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## Broadband as an Economic Development Tool

by Pat Murdo, Legislative Research Analyst

This briefing paper provides some background information on broadband's status in Montana, including players in the industry, types of services offered, and locations of the services. Whenever possible, information is provided on costs as well as the distribution of certain federal grants. A final section notes where the state may take action to increase either access or affordability.

### What Is Broadband?

Wikipedia's definition of the term *broadband* describes a "wide bandwidth data transmission with an ability to simultaneously transport multiple signals and traffic types. The medium can be coaxial cable, optical fiber, twisted pair, as well as wireless broadband (wireless broadband includes mobile broadband and the use of microwave transmissions)."<sup>1</sup>

As used in this paper, broadband is not the same as telecommunications, which 69-3-803(13), MCA, defines as "the transmission, between or among points specified by the user, of information of the user's choosing without a change in the form or content of the information upon receipt." In general, telecommunications refers to voice transmission in any format, while broadband covers data transmissions. Although the state has a role in voice transmissions, the Federal Communications Commission has preempted local control by saying that broadband by its very nature involves interstate commerce.

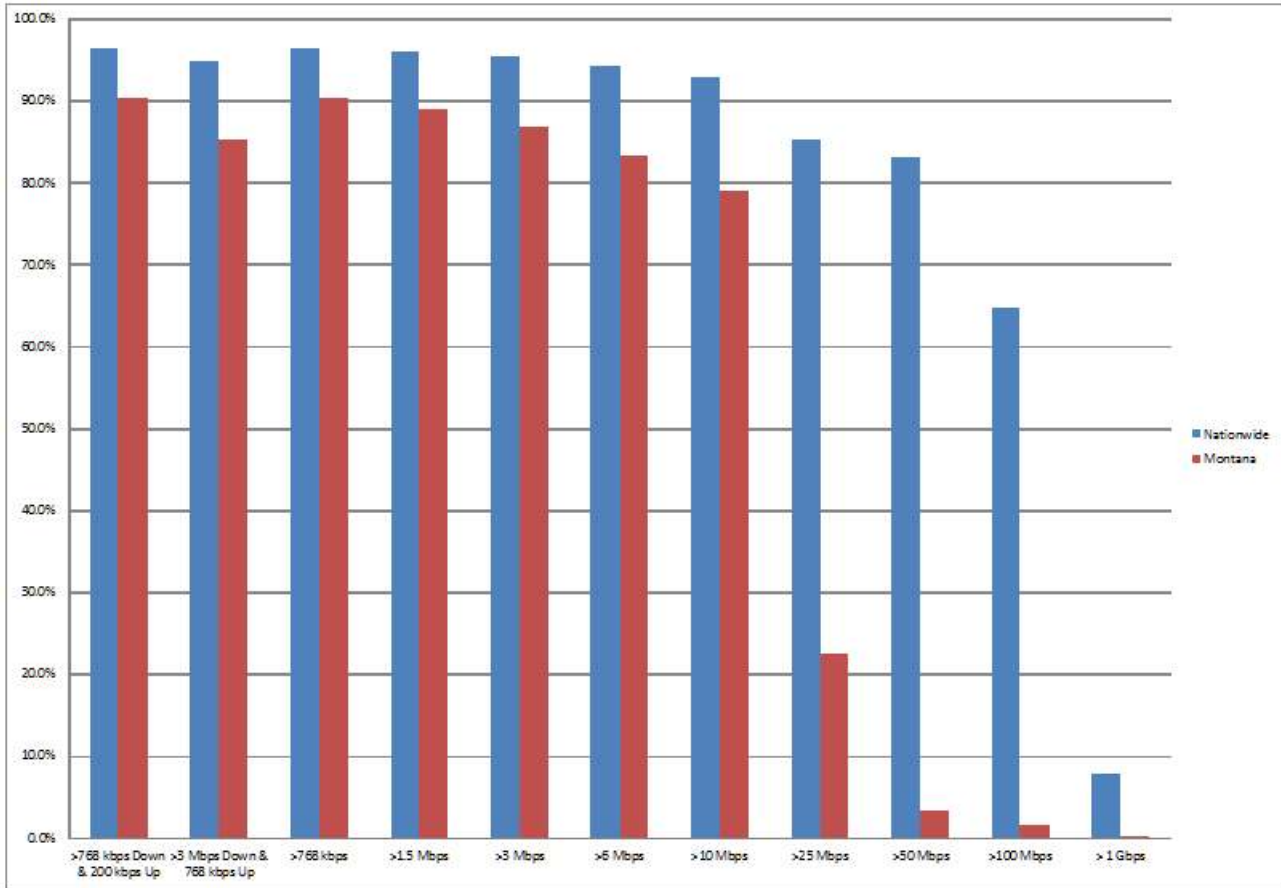
### Who Regulates Broadband?

