

A View From the Summit

At the 2017 **BROADBAND COMMUNITIES** Summit, held in Dallas in May, fiber deployers shared their experiences and vendors displayed their new technology.

A BBC Staff Report

Open Access in Local, State and MDU Networks

In the United States, most broadband networks are vertically integrated: The entity that builds and owns a network delivers services to that network's customers. Or, if the network owner is not an experienced service provider, it delegates that task to a hand-picked partner.

But there have always been exceptions to the rule. Some network owners, private and public, believe strongly that their customers should have a choice of service providers, and they make their networks "open access." Some are legally bound to allow multiple providers to use their networks. In a few cases, network owners both support open access *and* are required to provide it. In general, open access is more successful when network owners embrace the concept than when it is forced upon them.

Both voluntary and involuntary open-access networks have become more common in the last few years. As a result, network owners have experimented with a variety of arrangements and learned more about what makes open access succeed or fail.

In Summit 2017, a number of sessions touched directly or indirectly on issues of open access. Following are highlights of the discussions of this topic.

MUNICIPAL NETWORKS

Andrew Cohill, a consultant with long experience in planning, designing and operating open-access networks, explained that because open access enables providers to share infrastructure, it promotes competition and

choice while saving construction costs. "It's not a socialist plot to destroy the economy," he quipped, adding that incumbent providers could actually benefit by joining open-access networks.

Cohill said open-access networks are less likely than other municipal networks to attract political opposition: "To my knowledge, no open-access network has ever been sued. Open access deflects complaints to legislators." That's because open-access networks are similar in concept to roads and other basic infrastructure that communities build and private companies use.

Brit Fontenot of the city of Bozeman, Montana, listed some of the benefits an open-access network had brought to Bozeman. The city created Bozeman Fiber as a not-for-profit agency to run the network, and retail service providers offer services on it. Because there is no capital barrier to entry for providers, they compete on price and quality. Customers can obtain higher speeds at lower costs, along with better service and redundancy.

The Kitsap Public Utility District (KPUD) in Kitsap County, Washington, is obliged by state law to offer open access to service providers. After connecting schools, libraries, government offices, first responder buildings and major medical facilities with fiber, KPUD is embarking on a project to build fiber to all homes in the district. Paul Avis, the superintendent of telecom, said the district would expand its network "by any means necessary." He added, "Just the threat of KPUD providing fiber has caused incumbents to



Proponents of open access shared their stories.

start stringing fiber. If we just get the broadband, that's a win."

Rio Blanco County, Colorado, recently launched its FTTH network. Blake Mobley, the county IT director, said the open-access network benefited service providers – they grew faster, hired more local staff, gained more customers and, of course, didn't have to invest their own capital. In addition, customers gained more choices.

Mobley added, "One advantage of open access is that we could set aside half the data centers for the public anchor institutions to use. They can back up their data in a different town. For us, open access means opening the network not just to the ISPs but also to the community. We've designed extra room on the towers for emergency services and added a zone for FirstNET."

Bjorn Wannman of COS Systems, which develops software for managing open-access systems, noted that there are open-access systems throughout Sweden and that many service providers there operate in multiple cities. "My vision is that an ISP can be a local provider in each place," he said. One of those Swedish ISPs, before being bought out, was owned by Ventura Next; Robert Gure, sales manager for Ventura, noted that he now found it "strange to see three people pulling fiber into the same building" in countries where open access was not the norm.

HOW MANY PROVIDERS?

The number of providers on an open-access network tends to increase over time. Rio Blanco County has two providers (but may add more in the future if demand permits) and Bozeman Fiber has three; the KPUD backbone is used by about 15 providers. Roger

Timmerman, CEO of UTOPIA, a Utah open-access network, said that UTOPIA – an early FTTH deployment – now has nine residential providers and 25 business providers and plans to expand into additional cities and counties that are not part of the network ownership group. Customers benefit from the competition, he said, and providers will benefit from the ability to sell their service in more cities, in the same way as the Swedish ISPs Wannman described.

Cohill pointed out that if a small community wants video service, it might have to grant exclusive rights to an IPTV provider for a limited period. "Generally, you won't get competition in television unless there are several thousand homes passed," he said. The same applies to other specialized services beyond internet access and phone service.

