

Community Broadband Snapshot Report™

November 2017



Telehealth & Broadband : In Sickness and in Health

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Executive summary: Broadband and Telemedicine – Cradle-to-Grave Healthcare

Unite your broadband team, healthcare stakeholders, public emergency, and transportation stakeholders to integrate broadband and telemedicine, and maximize your community broadband network. This integration helps you transform broadband infrastructure into a healthcare asset.

Telemedicine initially described a simple concept of remotely monitoring a patient's health data wherever they might be located. Many of these patients were elderly, living at home, and suffering from a long-term condition or chronic disease. Today, telemedicine is using intranet or Internet networks to diagnose, administer, initiate, assist, monitor, intervene, and/or report a medical procedure.

Telemedicine touches many medical disciplines, including mental health, tele-stroke, dermatology, women's health, and physical rehabilitation. Just about every person from newborns to seniors may have telemedicine influence their lives at some time. However, access to broadband can determine how convenient, affordable, and far-reaching are the telemedicine benefits communities receive.

For community broadband planners, managers and funders, this report highlights telemedicine applications and services that Internet networks need to support. Of special concern are city and county healthcare stakeholders who envision telemedicine services supporting doctors, nurses, and other providers as well as patients at home since this can impact broadband infrastructure designs.

In the [U.S., the telehealth market is driven](#) by the rising healthcare costs, upcoming regulatory policies, rising prevalence of chronic diseases, shortage of physicians, and increasing funding for telehealth. However, broadband is a driver whose role may be hidden, for better or worse. Healthcare providers and telehealth vendors need to be aware and prepared for challenges that hinder telemedicine adoption.

To ensure that networks maximize telemedicine applications, healthcare stakeholders need to work closely with broadband planners. As local governments, electric co-ops, and others launch and market community-owned networks, it's advisable for them to meet regularly.

This report advises broadband builders/owners, healthcare providers, and the telehealth vendors of the advantages to fundraising when broadband networks are used to deliver telemedicine and healthcare. The FCC's Rural Healthcare Connect Fund is a case in point. Telemedicine applications and services can be promoted to increase institutional and individual subscriptions to the community network.

The report concludes with recommendations for maximizing the integration of broadband and telemedicine.

I. Community-owned broadband's stake in the telehealth game

Community-own broadband (highspeed Internet) networks have the power to transform entrepreneurs into captains of industry, change the course of governments, and make people LOL at kitty antics. They also can contribute to healing the sick, rehabbing the lame, or easing troubled minds.

Those in the business of broadband in Chattanooga, Danville, VA, Lafayette, LA and over 400 municipalities with their own networks will tell you broadband is a change agent. For healthcare professionals, vendors and community leaders, broadband is technology that makes the magic of telemedicine and telehealth happen.

"Many telehealth applications involve real-time interactions between patient and provider, or virtual collaborations between healthcare professionals," states Eric Bacon, President of AMD Global Telemedicine. "These applications often involve a live video feed along with streaming data from applications or devices. The faster the broadband, the more efficient the healthcare assessment can be."

"The main medical disciplines that have adopted telemedicine historically has been tele-stroke,



mental health, and dermatology," says Bacon. "However, new and exciting use cases for telemedicine are being adopted all the time. One such growing application is woman's health, particularly in underserved and rural areas.

When AMD did a 340-site countrywide telemedicine program for Bolivia, women's health was the main driver." Many rural U.S. communities are similarly disadvantaged, and

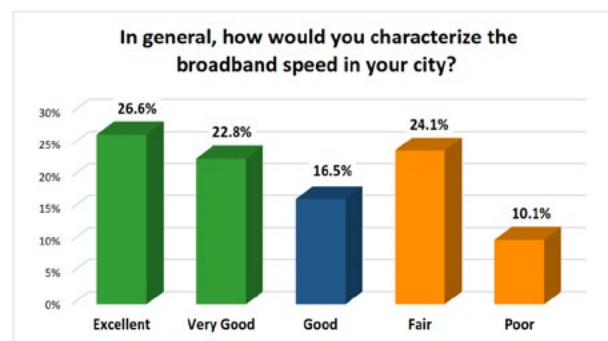
telemedicine plays a critical role in their access to much needed healthcare.

I concur with AMD's assessment," Jon Belsher," M.D. and of Board member of [Partners Urgent Care](#). "I expect a tidal wave of activity in the area of tele-mental health over next 10 years. You don't need a lot of equipment in that discipline. There is a severe shortage of specialists, an overwhelming need for mental health services, and a high probability for successful patient outcomes. In addition, a lot of businesses are assessing adding telehealth clinics on their campuses.