Regulation of broadband is primarily by the federal government. However, because certain telecommunications companies offer broadband, some state filings are required for these telecommunications firms, which must register with the Public Service Commission. The PSC has a further role under 69-3-840, MCA, to designate as "eligible telecommunications carriers" those providers that want to receive federal or state universal service support. These service funds, accumulated through taxes on telecommunications services, are used to make certain that hard-to-cover areas have telecommunications access. Eligibility for high-cost support has a broadband component; as a consequence, while a telecommunications carrier does not have to offer broadband, most designated as eligible telecommunications carriers do offer broadband to receive the high-cost support funds.

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<sup>1</sup>The information was accessed Aug. 11, 2015, at <https://en.wikipedia.org/wiki/Broadband>.

**Figure 1: Wireline Download Speeds Accessible by % of Population Nationally and in Montana\***



\*Information compiled from the National Broadband Map by Phil Grate at CenturyLink.

### What are the Key Aspects for Economic Development?

Both access to a broadband provider and affordability are key to businesses that plan to use the Internet. In early 2015, the FCC updated its "broadband benchmark speeds" to 25 megabits per second (Mbps) for downloads and 3 Mbps for uploads. This replaced the 4 Mbps/1 Mbps standard set in 2010 by the FCC. See the chart below for a comparison of broadband speed availability nationwide with that in Montana. Data from the FCC indicate that 87% of Montana's population lacked access in 2014 to downloads of greater than 25 Mbps, while only 17% of the U.S. population lacked access at those speeds.<sup>2</sup> Montana had the worst access of any state. Only Vermont, at 80%, was close.

Disparities in speeds are common between residential and commercial offerings. This report includes later, in Table 4, many residential prices because those are more generally available

<sup>2</sup>Federal Communications Commission, "2015 Broadband Progress Report and Notice of Inquiry of Immediate Action to Accelerate Deployment," Adopted Jan. 29, 2015, and released Feb. 4, 2015. Appendix D, p. 97. The report said 90% of Montanans in rural areas did not have access to fixed 25 Mbps broadband download speeds, the same percentage as Vermont's rural population.

on websites than the business prices. Depending on the business, higher download and upload speeds may be critical to locating in Montana. Even for small mom-and-pop businesses that want to accept credit cards or debit cards, a certain speed is necessary. While, for example, art fair vendors can use handheld, wireless devices to run credit cards for buyers, not every fixed location has the appropriate connection or access to a connection to run that same information.

## Who are the Players?

### ***The Public Sector***

The public sector includes state and local governments as well as university entities; all have different capacities. Tribal governments are included separately after the Private Sector section.

### ***The State***

The "[State of Montana 2015 Biennial Report on Information Technology](#)" notes that the state government's "remote data circuits are a mixture of copper T1-based facilities and fiber-managed ethernet" (p. 42). Internet portals serving state offices are located in Helena and Billings, provided by separate carriers at speeds of 600 megabytes (MB) up to 1 gigabyte (GB). The report notes that "routers supporting these portals are capable of 10 Gb of throughput" (p. 41). Future capacity is expected to be 40 GB/100 GB. More bandwidth is needed, according to the report. In FY 2014, state government spent more than \$188.3 million for information technology services and equipment for the executive, legislative, and judicial branches (p. 58).

### ***Local Governments***

Counties may buy their own bandwidth through an Internet service provider or share the state's system. According to information provided by the State Information Technology Services Division (SITSD), 25 of Montana's 56 counties get their broadband service from the state's broadband network, SummitNet (Table 1). They pay their portion of the local circuit cost and a port charge for the network connection. Counties do not have to sign a contract, but they must agree to give the state a written notice 30 days before they disconnect.

The benefits to counties from using SummitNet, according to the information provided by SITSD, includes the option of obtaining e-mail, access to the criminal justice information network through the Department of Justice, access to the state courts system or the courts video conferencing system, and direct access to the Secretary of State's MT Votes system. Both the state and the counties benefit from being co-located, the SITSD information states, because they can share network resources in the same building or town, share circuit costs, and access a higher class of broadband service called Multi-Protocol Label Switching (MPLS), which is more expensive than residential service but offers a guaranteed bandwidth.