COOPERATION AMONG STATE AND LOCAL NETWORKS

MERIT Network, a Michigan statewide research and education network, is obliged by the terms of its BTOP grant awards to provide open access – but it adopted open access as a guiding principle long before receiving those grants. Elwood Downing, vice president,

explained, "In my 23 years at MERIT, I didn't realize till BTOP that we were doing open access." MERIT provides a wide variety of choices for access: long-term and short-term fiber leases, colocation, overlashing, 1 Gbps and 10 Gbps transport services, and Ethernet services up to 1 Gbps. Eleven for-profit entities, including two ILECs, purchase wholesale access from the network today.

Allband Communications, a small telephone cooperative in an extremely rural area of Michigan, is one of many that depend on MERIT for backhaul. Ron Siegel, Allband's general manager, praised MERIT's competitive rates and especially its collaborative approach. He said, "MERIT has been critical for us. Originally we had 3 Mbps backhaul – two T1 lines – and then we tied into MERIT. Now, we're getting 100 Mbps symmetrical. We added the town of Mikado [as a CLEC territory] because we could get reasonable backhaul from MERIT, and we're helping other communities get started with broadband. I don't know what I'd be doing without MERIT's open access."

The town of Holland, Michigan, operates an open-access fiber network on which six providers offer services –



State and local networks collaborate in Michigan.

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KEEPING SCORE IN THE GAME OF GIGS

An attendee reflects on the Summit's lessons for communities that aim for gigabit broadband.

By Rollie Cole, *Sagamore Institute of Policy Research*

THE GAME IS AFOOT!

The hopes and dreams expressed in the early **BROADBAND COMMUNITIES** conferences have given way to the data and stories of Summit 2017. Ammon, Idaho, has already commissioned Strategic Networks Group to prepare a report on the value generated by the Ammon Fiber Network, and another consulting firm is seeking sponsors to do the same for community networks in Maine. Because so many towns now have robust broadband, there are data and stories to guide people going forward.

THE GAME IS UNUSUALLY DISTRIBUTED

Most patterns of technology dissemination, including telephone and electricity, proceeded from the center out. Big cities adopted technologies before small towns before rural areas; the rich adopted them before the middle-class before the poor, and so forth. The “game of gigs” is *not* following this pattern. There are spots of FTTH in all sorts of places and a lack of FTTH among many of the usual suspects.

Some relatively small towns and even rural areas served by electric or telephone co-ops or by local governments are rolling out (or have already rolled out) FTTH way ahead of larger cities. Though some rollouts are in developments that house high-income or high-wealth residents, many are not. College students, who often have little or no income of their own, are a leading sector, as are senior communities that often have a mix of incomes and wealth, and even public housing, which is entirely low-income, zero-wealth.

The “sweet spot” for a balance of financial cost, political hassle and take rates is often the demographic group just above the poverty level. These residents will pay for internet access, but they live in small homes on small lots close to one another. These neighborhoods are lower-cost and lower-hassle environments than subdivisions with large homes on large lots, which have procedural and undergrounding requirements, or older multiple-dwelling-unit (MDU) properties, which have problems with retrofitting and deals already made with building owners.

THE PLAYERS ARE CHANGING

Players of many backgrounds – telcos both big and small, cablecos both big and small, utilities of all types (electricity, voice, even water!) – and of many types of ownership (municipal, private, cooperative) are becoming involved in FTTH. There are new patterns

of bundling and unbundling among the players. Some FTTH deployments are vertically integrated and becoming more so with more ownership of the physical items, more ownership of the content and so forth. Some FTTH deployments are less vertically integrated and trending to even less integration with open access and other use of physical facilities owned by others.

One highlight for me was Ed Balcerzak, senior vice president of commercial and connected communities at AT&T, telling multifamily property owners and developers, “AT&T’s job is to deliver better water; your job is to provide the plumbing.” Though he was urging owners to invest in infrastructure only within their properties, I could still imagine thousands of telephone engineers rolling over in their graves at this reversal of the traditional telephone company position.

NEW CIRCUMSTANCES, NEW BEHAVIORS

In their dealings with single-family homes, the major telcos and cablecos have shown a commitment to and a practice of more and more vertical integration. They own everything, they operate everything, they increasingly provide content and they have growing service portfolios. However, in dealing with MDUs (not just single-building properties but also multibuilding communities and even town-sized developments), they appear, along with their smaller competitors, much more willing to make unbundling moves in ways that are not consistent with their commitment to vertical integration in other contexts.

The pattern appears most clearly in wireless operations – all the majors seem willing to unbundle in various ways to ensure their wireless service has wider coverage and higher speed and reliability than it otherwise would.

