What Every County Commissioner Needs to Know About Broadband

Overview

Telecommunications can be an incredibly technical and oftentimes daunting topic area for local elected officials. While most everyone recognizes and talks generally about the importance of adequate telecommunication service and online access capabilities, many county commissioners do not know how to frame the discussion and work to ensure that their communities have adequate levels of service.

Rural communities in particular have had difficulty securing adequate telecommunications infrastructure that is affordable, accessible and redundant. It has become obvious to most rural leaders that deferring to private industry or "leaving it up to the market" is not a course of action likely to result in better service, and that more direct involvement is needed at the local level.

Accordingly, concerned stakeholders need to have a baseline understanding as to how the industry has evolved and currently works in order to have any measure of success in improving local broadband access. The goal of this white paper is to familiarize county commissioners and staff with the issue of broadband access in order to better empower them to engage in the dialogue and ultimately bring essential infrastructure to their communities.

> **BROADBAND FACT: By 2016, the gigabyte equivalent of all movies ever made will cross global IP networks every 3 minutes.**

What Is Broadband?

To really understand what "broadband" is, it helps to understand how the technology has evolved. In the past, there were multiple networks in existence; telephone networks that connected telephones; cable television networks that broadcast TV signals over coaxial cables connected to set-top boxes; and wireless networks that connected telephones (with radios inside that permitted users to move around while talking). All these networks were distinct from one another and had a defined customer base.

In the early 1990s all of this began to change with the rise of the Internet. The key thing to understand about the Internet is that it created a means for completely separate networks to begin talking to one another. Telephone networks could talk to cable networks which could talk to wireless networks and so on.

It was a bridge builder and led to massive innovation that is still happening today. At the same time, it began to break down the barriers between traditional regulation and traditional business models in the industry. Each type of network faced competition from the other now as newer technologies spread and became more affordable. Thus the cable television providers started to provide telephone voice service using Internet technologies while the telephone networks used those same technologies to start providing content, and so on.

What resulted was eventually massive consolidation in the cable television, telephone and wireless telephone industries because they were no longer providing separate products. Each became commoditized transport companies carrying bits to and from devices like smart phones, tablets and laptop computers – devices that have all but replaced traditional telephones and are now on track to replace the traditional television distribution models.

Along the way, industry experts coined the term "broadband" (shorthand for "broad bandwidth") to describe this high-speed commoditized access to networks. Consumers today care less today about telephone calls or cable television channels and more about the ability to connect to other devices through other networks. Thus landline telephones might call a computer because the user has a Skype or Vonage account and calls to cellular telephones – an expensive rarity in the 1980s – are now commonplace. Meanwhile, cellular telephones are not telephones at all anymore; they are mini computers that allow users to access email, text, Facebook, Twitter, Skype, and even real time 2-way video such as Apple's Facetime service. Voice, once the driver of the communications industry, is now merely a software application in the eyes of the younger generations.

Broadband can be provided through a wide range of delivery technologies. These technologies typically utilize wires or fiber optic cables (which are either buried or deployed on poles) or fixed or mobile wireless (which is provided by transmission towers). Broadband also ensures a connection to the Internet that is constant and does not have to be reestablished each time the user goes online.

Finally, broadband implies a certain threshold capacity for data transmission, basically dictating how much data can be sent by or received through your Internet connection. This means that all transmissions, from text to audio and video, are broken down and then sent and received as "bits" of data. Internet speed is then measured in units called "bits per second" (bps). The U.S. Federal Communications Commission

(FCC) defines basic broadband as transmission speeds of at least four megabits per second (Mbps), or 4,000,000 bits per second, downstream (from the Internet to the user's computer) and one megabit per second upstream (from the user's computer to the Internet). However, in recent proceedings the FCC has begun to question whether higher speeds are necessary for a robust communications infrastructure.

> **BROADBAND FACT: Currently, there are THREE TIMES as many devices connected to IP networks as there are people in the world.**

Why Is Broadband Important To Rural Communities?

It is not an understatement to say that broadband is absolutely **critical** to local economic development efforts. In order to compete in today's global economy, high-speed Internet access is an absolute necessity for all manner of businesses. Moreover, the availability of broadband improves the quality of life and desirability of a community by giving residents access to educational opportunities and enhanced healthcare. These are important factors when potential homebuyers or businesses are looking to relocate to an area. A growing number of industry analysts are even calling Internet infrastructure "The Fourth Utility," elevating broadband access to the same level of importance as roadways, water systems and power grids.