Broadband adoption – or lack thereof – may hinder telehealth

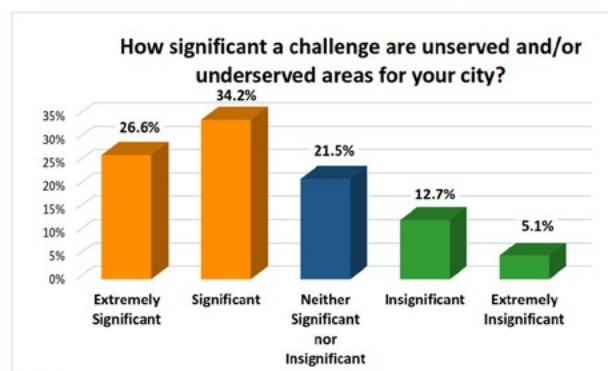
Only 62 percent of rural Americans have broadband installed in their homes, [according to the think tank New America](#), and those who do often pay exorbitant prices for sluggish speeds. In fact, 39 percent of rural Americans are unable to purchase Internet service that meets the Federal Communications Commission's minimum standards for high-speed access – 25Mbps/3Mbps – at all. Other research from Strategic Network Group strengthens New America's case (see charts below).

Their Broadband Is Just Not Good Enough



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Three in Five Cities are Faced with Challenges of Under and/or Unserved



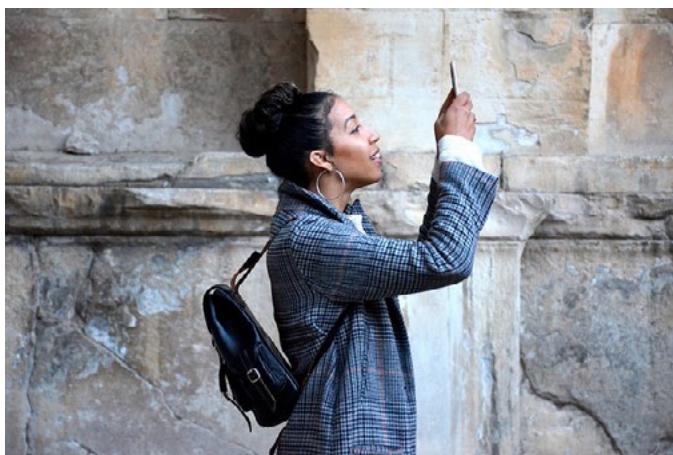
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“High-speed Internet is similar to the American freeway system and how it drives commerce,” says Milton Chen, CEO of telehealth company Vsee. “If you don’t have the freeway, there’s nothing to talk about. Whether you’re looking at rural communities or metropolitan areas, without the Internet there’s nothing talk about. You can’t drive telehealth without it.

“Over 70% of small businesses, which include small healthcare clinics, have less than 4 Mbps upload speed,” according to [data collected by Strategic Network Group](#). Speed alone will not drive utilization and impacts, but minimum upload speeds are a key enabler, empowering SMEs [small and medium enterprises] to take full advantage of broadband.”

[FCC Chairman Ajit Pai wants to change the definition back down to 10/1](#), which could adversely affect telemedicine vendors and users. If each member a four-person family is streaming their own content, the household needs 20 megs. Homework apps in in high school and college are video centric. Entertainment is bandwidth intensive. As telemedicine apps become more advanced, expect them to require greater speed.

Angela Siefer, Director of the [National Digital Inclusion Alliance](#), believes vendors and healthcare providers need to understand the relationship between speed and capacity. “A lot of people use speed and capacity interchangeably when they discuss broadband but they aren’t interchangeable.” For example, even if a residence subscribes to 10 Mbps of Internet speed, between 4:00 p.m. and 10:00 p.m. the network’s capacity (how much data passes from point A to B) can make 10 megs per residence a pipe dream. Low speeds make broadband difficult, inadequate capacity makes it worse.



“In addition, be aware of the dangers of data caps,” Angela says. “A significant number of African-Americans and other minority consumers use smartphones such as iPhones as their primary onramp onto the Internet. Many cellular carriers impose data caps on smartphone data. Several half-hour video doctor visits by members of the household in a month could blow through a data cap, costing consumers expensive overage fees.”

II. Where telehealth users’ and community broadband owners’ needs meet

A local government, public utility, co-op, or community nonprofit can own the broadband network infrastructure. These entities might partner with a private local telephone, ISP or WISP to build or run a network. Or a locally run healthcare consortium can own the physical network, and hire a private entity to operate the broadband service.

