

#### *Credentialing and privileging*

- CMS should revise standards that make credentialing and privileging overly burdensome for e-care; such standards conflict with the goal of expanding access to care.

#### *State licensing requirements*

- States should revise licensing requirements to enable e-care. State-by-state licensing requirements limit practitioners' ability to treat patients across state lines.

#### *E-prescribing*

- Congress and states should consider lifting restrictions that limit broader acceptance of electronic prescribing, a technology that could eliminate more than two million adverse drug events and 190,000 hospitalizations, as well as save the U.S. health care system \$44 billion per year.

**Recommendation 10.3: The FCC and the Food and Drug Administration (FDA ) should clarify regulatory requirements and the approval process for converged communications and health care devices.**

Some examples of the convergence between communications and medicine include the following:

- Mobile applications that help individuals manage their asthma, obesity or diabetes,
- A Smartphone application that displays real-time fetal heartbeat and maternal contraction data allowing obstetricians to track a mother's labor,

How can your community encourage the development of these mobile applications and network capabilities locally?

- An iPhone application that presents images for clinicians making appendicitis diagnoses,
- Wearable wireless patch-like sensors that transmit health data over commercial wireless networks to practitioners, caregivers and patients.

The FCC and the FDA should collaborate to address and clarify the appropriate regulatory approach for these evolving technologies.

## Unlocking the Value of Data

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Data are becoming the world's most valuable commodity. In multiple sectors—including finance, retail and advertising—free-flowing and interoperable data have increased competition, improved customer understanding, driven innovation and improved decision-making.

The advanced use of data in health care offers immense promise in many areas:

### *Better treatment evaluations*

- By using applications to collect and analyze the existing data, which today are locked in paper charts, physicians and researchers can evaluate the efficacy and side effects of treatments from disparate groups of patients in order to develop best practices.

### *Personalized medicine*

- Genomic research produces huge amounts of data that, when combined with clinical data, could enable development of better targeted drugs. Such drugs could improve outcomes and reduce side effects.

### *Enhanced public health*

- Health IT enables widespread data capture which in turn allows better real-time health surveillance and improved response time to update care recommendations, allocate health resources and contain population-wide health threats.

### *Empowered consumers*

- Health IT applications that provide easy access and simplify vast amounts of data empower consumers to proactively manage their health.

### *Improved policy decisions*

- The right data will help make outcomes-based reimbursement possible by allowing consumers, payors and providers to understand the impact of various prevention and treatment options.

## Health Care Providers' Broadband Needs

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Health care providers' broadband needs are largely driven by the rapidly increasing amount of digital health-related data that is collected and exchanged. A single video consultation session can require a symmetric 2 Mbps connection with a good quality of service. There is a wide range of requirements to support EHRs and medical imaging. Over the next decade, physicians will need to exchange increasingly large files as new technologies such as 3D imaging become more prevalent.

### *Problems with the Current Program*

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In 1997, the FCC implemented the directives of the Telecommunications Act of 1996 by creating a Rural Health Care Program, funded through the USF. The program provides three types of subsidies to public and nonprofit health care providers.

- First, the program subsidizes the rates paid by rural health care providers for telecommunications services to eliminate the rural/urban price difference within each state (via the Telecommunications Fund).
- Second, to support advanced telecommunications and information services the program provides a 25% flat discount on monthly Internet access for rural health care providers and a 50% discount for health care providers in states that are entirely rural (via the Internet Access Fund).
- Lastly, the FCC adopted a three year program that provides support for up to 85% of the costs associated with deploying broadband health care networks in a state or region (the Pilot Program).

Many health care providers have difficulty accessing broadband services because they are located in areas that lack sufficient infrastructure or areas where broadband service is significantly more expensive.

- Less than 25% of the approximately 11,000 eligible institutions are participating in the program, and many are not acquiring connections capable of meeting their needs.
- In 2009, 82% of Telecommunications Fund spending supported connections of 4 Mbps or less, which is a minimum for single physician practices that are using a robust suite of broadband-enabled health IT.
- That speed is increasingly insufficient for the clinics and hospitals that are the major participants in the program.

### **Recommendation 10.6: The FCC should replace the existing Internet Access Fund with a Health Care Broadband Access Fund.**

- The Health Care Broadband Access Fund should support bundles of services, including bundled telecommunications, broadband and broadband Internet access services for eligible health care providers.

- To allow health care providers to afford higher bandwidth broadband services, the subsidy support amount under the Health Care Broadband Access Fund should be greater than the current 25% subsidy support under the Internet Access Fund.

**Recommendation 10.7:** The FCC should establish a Health Care Broadband Infrastructure Fund to subsidize network deployment to health care delivery locations where existing networks are insufficient.

**Recommendation 10.8:** The FCC should authorize participation in the Health Care Broadband Funds by long-term care facilities, off-site administrative offices, data centers and other similar locations. Congress should consider providing support for for-profit institutions that serve particularly vulnerable populations.

**Recommendation 10.11:** The FCC should periodically publish a Health Care Broadband Status Report.

Health IT is in its infancy. As technologies rapidly evolve, so too do expectations for health IT adoption in America. Supporting health IT requires further analysis of complex issues and the development of solutions to address them. The work ahead will be most successful if it combines the efforts of government, industry and the health care community.