BROADBAND IS BECOMING A UTILITY – MAYBE

Remote health care, the homework gap and smart-city projects are showing citizens and public officials the positive roles of robust broadband networks. More and more, connectivity is seen as akin to water, food and electricity – rather than as a luxury item for entertainment (although the market for more entertainment, and more types of entertainment, continues to grow).

At the same time, however, the debate over broadband provision pits those who feel robust broadband should be more like food, which



government rarely provides directly, against those who feel it should be like water, which governments often store and distribute. Although the number of those who say government should never be directly involved seems to be shrinking, many holdouts are state and federal legislators and officials.

EXPERIMENTS ARE UNDERWAY

In part because dissemination of this technology is so scattered and so unusual, there are actual experiments with all sorts of ideas. Bill St. Arnaud, formerly the chief research officer of the Canadian network CANARIE, once proposed that homeowners own their connections to the network backbone. Ammon is now doing something similar – the build from the street to the building is financed through a local improvement district that makes the costs of that connection an obligation of the building and part of the legal improvements to it.

Those who call for structural separation, especially separating the physical parts of a network from the services delivered over it, are trying many variants of open access. Some are explicit, as when municipal operators refrain from offering services, but most are implicit.

WIRELESS IS EVOLVING

Wireless technologies play two fixed roles and one mobile role. What we might call “big fixed wireless” serves in rural and urban areas to extend service to buildings that are impractical to connect with fiber. “Small fixed wireless” extends service from buildings to devices in or near them. As that technology gets better, many people call for substituting wireless for wired broadband, arguing that it will increase competition. (The fact that fiber is the most-used and fastest-growing backhaul technology from wireless points of access is often overlooked.)

Maybe laying all that fiber for wireless backhaul, often via third parties that include municipalities, cooperatives and others, will lead to FTTH deployment, as fiber will be so physically close to the premises at that point. [Editor’s note: This is already beginning to happen, and the

transition to NG-PON2 will accelerate the trend.] Maybe the lessons learned in placing and sharing towers and small-cell antennas will contribute to smoother processes for sharing poles, conduits and in-building facilities.

TECHNOLOGY IS GETTING FASTER, BETTER, CHEAPER AND SMALLER

Technology, including hardware, software, design and other factors, is improving rapidly. Placing and connecting physical elements (even if the connections are in part wireless) still has physical, economic, and social/political challenges, but technology advances help deal with them.

FEDERAL, STATE AND LOCAL ROLES ARE CHANGING

The federal role in broadband is likely to shrink in terms of regulation and stay the same in terms of dollars. That leaves the responsibility on local governments to innovate and an opportunity at the state level to encourage or discourage local innovation – in some cases with dollars, but in most cases by promoting or stopping restrictive legislation (though many speakers identified innovations at the local level even in states that had relatively restrictive legislation). In addition, the FCC’s Broadband Deployment Advisory Committee and others are charged with developing and promoting pro-innovation state legislation. One prediction was that the new lineup on the U.S. Supreme Court will be more sympathetic to increasing the role of states and less sympathetic to efforts, via preemption or otherwise, to decrease the role of states.

COMMUNITIES BUILD FOR THE FUTURE

Several speakers emphasized that communities are building for the future by leaving space for new infrastructure on poles, in conduits, on towers and on surfaces that could hold small-cell sites. Others are deploying new infrastructure that isn’t yet needed, especially dark fiber. Unlike excess capacity in, say, highway infrastructure, the marginal cost of these items tends to be quite low, the holding costs (financial and physical) tend to be quite low, and the probability that the excess capacity is in the right place and form quite high.

Electric co-ops that built networks for smart grids, cities that built networks for governmental services and schools that built networks for educational purposes all found the excess capacity valuable when the time was right to add new customers and new services. Though the excess fiber lines of the 1990s had to be sold at pennies on the dollar when demand did not materialize fast enough, no one seems to be having that problem today. The costs of marginal capacity are much, much cheaper than they were 20 years ago, and the demand is much, much higher. Even a senior Federal Reserve official, Jordana Barton, recommended this strategy when speaking at the Summit.

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and one of those providers is MERIT, which serves anchor institutions. (MERIT also uses Allband's infrastructure to serve its member institutions in that service area.) Pete Hoffswell, broadband services manager for the Holland Board of Public Works, said, "I can specialize as an infrastructure provider at what we are really good at – providing connectivity – and leave services to other people."