General healthcare, telehealth, and telemedicine delivery can make a strong financial business case that justifies the broadband investment, and makes it easier to raise money for these networks. Community leaders, healthcare stakeholders, and the telehealth industry should consider partnering with each other to pursue some political and public policy objectives that ultimately boost broadband expansion.

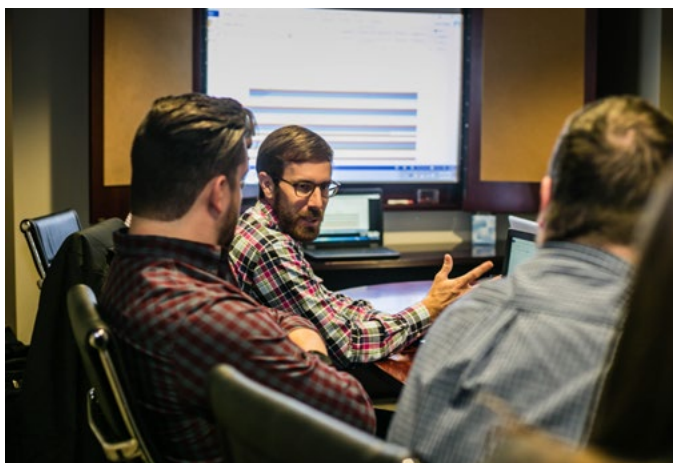
“We would love to see healthcare facilities own broadband networks across entire cities,” says Lauren Bender, Business Development Manager at Foresite Group. “The hospitals are not ‘getting into the utility business’ by doing this, they would simply own the infrastructure over which healthcare is delivered. Managing and operating the network could all be contracted out to a third party.”

Community-owned broadband’s history of meeting healthcare needs

The primary reason that advocates push for communities owning the broadband infrastructure is for control over meeting

communities' needs. When decisions about pricing, network quality, availability, etc. are the sole purview of a private entity, decisions are always made with companies' best interests in mind.

In 2001 Springfield, MO's public utility offered a gigabit service over its Springnet fiber network. Very few people knew what gig speed was, let alone gig applications. But the local hospital understood right away what the benefits were, according to Springnet's Manager of Network Architecture/Support Todd Christell.



The hospital relocated their radiology department, and used the gig connection to link the main facility, the ER, the clinics and other sites to send their x-rays to the radiologists. "The revolutionary part was the evolutionary path to grow their business through the capabilities of our network," states Christell. Regardless of how remote their buildings were, personnel could access and manipulate data at gig speed with low latency. This immediate benefit justified the hospital's investment.

Lafayette, LA decided in 2005 they wanted their own broadband network, and passed a ballot initiative that paved the way for LUS Fiber. Providing leading-edge healthcare technology was one of the things high on their list. "Telehealth advances improved services such as critical care for patients in our smaller hospitals, says Terry Huval, Director of LUS Fiber.

Huval believes, "We can create video links with best heart physicians or specialized hospitals in the country. The network will give our medical community new capabilities to exchange data and improve service."

Co-ops are getting more involved as well. Luis Reyes CEO of Kit Carson Electric Cooperative in New Mexico, says, "We don't expect to attract new hospitals in to the area. But we do use broadband to help the clinics we currently have to stay and expand their services. A few were ready to shut down a couple of years ago because of lack of broadband. We have gig service between our main hospital and hospitals in Albuquerque, so the hospitals can transfer files quickly."

Matt Larsen, owner of wireless ISP Vistabeam, believes there is a definite need for telehealth technology. "A number of healthcare facilities in rural areas are struggling to survive, particularly health clinics. By linking those facilities wirelessly with hospitals in the bigger cities, people can have the benefit of specialists without having to drive hours."

As more community-owned networks go online, "Some find more interest among stakeholders for using broadband for telehealth and its subset telemedicine than for economic development," says John Windhausen, Executive Director of the Schools, Health & Libraries Broadband (SHLB) Coalition. "There can be several reasons for this, starting with the fact that almost everybody is affected by healthcare."

III. Public safety and telehealth

Local, state, and federal governments are spending huge amounts of money on public safety, including emergency first responders, police, fire, and other agencies. Telemedicine can facilitate immediate treatments and ongoing medical care.

Man-made or natural traumatic events require quick response. Telemedicine can assist with diagnosing and treating individual or mass victims. Fast, reliable broadband coverage is critical in these situations.