The availability of broadband in an area can help achieve a wide number of community goals, including:

Economic Development. Businesses of all shapes and sizes utilize the Internet to some degree, and a strong local economy is dependent upon robust broadband capacity. In rural areas, broadband gives entrepreneurs and small business owners the opportunity to compete alongside large corporations by increasing productivity and efficiency and allowing location independent businesses to thrive anywhere.

Telecommute Opportunities. Emerging location-neutral business opportunities allow for unique economic development and allow for location-neutral employees who often earn higher wages. Telecommuting also saves companies and organizations money by letting employees work remotely, thereby avoiding long commutes.

Education. Broadband affords citizens in rural areas the opportunity to participate in online learning and distance education opportunities for both K-12 and college. It also allows students to

 take advantage of enhanced online curriculum offerings.

Healthcare. Connecting patients in remote areas to healthcare services via telemedicine and allowing providers to utilize electronic medical records (EMR).

Government Services. Making government services and information readily available to citizens by saving a drive to government offices during business hours and creating more consumer convenience.

Social Interaction/Entertainment. Allowing friends and families to stay better connected with one another through photos and videos uploads to platforms like YouTube and Facebook. Broadband also allows users to download movies and music.

> **BROADBAND FACT: Global IP traffic has increased eightfold over the past five years, and will increase threefold again over the next five years.**

What Is The Role of County Commissioners In Providing Rural Broadband Access?

While the provision of broadband is not a service that counties are statutorily tasked with, there is an active role that county commissioners and staff can take in trying to bring high speed Internet infrastructure to their communities.   In most communities, county commissioners are considered the "hub in the wheel" when it comes to establishing collaborative partnerships with state and federal governmental agencies, the not-for-profit community and the private sector. Commissioners also participate in policy discussions and lobbying efforts and engage in infrastructure planning efforts that oftentimes intersect with broadband issues. These kinds of activities can be essential in the effort to secure reliable broadband access.

Facilitator/Collaborative Partnerships. County Commissioners are regular participants in conversations and deliberations over the siting of communication infrastructure – especially towers (which can provide wireless broadband). And while rights of way are regulated at the local, state or federal level, county commissioners are still important policy-makers who can help the government open up the single most

expensive component of any landline broadband communications systems – the cost of laying conduit that carries fiber optic cable along public rights of way.

While cellular towers can be controversial, the establishment of these towers will be important to the provision of cellular telephone communication – a sector that is growing by leaps and bounds – as well as for cellular broadband (NOTE: while the cellular industry claims that cellular broadband is competitive with landline broadband, industry analysts maintain that landline fiber optic has far greater capacity).

Commissioners also have established working relationships with Colorado Department of Transportation (CDOT) staff, and are the logical facilitators for conversations involving using rights-of-way (on both CDOT highways and county roads) to bury cable. If anything, opening up CDOT rights of way could have tremendous impact on rural broadband, particularly in the very difficult sectors that involve long haul connections back into metropolitan Internet exchange points (such as those in Denver, Albuquerque and Salt Lake City).

Legislative Advocacy and Rule-Making. As local leaders, county commissioners regularly weigh in on policy-making efforts at the State Capitol and in Congress. Rule-making by a variety of state agencies and the Public Utilities Commission (PUC) require commissioner attention as well. As the vast majority of state legislators come from urban areas, there is an increasing need for educating members of the General Assembly about the "digital divide" that exists in rural Colorado. Staying involved with groups like CCI, Club 20, Action 22 and Progressive 15 can help commissioners stay apprised of legislation that could have an impact on rural broadband and other telecommunication issues. Club 20, Action 22 and Progressive 15 have all adopted 'Telecommunications Principles' to guide decision-making at the local level. Deregulation of the telecommunications industry (which began in the mid-90's) continues today at both the state and federal level, and may have implications for future broadband service delivery.

Local Technology Planning Teams. The Governor's Office of Information Technology (OIT) has been working with local stakeholders to create Local Technology Planning Teams (LTPTs) around the state, and a number of county commissioners are currently serving on these teams. These teams understand technological availability, the local economy and the political dynamics of the region. LTPTs have been working in the various regions to identify and address the gaps in broadband services and come up with

local solutions and aggregate both demand and available resources.
http://www.colorado.gov/cs/Satellite/OIT-StateInitiatives/CBON/1251575390656.