Currently, Holland's fiber is fairly limited and expensive, and there are only about 225 private customers, mostly businesses. In a new project that will make fiber connectivity more generally accessible – and less expensive – in the downtown area, the utility will start off as the provider of last resort to ensure that everyone can access service. Other ISPs will be allowed to offer services as well.

Hoffswell anticipated that the Holland network will have great opportunities as a backhaul provider for 5G wireless networks and for the internet of things. "This is where an open network can be awesome," he said.

OPEN ACCESS FOR MDU

In multiple-dwelling-unit (MDU) properties, provider choice is relatively unusual, and true network sharing – as opposed to parallel networks in a single building – is even more unusual. There are some successful instances of voluntary open access, however. Givens Communities, a nonprofit that owns several senior communities in North Carolina (and was featured in a recent Property of the Month article in **BROADBAND COMMUNITIES**), is committed to offering residents a choice of providers. Offering high-quality communications services and giving residents a choice of services supports Givens' vision of "expanding the possibilities for aging."

At the Summit, Ricky Foor, the technology director for Givens Communities, described its recent implementation of an FTTH network at Givens Gerber Park, a low- and moderate-income senior community. Givens owns the network and uses it to provide internet service to residents;

it also makes the network available to a cable provider, which offers internet service using RFoG technology. (Givens also resells the cable provider's pay TV service.) About three-quarters of the residents select the Givens service. The experiment worked well enough that Givens plans to replicate it at other communities in the future.

THE SAN FRANCISCO ORDINANCE

In San Francisco, a recent city ordinance threatens to impose an involuntary form of open access in some MDU properties: If a resident wants to subscribe to a provider's services, that provider can serve the resident by using existing inside wiring owned by the property owner, with compensation. The ordinance, whose goal is to increase provider choice for residents, is supported by some competitive providers (such as Google Fiber) and opposed by others (such as many private cable operators). Owners generally feel the ordinance is a blunt instrument. A lively but inconclusive discussion, summarized below, took place at the Summit:



Bill Dodd,
GigaMonster

Bill Dodd, GigaMonster:

We often have to overbuild cabling to carry the kind of bandwidth and programming we want to deliver.

Our greatest challenge is being able to

figure out how to do that and then negotiate access to run that path. Service providers don't play nicely with each other in telecom closets, so using our own wiring is very important. The anticompetitive practice of disconnecting home runs is very frustrating and costs us money – the real victim is the consumer – and it's easy to cut off someone's service even without intending to.

There are many forms of legal agreements to give exclusive use of wiring, so we have to overcome contracting issues. But regulation is a

more difficult way to do it. Government regulation should not be the tool for negotiating access. Regulation should not take away property rights. ... [This is] a really bad path that would prevent companies such as ours from being able to justify an investment because we wouldn't know how many other providers would come in and take possession of the wiring.



Michael Purdy,
Google Fiber

Michael Purdy, Google Fiber:

Contractual provisions often make it difficult for us to enter a building, and these provisions disincentivize owners from bringing in

competitors. In our view, if you're actually using a wire, you should have the right to it. Once usage of the wire is discontinued, we support competitive usage of it.



Scott Casey, EdR

Scott Casey, EdR:

EdR [an owner of student housing] purchased all the infrastructure from its providers in 2009. We wanted control over the infrastructure and the ability to change providers.

We're trying to satisfy difficult residents. The carrier in a building has the right to be there, but if we terminate it, we want to bring in someone else. All our buildings have bulk services, and if we're not getting good service, we can change providers.



Steve Sadler,
RealPage

Steve Sadler, RealPage:

In the luxury space, most owners want to own and control the wiring so they can offer competitive choices to residents. Access

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agreements will never go away. Providers need to be able to operate their systems. Owners need to be able to control quality. There's only so much space in a building. However, the economics of access agreements will change over time.

SHARED USE

Sadler: Shared use and co-use are not as onerous as they might sound. Typically, all an owner owns and can share is the inside wiring within units. It's not unusual for that to be shared today, depending on what the resident wants. I seriously doubt that the wiring from an apartment to the street and beyond would be shared. Service providers are unlikely to build their own networks (especially a third one in a building) for economic reasons.

Purdy: Lots of protections for property owners are listed in the ordinance. It doesn't make sense for competitive providers to go into a building if there's no return on investment. You won't get six or seven providers in a building. The point of the ordinance is to reduce

barriers to entry to serve demand that is otherwise unserved.