For what might be months after the initial carnage of a hurricane, earthquake, or other calamity, a community's medical care infrastructure might be destroyed or seriously disrupted. Segments

of a community might be isolated from medical treatment, such as what happens after a quake.

Bacon recalls, “With the recent hurricanes such as Irma and Harvey, we had physicians from all over the world willing to donate their time over video to treat patients and we can set up telemedicine systems to support their efforts. But how do you capitalize on physicians’ services to offer telehealth consults, if there is no connectivity available?

When minutes matter

When life hangs in the balance, trauma care at the scene of a car wreck, heart attack shooting, or other traumatic injury, telemedicine that includes real-time video, computerized monitoring and reliable broadband makes the difference.

Real-time video cams are physicians’ and specialists’ eyes on the street, monitoring equipment puts their fingers on the pulse, literally. Portable ultrasound technology is an ER doctor’s best friend when it comes to quickly diagnosing and treating injuries to muscles, tendons, and many internal organs.



Emergency responders at a train wreck miles outside of town or a house located in sparsely populated areas can feed ultrasound images, readings on heart rate or other vitals, and audio observations to physicians at a rural clinic or a major city hospital. In turn, physicians can more accurately instruct responders how to treat the victims.

“Ultrasounds can determine if there’s internal bleeding, the extent of a fracture, whether a person is just suffering from indigestion or a

heart attack,” says Michelle Alexander, clinical marketing director for Point of Care Ultrasound. “You don’t want a paramedic losing valuable time getting to where there’s coverage.” Her company is pilot-testing a product called SonicXpress that is designed to use satellite and existing cellular or WiFi wireless to establish a reliable speed to transmit the data.

Assessment by video also saves significant costs. “If someone injured their hand on a farm or in an industrial plant, they would be sent by helicopter to our hospital, we’d check them and send them home to wait for a doctor to schedule them for a visit,” says Tina Benton, Center for Distance Health Director at the University of Arkansas for Medical Sciences (UAMS). That helicopter costs \$30,000 a trip.

In 2014, UAMS partnered with the Arkansas Trauma Communications Center (ATCC) to create an orthopedics hand injury program. Benton says, “Now we can be hundreds of miles away, yet examine the hand by video and direct treatment at the hospital nearest the patient. We can coordinate access to fellowship-trained hand surgeons when necessary.”

The M*A*S*H concept and telehealth works in natural disaster response

When many people hear the word “MASH” they probably think of the long-running TV show. Some might remember that M*A*S*H is an acronym during the Korean and Vietnam wars for Mobile Army Surgical Hospital. But telehealth?

MASH units were comprised of prefab tents, various medical supplies, surgeons, nurses, and Cpl. “Radar” O’Riley. These were designed to get experienced medical personnel closer to the front so that the wounded could be treated sooner and with greater success.

There are various natural disasters – quakes, floods, forest fires, etc. in which there is a dramatic event that can create dozens or hundreds of critical care victims. This is followed by weeks or months when the roads, freeways, healthcare, and other infrastructures are destroyed, or significant numbers of people

can't access the infrastructures that are left.

The survivability of the broadband infrastructure during times of such despair is paramount to a community's telehealth and general healthcare natural disaster response strategies. The appropriate stakeholders should have meetings and disaster drills to ensure success. It's also important that broadband infrastructure be comprised of wireless and wired technologies.



"When emergency crews are spread thin right after a natural disaster, telehealth agencies can activate to help people until emergency crews can get there," says Bender. "Or they can help 911 prioritize calls based on their severity. A robust, well-engineered broadband network with redundancy has to be in place in order for this system to work reliably and efficiently."



Imagine. "Officials deliver by truck or helicopter, self-contained units that can be deployed in 15 minutes to create small healthcare clinics with self-generating power, water, satellite, and telemedicine technologies," says Bacon. "You can connect with remote physicians and specialists by video, to take care of patients immediately. With specialty telemedicine

devices and digital technologies remote doctors can do clinical assessments on patients as if they were there in person."

As we have seen in Puerto Rico, healthcare professionals must perform surgeries and other life-saving procedures in the immediate days following a disaster. The telehealth clinics can take on the traditional role of the MASH units and handle triage – the sorting of patients according to the urgency of their need for care.

These telehealth clinics can be used to treat people with chronic illnesses, debilitating injuries, people with burns, cuts, serious wound care, etc. Theoretically these clinics serve as free-standing hospitals.

Bender feels, "Broadband networks and telehealth data can help agencies study natural disasters, therefore helping better prepare for them for the next disaster. The networks are able to detect earthquakes, floods, fires, etc. with the right technologies operating across the broadband infrastructure."