**Table 1: Counties/Local Governments Participating in State's SummitNet**

<i>Local Government</i>	<i>Megabyte Fiber Managed Ethernet (MPLS)</i>	<i>Other</i>
Beaverhead	5 MB	
Cascade	5 MB	
Daniels	1.5 MB T1 MPLS	

Anaconda-Deer Lodge County	10 MB	
Fergus	3 MB	
Flathead	30 MB SummitNet	60 MB Flathead County 911
Gallatin	10 MB	
Hill	3 MB	
Judith Basin	1.5 MB T1 MPLS - migrating to local broadband	
Lake	3 MB for Criminal Justice Information Network only	
Lewis and Clark		Leased dark fiber 1GB shared with state
Liberty	1.5 MB T1 MPLS	
Madison	10 MB	
Meagher	4.5 MB (3xT1)	
Missoula	45 MB	
Phillips	3 MB (3xT1) MPLS	
Powder River	1.5 MB T1 MPLS	
Prairie	1.5 MB T1 MPLS	
Ravalli	10 MB	
Rosebud	3 MB (2xT1) MPLS	
Sanders	3 MB (2xT1) MPLS upgrading to 20 MB	
Sheridan	6 MB (2xT1)	
Butte-Silver Bow	Migrating to MERDI's service. 10 MB now	
Stillwater	3 MB (2XT 1) MPLS	
Yellowstone	1 GB	

\*Multiprotocol Label Switching, a high-performance way of directing data.

### **University System**

The University of Montana campuses and the Montana State University campuses use hubs in Missoula and Bozeman, respectively. The MSU networks also serve Agricultural Research Centers in the state. The two hubs purchase some network services through the state, according to SITSD, but also get broadband benefits through membership in Internet2, a not-for-profit U.S. computer networking consortium composed of educators and researchers in schools, industry, and the government. The universities do not offer connections to those outside their universe.

## The Private Sector

According to information compiled by Phil Grate at CenturyLink from the National Broadband Map, at least 37 providers offered broadband services in Montana as of June 30, 2014. Broadband might be provided by any one of numerous types of providers, many of which may also have other telecommunications functions. A provider may be a local telephone company (ILEC), a competitive local exchange company (CLEC), a wireless internet provider (WISP), or a cable provider. Broadly, broadband services available to residences and businesses in Montana include:

- wireless (including cellular, satellite, and microwave-based services technologies); and
- wired (DSL, cable modem, and fiber) technologies.

To avoid terms like *exchanges* and *telephone company*, which take the emphasis off of broadband, Table 2 lists the classes of provider as mobile wireless broadband, DSL (digital subscriber line or loop) broadband, cable modem broadband, fixed wireless broadband, or fiber-to-the-premises (FTTP) broadband. Obviously, some of the providers are telephone companies, but the categories describe the type of technology generally used.

**Table 2: Types of Broadband Providers and Percent of Population with Access\***

<i>Type of Provider</i>	<i>Provider</i>	<i>% of Montana Population Able to Access Coverage</i>
Mobile Wireless Broadband	AT&T	93.5%
	Verizon	90.4%
	Another 3 providers	
Digital subscriber line (DSL) broadband	CenturyLink	70.3%
	Mid-Rivers Telephone Cooperative	4.7%
	Blackfoot Telephone Cooperative	4.6%
	Montana Sky Networks	4.0%
	Another 10 providers	Less than 4.0% each
Cable modem broadband	Charter Communications	63.5%
	Another 4 providers	
Fixed wireless broadband (uses a microwave platform that does not require a phone line or satellite feeds and can go to areas without DSL)	Pure Wireless, LLC - Billings Multiband Communications - Bozeman Big Sky Internet - Butte Blue Moon Technologies - Dillon Cybernet1, Inc. - Hamilton Yellowstone Communications Systems, Inc. - Livingston	Ranges from 26% to 0.1%
	Another 12 providers, including 5 telephone cooperatives	

Fiber-to-the-premises (FTTP) broadband	Montana Opticom, LLC - Bozeman	FTTP coverage is available to 3.4% of the state's population
	Another 5 telephone cooperatives	

\*Compiled primarily by Phil Grate at CenturyLink using National Broadband Map data.

## Tribal Component

A report filed as part of a protest against 2009 federal stimulus funds being awarded to one cable provider included a summary of broadband on Montana's seven Indian reservations.<sup>3</sup> Some highlights of that summary follow:

- **Blackfeet Reservation** - 81 miles of fiber, with FTTP in Browning South and with both Browning and Heart Butte having access to 10 Mbps and up. The report noted two service providers here: 3 Rivers and Northern. (Not included in the summary but available from a website description, Oki Communications, LLC, attributes the Indian Telecommunications Initiatives, created by the FCC in 1999, as one reason that Oki Communications came to serve the Blackfeet Reservation and Cut Bank.)
- **Crow Reservation** - 82 miles of fiber in the project service area. Five communities (Crow Agency, Lodge Grass, Willow Creek, Wyola, and Fort Smith) had access to 10-20 Mbps broadband.
- **Flathead Reservation** - 125-plus miles of fiber with FTTP to the premises or curb offered to every business on the reservation. Communities with access to 10 Mbps or more were Polson, Elmo, Dayton, Lake Mary, Ronan, and Yellow Bay. Penetration of broadband was reported as 98.4% with more than 70% having access to speeds of 10 Mbps or greater.
- **Fort Belknap Reservation** - 30 miles of fiber with FTTP to Harlem in 2012, in the Triangle Communications service area.
- **Fort Peck Reservation** - 524 miles of fiber in the Nemont service area, with FTTP in Reserve and Larslan. Communities with access to 20 Mbps were Frazier, Oswego, Larslan, North Nashua, Poplar, Reserve, Brockton, Poplar North, Wolf Point, and North Wolf Point.
- **Northern Cheyenne Reservation** - 72 miles of fiber, with 45 Mbps available to Lame Deer and 9 Mbps available in Busby, in the Range Telephone Cooperative service area.
- **Rocky Boy's Reservation** - 16 miles of fiber, with FTTP in South Havre, in the Triangle Communications service area.