## Health IT in Oregon

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(Excerpted from the Oregon Health Network website)

<http://www.oregonhealthnet.org/>

### *The OHN Story*

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In late 2006, the Federal Communications Commission announced its plans to establish the Rural Healthcare Pilot Program (RHCPP). This program was designed to deploy a regional broadband network infrastructure connecting various health centers across the country, and would fund up to 85% of the infrastructure design, construction and ongoing costs for the 5-year duration of the program.

Dedicated teams of technology, telecommunications, and health care experts have joined forces to build the state's first telehealth superhighway. Thanks in large part to Federal Communications Commission (FCC) subsidies and in cooperation with dozens of industry leaders, government leaders and non-profit organizations across the state, the Oregon Health Network (OHN) provides the broadband infrastructure needed to ensure that all Oregonians have equal access to the best possible health care regardless of their location. Upon full realization, OHN will interconnect all Oregon hospitals, clinics, public health offices, physicians, mental health, dental and optical clinics, and health education institutions with a level of interactive service delivery and access to resources only imagined in our rural and underserved communities.

## Technology

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### THE OHN TECHNICAL PLAN IS SIMPLE

OHN arranges for its participants to contract with telecommunications vendors to provide a guaranteed amount of reliable data capacity from their location to an Oregon data switching facility in Portland, the Northwest Access Exchange (NWAX).

NWAX permits each end user site to connect with many other sites throughout Oregon, including all OHN participant sites. Therefore, one connection from a clinic would be sufficient for it to reach any medical facility in Oregon with high quality service. Even though different telecommunications vendors provide service to different facilities in different parts of the state, the guaranteed availability and quality of service on each link to the central switch is sufficient to ensure that the connection between any two locations will permit reliable real-time medical consultations and procedures.

### OHN'S TECHNICAL APPROACH

Prior to OHN, health facilities had two basic choices for data network connectivity.

1. They could lease dedicated lines between pairs of locations or
2. They could use the public Internet.

Leased line solutions for data are similar to the earliest days of voice telephony before the advent of central office telephone switches, when conversations were possible only between two points on the opposite ends of a line. Once central office switches were introduced, customers only needed one line to the central office and could be connected there to any other customer without being required to arrange for lines to any other location. OHN provides a similar solution for data networking in Oregon by requiring a high quality link from each end user location to a common data switching location. That single broadband connection then permits reliable connectivity with every other end user location connected to the switch.

This high quality broadband connectivity is quite different from that of the public Internet. Because the Internet is not a single network but is the result of interconnecting a large number of independent networks throughout the world, no Internet Service Provider (ISP) can control the quality of service except on its own portion of the complex network. Consequently, all ISP contracts are “best efforts” contracts with no guarantees of the amount or quality of data transport provided. Since all of the major Internet connection points on the west coast of the United States are in California or Washington, almost all Oregon Internet traffic is routed out of state before getting from one Oregon destination to another.

How can your community support the Oregon Health Network with policy and/or advocacy?

The lack of quality guarantees has made the public Internet unsuitable for real-time medical applications, including telemedicine consults and real-time medical education applications. (Health facilities are using the Internet for some of these applications, but complaints about lack

of quality have limited the amount of use.) OHN makes it possible to obtain the economic advantages of Internet-like data transmission and the availability of connections to a very large number of sites, while retaining the quality of service that was previously available only on dedicated leased lines.

#### [NETWORK OPERATIONS CENTER \(NOC\) by Easystreet](#)

EasyStreet, an entrepreneurial Oregon business located in Beaverton, describes itself as Oregon's leading managed services provider. One of their service offerings is network operations center (NOC) services designed to monitor data network operations, respond to early warning signals to prevent outages and provide trouble-shooting support when problems do occur. EasyStreet was the winning bidder among three competing companies offering such services in response to an OHN competitive procurement for the OHN NOC.

EasyStreet will install monitoring devices at OHN participant premises and at the OHN primary network interconnection point at the NorthWest Access Exchange (NWAX) in Portland. These devices will permit the OHN NOC to monitor OHN data traffic in real time and determine whether OHN network vendors are meeting their quality of service guarantees.

Unlike the public Internet, which provides "best efforts" services with no guarantee of network capacity or quality, OHN data services require guaranteed service quality sufficient for real time medical and educational applications. EasyStreet technicians are available 24 hours a day 365 days a year to help OHN participants prevent network outages or quality degradations and to help diagnose problems and restore service quickly when network problems occur.

#### [Links to IBM's Smarter Cities: Smarter Healthcare](#)

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[http://www.youtube.com/watch?v=D\\_CKK0wN7Pc&feature=related](http://www.youtube.com/watch?v=D_CKK0wN7Pc&feature=related)

Build a smarter city with intelligent, interconnected and real time health information technology.

<http://www.youtube.com/watch?v=P0TkZMUF3vM&feature=related>

This short video is a light-hearted introduction to the concept of a smarter planet... and what it means for our health systems. Take a look at what is possible when a system is instrumented, interconnected and intelligent.

#### [Cisco WebEx Case Study: Greater Baltimore Medical Center](#)

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<http://www.cisco.com/en/US/prod/ps10352/webexcase/GBMC.html>

Interactive WebEx meetings allow surgical team and speech therapists to make virtual "house calls" to remote patients