IV. Single hospitals get stronger with telehealth

The one- or 2-facilities hospitals rely on creativity and tenacity to continue to serve their community. Telemedicine definitely can be key to their strategies.

"It's good to remember what leads to telehealth success: 1) positive patient outcomes, 2) cost-cutting, and 3) patient satisfaction," says Lance Horbach, Senior Living Director at Independent Insurance Services. "Consider how your proposed or current broadband infrastructure might facilitate meeting these goals?"

Here are ten basic points that also contribute to successful programs. There are exceptions, but the approach to each of these guidelines appears to maximize the likelihood of success or failure of a telehealth program. [Download for review.](#)

Telemedicine takes baby steps at Children's Mercy Hospital

For the moment, telemedicine is only a small percent of what Children's Mercy Hospital in Kansas City does. They conduct several thousand clinic visits per month, live and in person, and of those about 200 are via telemedicine. They have a doctor in California and one in Saudi Arabia who do all of their work via telemedicine.



The hospital employs several people who are full-time facilitators of telemedicine activities. There are doctors in 23 specialties that see patients via telemedicine, but like any other hospital, Children's Mercy has plenty of room to grow. The hospital's radiology and cardiology services are contracted out on behalf of other hospitals' pediatric patients. Mercy's specialist reads the resulting charts, which saves hospitals the cost of hiring a specialist who wouldn't be used frequently.

John Baker, Senior Analyst Telemedicine and Video at the hospital, says, "You need good or excellent broadband for your live services to be useful. When I came on board three years ago, our Director of Telemedicine had done a lot of research and determined that we needed to accelerate our efforts and our bandwidth."

Children's Mercy uses AMD Global Telemedicine's devices and software to link the main hospital, their satellite hospital, and their general offices down the street. They will expand the technology when they build the new clinic in Junction City, Kansas. The hospital manages three satellite clinics, and the staff visits several rural clinics on a quarterly basis to provide telemedicine services.

"We generate 13-16 gigabit a day Monday-Friday," Baker says. "There are 200 telehealth visits a month that are 30 minutes each. We have a 2 Gbps connection to our main hospital, a 1Gbps to a couple of sites, and a 100 Mbps, 50 Mbps and a few actual T-1 lines that have 1.5Mbps bandwidth. We are unable to do telemedicine with the sites that have bare T-1's since they don't have enough bandwidth to do video."

The main hospital uses a local broadband provider, though additionally they have tested Google Fiber. The clinics are in the metro area, so not a true rural setting. The clinics use ISPs located closest to them, but unfortunately, those connections were not reliable or fast enough.

The hospital staff carries a commercial hotspot that they plug into rooms at the clinics to provides 20 Mbps of cellular coverage. The hospital's ambulances only provide transportation services between facilities, and each vehicle has cellular wireless antennas and a portable hotspot.

Danville, VA - came for the economy, stayed for the healthcare

In 2006 the Danville, Virginia public utility launched a fiber network ([nDanville](#)) that eventually created a virtual universe of medical knowledge and talent.

"The healthcare argument was always understood, but it wasn't the one of the drivers network at the time," states Frank Maddux, MD and co-founder of Gamewood, Inc, an ISP that joined nDanville. "People didn't understand how important the network would become and what healthcare applications there would be. They see it now."



The Danville Regional Medical Center is one of the town's largest employers. They have several clinics around town that moved a lot of data, so they link all of their facilities on nDaviile. The high-speed network produced such a high quality and quantity of medical services that make Danville Regional is now a major draw for businesses looking to re-locate. They later changed their name to Sovah Health.

The hospital leveraged the gig broadband network to dive into telemedicine. Sovah Health - Martinsville's (the new facility) emergency department has partnered with the Duke TeleStroke Network in North Carolina to get real time access to Duke Medicine's neurologists, stroke care specialists, and tele-stroke technology.

V. Telehealth and broadband to create healthcare hubs

A community can use its broadband infrastructure to link the hospitals and clinics in "hub" as a way to get some economy of scale for its healthcare properties, broadband infrastructure, and/or telemedicine applications. Communities can consider hubs anchor tenants, similar to the big-box stores in a mall. Telemedicine providers connecting rural healthcare facilities to each other and to residents can serve as the initial anchor tenants for community broadband networks.

Telehealth let's Baystate Health give its rural hospitals a leg up

A hospital and their rural satellite facilities in Massachusetts definitely give their communities renewed hope that more of their citizens can receive leading-edge healthcare now and in the future. Telemedicine is the key.