Casey: We have nothing but bulk service. We build class A properties and identify revenue opportunity spaces inside the building, so the telecom closets are small. If I have multiple providers, how do I prevent someone from unplugging someone else? Residents will be confused; they're paying for service as part of the rent and expect it to be there. We're not going to exempt them from bulk service. We do competitive bids when we build properties, and we get the best provider with the lowest price. We wouldn't let someone come in and put different shingles on a building, so why should we let someone come in and offer different service? We're already giving great service.

Purdy: It's not likely that an individual would want to pay twice, and it makes no sense for a provider to serve onesies and twosies, so no one is going to come into a bulk-service building! In our view, the market in San Francisco was

failing because many people had no access or only one provider. We're not trying to circumvent agreements.

INNOVATION AND UNDERSERVED POPULATIONS

Sadler: I don't really see that the regulation will have any impact on innovation. Providers are already innovating on a nationwide scale. I think it's easier if an owner owns all the infrastructure; the owner should build out fiber to the unit and grant access to any provider. We've come way too far to be still dealing with these silly infrastructure issues. But I don't think this regulation is going to drive innovation; it will drive courtroom visits.

Dodd: Not many service providers are serving low-income communities. To serve the underserved, it's necessary to create a profitable business environment for the providers. We're struggling to make money even in luxury housing. So rather than regulation, the solution is to work with the owners. Find out what's keeping providers from coming in and what can be done about it.

Vendors Are Ready for Mixed Access Networks

Most Summit exhibitors focused on the needs of networks that combine copper, coax, wireless and fiber. They showed new management software, deployment tools and hardware that featured the new look.

Distributors such as AMT, Graybar, Walker and Associates, Power & Tel, Toner Cable Equipment and DF Countryman and engineering firms such as BHC Rhodes, Finley Engineering, KLJ Engineering, Vantage Point Solutions and Henkels & McCoy, all of which have broad experience in a wide range of network technologies, said they were spending a lot of time explaining options to MDU owners, managers and consultants.

Equipment vendors, such as Champion ONE, ProLabs USA and Nokia, are all broadening their offerings.

Providers of network management services, such as ServerPlus, Ooma and IPiFony (for telephony), National



Wi-Fi and Spot On (managed wireless), National Information Solutions Cooperative and Kadirnet, admit that not all network technologies can be managed from a single screen – yet they are not far from being able to do just that. ADTRAN, a hardware company that is evolving into a software company that does hardware, is close as well.

On the software side, Advance Fiber Optics offered new twists to its MapInfo and Esri-based OSPI Insight, with versatile data dashboards that interface with everything from Google Maps to bookkeeping software. VETRO FiberMap concentrates on FTTx but in every conceivable iteration. New Light Technologies has evolved its Utility LINE system for asset management, and 3-GIS keeps adding functionality to its web-based management and asset tracking.

GLDS, Innovative Systems, Freeside Internet Services and ETI Software Solutions are all network agnostic.

Fiber is behind all the networks, but whether the fiber terminates in customer premises, in the basement at a G.fast or DOCSIS node, in an equipment closet mating with Cat 5 or Cat 6 cable, or on a rooftop connection to point-to-point wireless, these vendors have your back.

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AFL continues to cram more fibers into its LM series cable. The LM200 cable tops out at 432 strands yet fits easily into a 13 mm (1/2 inch) microduct. It is actually smaller than the LM's previous high-count, 288-strand cable. The new LM200 product design integrates the latest technology, 200 μ m buffered single-mode fiber, which allows for reduced diameter cables. This series uses gel-filled buffer tubes containing multiple 12-fiber sets of color-coded fibers. Each set is grouped using dual color-coded binder threads. The dry-blocked core is made up of six buffer tubes SZ-stranded around a central strength member.



Many vendors showed polymer conduit – typically high-density polyethylene (HDPE) – and MaxCell showed fabric ducts with real-world, mixed-technology deployment examples. These pictures show Blue Diamond Industries conduit for fiber optic cable networks that need ducts-within-ducts (1/2 inch to 6 inches in diameter) and extra armoring. Options include prelubrication, preinstalled pull tape, preinstalled cable-in-conduit and a toneable wire.

Huawei, like Calix and others, produces rugged, compact, mount-anywhere DOCSIS nodes.



~ Additional Summit coverage will appear in the July 2017 issue. ~



Need what amounts to a handhole that can handle anything? Clearfield hears you. The company makes (among other things) a wide range of vaults and pedestals, but this one stands a bit apart from the rest of the line.

American Polywater has a new lube in a new bottle for pushing or pulling fiber – the quart bottle is for spray-on or wipe-on application of thin-film lubricant.



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