Colorado Broadband Knights of the Roundtable. Also facilitated by OIT, this group is a collection of Local
Technology Planning Teams, statewide broadband efforts, local and state government representatives and
other community interests whose goal is to develop and facilitate a comprehensive, statewide broadband
strategy.   The collaborative group has identified five key priorities related to broadband strategy and is
actively working on tangible solutions. The five key elements are:

1. Engage Local Communities
2. Coordinate and Collaborate between Broadband Activities
3. Leverage Funding Opportunities
4. Evaluate and Support Critical Broadband Policy
5. Achieve Digital Literacy

Five Broadband Questions Every Commissioner Should Be Asking

1) **What is the current average download/upload capacity in our county?** The State of Colorado
   maintains a map showing advertised download/upload speeds around the state. The map is a useful
   tool, allowing the user to isolate his/her search by county if needed.   However, much of the data in the
   map is based on vendor reporting and may or may not be completely accurate. You can access the map
   at http://maps.co.gov/coloradobroadband/. This website also features an online Internet speed test
   with which you can test and verify the upload/download speed of the Internet connections in your
   county.

   Understanding the speed of a connection is only a part of the equation, though. It is also critically
   important to understand what *technologies* are providing that bandwidth and speed. In other words, you
   need to understand the underlying physical transport – is it wireless, fiber optic, copper or coaxial? If it
   is wireless, is it terrestrial or satellite? While the latter may have great coverage, there are simple physical
   characteristics that render certain technologies unsuitable for real time voice, data or telepresence. Each
   type of system has its strengths and weaknesses; each needs to be assessed in light of local needs,
   capabilities, and constraints.

2) **What are the key institutions in the county and what are their service needs?** It is important to identify key institutions (schools, colleges, hospitals, libraries, local governments, etc.) and determine both their existing broadband capabilities and service needs going forward. As you assess how to proceed, can you create successful public-private partnerships with local providers who have proven to be reliable community partners? Or are you in a situation where the local providers need to be encouraged to more aggressively deploy the latest technologies?

3) **Who are the key telecommunication providers in the county/region? And what is the best way to talk to these providers?** Most areas of the state have a mixture of local providers as well as larger statewide carriers (CenturyLink, Verizon, etc.). Understanding what services these different carriers provide (phone, video, Internet, etc.), their service areas and the costs of coverage is critical not only to gaining an understanding of the broadband potential in your community but to ensuring that your area is adequately and sustainably served.

4) **What are the needs of business and industry in your county?** Each business owner has a unique set of needs and these will drive varying Internet capacity needs (both upstream and downstream). These might include video conferencing, virtual private networks (VPNs), voice over Internet protocol (VoIP), ability to share schematics (some in 3D), and traditional online needs like credit card and payroll processing. Economic development groups have identified broadband infrastructure and services as an essential component in the Colorado Blueprint.
http://www.colorado.gov/cs/Satellite?c=Page&childpagename=OEDIT%2FOEDITLayout&cid=1251595201237&pagename=OEDITWrapper

5) **Is your network "future-proof?"** Given the rapidly evolving technical advancements in the high-tech industry, it is difficult to predict what the "next big thing" is going to be. Planning for enhanced future capacity and adaptability is absolutely essential to the long term success of your local economic development efforts.

Conclusion

County commissioners are key players in local economic and community development efforts, and as such, have a logical role to play in the procurement of broadband infrastructure in their communities. Telecommunications service that is affordable, accessible and redundant remains elusive in many rural areas of the state, but the challenge is not insurmountable. By building on successful past efforts with state, federal, non-profit and private industry partners, commissioners can successfully bridge the digital divide and help secure the kind of broadband infrastructure that is critical for future economic development in Colorado's communities.

Glossary

Broadband: broadband comes from the words "broad bandwidth" and is used to describe a high-speed connection to the Internet. A broadband connection lets you instantly connect to the Internet or your corporate network at speeds many times faster than a dial-up connection.

Bandwidth: bandwidth refers to how fast data flows through the path that it travels to your computer; it's usually measured in kilobits, megabits or gigabits per second

DSL: stands for digital subscriber line; it refers to the type of broadband connection that brings information to homes and businesses over ordinary copper telephone lines

Cable modem: refers to the type of broadband connection that brings information to homes and businesses over ordinary television cable lines

Satellite: refers to the type of broadband connection where information is sent from and arrives at a computer through satellite dishes

Wireless: refers to the type of broadband connection where information is sent from and arrives at a computer through transmission towers

Downstream speed: refers to the speed at which data flows from the information server to your computer

Upstream speed: refers to the speed at which data flows from your computer to the information server

Kbps: Stands for Kilobits per second, or thousands of bits per second. For example, most analog modems transmit at 56 Kbps or 28.8 Kbps.

Mbps: Stands for Megabits per second, or millions of bits per second. This is a measurement of how much data can be transmitted through a connection. For example, 6.0 Mbps is 200 times faster than a 28.8 Kbps analog modem.

(Source: Broadband 101: The Unofficial Dictionary, produced by Nevada County, California)