Based in Springfield, Baystate Health is a not-for-profit healthcare organization serving more than 750,000 people throughout western New England. Its health system includes an academic medical center, community hospitals, homecare, and hospice. With a workforce of about 11,500 team members, Baystate Health is the largest private employer in the region.

Their rural community hospitals didn't have enough medical specialists to serve people in need (cardiologists, vascular neurologists, etc.). Springfield-based specialists had to travel upwards of an hour each way to service community hospitals.



Baystate Health's solved their challenges by leveraging [telemedicine technology](#) to link more than 30 Springfield physicians with patients at three rural hospitals. In the program's initial three months, 12 nurses and medical assistants at the community hospitals learned to use the new equipment. Through the use of telemedicine, patients can now receive care closer to their homes and physicians can devote their time to treating patients instead of traveling.

Urban communities can build healthcare hubs too

Illinois Medical District plans to take broadband and telemedicine to new levels with high-speed fiber. The 560-acre District includes four major hospitals, medical research facilities, labs, a biotech business incubator, two medical universities, and over 40 healthcare related facilities, all connected by fiber.



In big-city Chicago where one would expect to find an abundance of Internet capacity, “The District is in a broadband desert,” states Former District Executive Director Warren Ribley. Some hospitals had to put research onto a CD and deliver it to another hospital.

“There are currently numerous initiatives happening throughout the District, which we believe will act as a catalyst for continued growth and economic development,” say Ryan Gage, Director of Marketing and Communications. “Cook County recently announced a major campus redevelopment project. The Chicago Center for Arts and Technology and Vertipoint Chicago have been added. Rush University Medical Center and the Chicago Lighthouse for the Blind are also planning expansion projects in the near future.”

Arkansas creates an ultimate statewide healthcare hub

Arkansas used to lead the United States in stroke deaths. Then came [AR SAVES](#) in 2008. The [Center for Distance Health](#) at the UAMS partnered with the Arkansas Department of Human Services to form Arkansas Stroke Assistance through Virtual Emergency Support (AR SAVES)



AR SAVES was instrumental in the [state moving down to number 6](#) in 2016. “We are one of the few, if not the only, hospital in the United States that provides a statewide telemedicine application that crosses over multiple hospital systems,” says Tina Benton, Director of the Center for Distance Health. “In a few weeks we will be connected to 53 of the 80 hospitals in the state of Arkansas.”

AR SAVES Director Renee Joiner adds, “When the program started there were only three vascular neurologists in the entire state. We connected only 10 hospitals in the first year, but we grew it from there. We identified and trained at each hospital a dedicated tele-stroke coordinator (nurse facilitator), ER physicians and nurses, and even the floor nurses.”

Before the program, less than 1% of stroke patients statewide received the de-clotting drug alteplase (TPA). “We’ve gone to 33% of the patients in those 53 hospitals who qualified for the program to receive TPA,” says Roy Kitchen, Arkansas e-Link Director.

Benton says, “We share a fiber ring with several other health and telehealth programs throughout the Arkansas hospital systems, including a huge trauma care program. If there was a big explosion near one of the hospitals, that’s where patients could be triaged and treated in consultation with specialists at other hospitals via telemedicine. There are only 16 burn injury beds in Arkansas, so they use telemedicine to triage these injuries.”

VI. Throwing your net wide for a healthcare hub

In healthcare there is a concept called “Continuum of Care.” This system provides a comprehensive integration of multiple healthcare providers spanning all levels and intensity of care. It allows physicians to have choices and solutions they didn’t have before. A continuum of care reduce costs, improves outcomes, and increases patient satisfaction.

A healthcare hub can strengthen and expand the continuum of care. Besides hospitals and clinics, what medical care, telehealth, prenatal care, mental health, or preventative care entities exists in your community? How can you use the power of broadband to unleash the potential of these resources, even if a resource is in another town or county?

Are there prisons or other correction facilities with medical resources and is there a place in a healthcare hub for them? From the network owner’s perspective, does it make sense to have

special pricing for doctors in private practice to strengthen the continuum? When you're laying routes for broadband deployments, can a few local employers fit into your healthcare hub?

Entrepreneurs in the Continuum

Could entrepreneur radiologists work within your hub? Dr. Madduk of Gamewood believes Tele-radiology is one area of telemedicine that is becoming universally adopted because there are clear protocols for how it's to be used, and there are clear expectations of outcomes.

Radiologist Dr. Jim Busch is one of Chattanooga's premier medical business stories. He brought the city's radiologists under one organization, Diagnostic Radiology Consultants. Radiologists connect through the city-owned gigabit networks to the other team members and to the city's hospitals.



Dr. Busch wrote software to enable the group to deliver new services. The Chattanooga's network and software together allow the team to serve more hospitals and patients, grow and expand the business, and create another hook that draws individuals and businesses to town.

The network enables the radiologists and medical facilities to save 40 hours per radiologist. 40 hours represents a sizeable dollar savings. Dr. Busch also stated that it is not uncommon for more than 10 radiologists to be sending multiple files simultaneously that each are 80 - 100 megabits in size.

The ABC's of telehealth in K-12

How many schools in your school district could

integrate within your hub, especially if you get E-rate money from the FCC grant program?

One of the healthcare challenges facing Sevier County School System in Tennessee was how to stop the spread of communicable illnesses that resulted in school closings. "In some winters, the flu could affect as many as 20 percent of 14,000 students, causing entire schools to shut down in an effort to slow the spread of the flu," explained on Don Best, Coordinator of School Health for the system.

In 2009, the system turned to telemedicine. They use video-conferencing hookups and USB-compatible devices for quick exams and recording vital signs. The telehealth platform comes from AMD Global Telemedicine. The County also made sure there would be a nurse for every school.

During a telemedicine visit, a child can be screened, monitored, examined, diagnosed, and treated for everything including ear infections, strep throat, and obesity. The school and Cherokee Health can easily track health and illness trends.



In eight years there have been over 11,000 telemedicine encounters, and they've gone five years without a school closure due to influenza. 84 percent of the students treated via telehealth remain in school.

Libraries – a quiet telehealth ally

Libraries reach out and touch virtually everyone in their communities across the entire economic spectrum. Libraries often have the [fastest broadband connections in the community](#).

Libraries can team up with healthcare providers in the hub to offer health and wellness knowledge as well as telehealth applications and services. Similar to companies that have healthcare providers schedule onsite telehealth services for employees, libraries could partner to offer these services to library patrons.

[Mobile Beacon](#) is a nonprofit that sells small WiFi transmitters called mobile hotspots to other nonprofit organizations. The hotspots have an average download speed of 8-12 Mbps, no data caps, and deliver Internet access to qualified low-income people. These hotspots work on the Sprint and T-Mobile LTE networks.



Libraries, the primary market Mobile Beacon sells to, loan these devices to their patrons for any time between several weeks to six or 12 months. Katherine Messier, Mobile Beacon's Executive Director, says, "Roughly 5% of our clients are healthcare organizations. Although it's a small percentage of our client base, 37% of these organizations use our broadband service in direct support of their patients."

Jefferson Rural Clinic in Jefferson City, TN uses the Mobile Beacon units. Their spokesperson states, "We are a free medical clinic with volunteers and one part-time person. We run this clinic for an entire year on about \$35,000. If we had to pay for Internet access at the going rates, it would be a minimum of \$1,500 a year."

VII. The foundation for a citywide or countywide network

Communities can offer a triple play of telehealth across a hub consisting of healthcare facilities, schools and libraries. This gives communities a firm foundation for expanding beyond the hub plus facilitates raising money for deployments.

Before the triple play, here are some deployment strategies that you may want to consider as you formulate your triple play strategy.

Ammon, ID – where a healthcare providers can be an ISP for \$10/month

The town of Ammon, ID did two things of note. They figured out how to build a network to a home for under \$40 a month, assuming the homeowner doesn't want to pay the entire \$3000 upfront. They also figured out how to get a hospital, a clinic, or any one to be an ISP on the network for \$10 a month.

[Read about the network particulars here.](#)

EntryPoint Networks software works with the Ammon network to let anyone on the network create a virtual private network (VPN) - a network without the physical, expensive hardware. "A person can have one VPN for telemedicine be isolated from another VPN for Public Safety or Education," says EntryPoint Networks' CEO Jeff Christianson.



A hospital could use encryption if they desired to add an additional layer of security. Healthcare providers, patients, doctors, or others can easily

produce content that creates an online-club atmosphere that's good for marketing.

New ways of thinking saves the day in Minnesota

One worry that many fiber network builders grapple with is that it takes several years to complete a network, and in the meantime communities can't generate revenue while the network is being built.



The RS Fiber co-op was formed to represent the communications interests of Minnesota cities in Renville and Sibley Counties. A fiber backbone links 10 towns and over 15 townships and fiber will run to individual premises. The original plan was expected to take three-to-five years to complete.

But rather than wait, the ISP Hiawatha Broadband Communications offered to build a 25 Mbps symmetrical wireless network in six months while simultaneously building the backbone. RS Fiber started to collect \$50,000-\$100,000 in monthly fees soon after the buildout started.

"We see telemedicine as being an 'anchor tenant' on a broadband network in this type of scenario," says Bender. "The main healthcare facilities running a range of telehealth applications and services increases the take-rate of wireless subscribers, which further helps the network owners by increasing the speed of their ROI. The simultaneous buildout of the backbone quickly gives the healthcare facilities a boost in broadband speed.

Bring it home with a new kind of broadband triple play

This last section addresses the triple play - aligning hospitals and healthcare institutions, schools and libraries into a healthcare hub. This infrastructure triple play can also become a fundraising triumvirate.

An engineering design team can create a wired and wireless infrastructure that links all three groups into a mini network and add a number of telemedicine applications and services. Then the community, via the local government, public utility, co-op, or a public private partnership that constructs and operates the network, can apply for the FCC's E-rate reimburses fund (libraries and schools). The FCC's \$400 million Healthcare Connect goes to healthcare facilities.

Those pursuing E-rate have to front the buildout costs. Libraries and schools can amortize their contribution to the network over four years. If the project costs one million dollars, for example, and E-rate reimburses \$900,000 of the buildout cost, libraries and schools would pay \$25,000 a year for four years.

The FCC can reimburse up to 90% of broadband infrastructure that facilitates school and library operations. Healthcare Connect subsidizes healthcare providers in rural areas for highspeed broadband connectivity, telecommunication services, and new construction. The FCC can pay up to 65% of the project cost; the community has to provide matching grants.

The North Carolina Telehealth Network, New England Telehealth Consortium, Colorado Telehealth Network, California Telehealth Network, and Health Information Exchange of Montana received funds. "They're a great way to aggregate resources, share network capacity and lower the cost for participants," says Windhausen. "More states should pursue these consortia, especially in rural areas where telemedicine can help to mitigate the damage from rural hospitals closure."

There are several other federal agencies with funds devoted to broadband, including the Department of Agriculture's Rural Utilities

Service (RUS). RUS is well known for its large loan program that helps entities build broadband networks. They also have the [Distance Learning and Telemedicine](#) grant program devoted to areas that already have broadband.

Keith Adams, an Assistant Administrator for RUS, says, "This fund is just under \$30 million and applicants tend to be evenly split between distance learning and telemedicine. We get a lot of requests to fund video and telecom equipment, computer hardware, software, and training." Adams warns that unfortunately a number of groups lose their funding because they don't have the proper resources in place to make use of the money. You have to have more than the technology.

Look to private-sector funding

If a community does its due diligence and advances a strong business case for these healthcare hubs, the triple play should open up various additional opportunities for funding, even if the community doesn't receive FCC or other agencies' funds.

"It's difficult to determine what public funds will be available, but there is an increasing amount of private investment dollars available," says Steve Smith, Founding Partner at Ronin Technology Advisors. "If a community can outline the long-term broadband goals and capabilities the community needs, then they are in a much better position for public-private partnership arrangements, as well as getting incumbent providers to upgrade their existing services."

[National Community Development Services, Inc. \(NCDS\)](#) specializes in economic development fundraising. As Danville, VA, and other communities have shown - if you build a stellar reputation for having premier healthcare services, you will drive new companies and organizations to your community.

NCDS president Tom DiFiore believes, "The initiative must be relevant to the community's needs and opportunities; there must be measurable goals that define progress and success; and the leaders of the initiative

must be accountable to the investors. Key stakeholders and funders must have a sense of ownership in the initiative being funded." Telemedicine and broadband can be that goal.

Remember, funders pay for benefits a particular technology product or service delivers, not necessarily for the technology. People may not know a gigabit from a giraffe, but they will pay for a broadband that enables an elderly parent to stay safely in her home, or people working two or three jobs to have video check ups.

About the author:



Craig Settles is a business strategist and industry analyst who helps communities implement broadband technology that improves healthcare delivery; boost local economies, transform education, and increase local government efficiency.

Besides a service that's based on 30 years of experience, Mr. Settles' website overflows with broadband knowledge: over 200 hours of radio interviews, dozens of blog posts, in-depth reports on hot broadband topics, a link to his book, [Building the Gigabit City](#) and other resources. [Check it today](#). Connect with Mr. Settles on [Twitter](#) and [LinkedIn](#).



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