## Funding Assistance

As part of the FCC's drive to bring America's telecommunications capabilities in both rural and urban areas up to a par with the capabilities in other developed countries, funding has gone out to states and to companies to help expand broadband. Not all of the funding appears to have had accountability measures attached. Some money has been in the form of grants, whereas other funds have come as low-interest loans. The 2014 Farm Bill included broadband extension as one of its targeted areas. The U.S. Department of Agriculture is taking applications through September 30, 2015, for \$20 million in the first of two loan cycles.

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<sup>3</sup>See "Fact Sheet: Rural Telco Investment Examples in Montana", available at [http://www.mitstel.com/hazardous/comments/Fact\\_Sheet\\_Rural\\_Broadband\\_Deployment.pdf](http://www.mitstel.com/hazardous/comments/Fact_Sheet_Rural_Broadband_Deployment.pdf).

Complicating the picture for funding is the variety of recipients, not all of which allow public access to the broadband services. For example, some USDA funding is specifically for schools and hospitals. One category of USDA awards, DLT grants, indicated that Billings Clinic Foundation received \$295,117 in 2012 while Anderson Public Schools in Big Horn, Gallatin, Roosevelt, Valley, and Yellowstone counties received \$496,780 for distance learning and telemedicine programs in 2010.<sup>4</sup>

Under a federal high-cost support program, both traditional telephone companies providing voice service over copper wires and broadband providers operating through wireless or fiber optic lines can receive funding. Data compiled by the Public Service Commission show that federal high-cost support received in Montana from 2004 through 2014 totaled \$900.4 million. Of that amount, about 46% went to the telephone cooperatives, which over that period received \$418.2 million in funding. Calculations compiled by CenturyLink's Phil Grate for the 11-year average from 2003 up to 2014 showed a greater percentage going to telephone cooperatives, as indicated in Table 3, which shows selected projects that have received past federal funding. The PSC data for 2004-2014 show the CenturyTel and Qwest Corp., companies operating under CenturyLink, getting \$183.3 million during that time, or 20.3% of the total. Information from both the 2003-2013 and 2004-2014 sets of data allows a comparison of funding fluctuations over time, with the breakdown for the 2003-2013 period more specific about recipients by type, which is why that data is used in Table 3.

**Table 3: Selected Broadband Funding by Year, Project Recipient, and Project Description**

<i>Year</i>	<i>Amount</i>	<i>Project Recipient</i>	<i>Project Description</i>
2010	\$32 million	Montana Opticom, LLC	Received stimulus funds to expand high-speed broadband, using FTTP, to rural communities and rural areas within Gallatin County. <i>ProPublica</i> reported that the Rural Utilities Service of the U.S. Department of Agriculture awarded the stimulus funds to extend "affordable and reliable broadband" to 7,745 households and 4,118 businesses. <sup>5</sup>
From 2009 to 2012 <sup>6</sup>	\$338,627,385	23 telecommunications projects	From the USDA Rural Utilities Service. Specifics not immediately available. Most likely includes funds listed above.
2013	\$20,839,000	1 project	Not immediately available.

<sup>4</sup>Data from <http://www.rd.usda.gov/files/dltawards-mt.pdf>, accessed Aug. 14, 2015.

<sup>5</sup>Information from ProPublica website, accessed Aug. 17, 2015, <http://projects.propublica.org/recovery/locale/montana/gallatin/dept/1200>.

<sup>6</sup>Information from the U.S. Department of Agriculture's Rural Development 2014 Progress Report, p. 48, accessed Aug. 14, 2015, <http://www.rd.usda.gov/files/RD2014ProgressReport.pdf>.

2014	\$24,856,000	3 projects	Not immediately available.
From 2003 up to 2014	\$825,804,222	Federal high-cost support funds	Distributed to: <ul style="list-style-type: none"> <li>• Wireless carriers - 8% or \$67,423,788</li> <li>• Qwest (CenturyLink) - 17% or \$139,771,351</li> <li>• Independents - 23% or \$185,906,264</li> <li>• Cooperatives - 52% or \$432,702,819</li> </ul>

## Costs

Costs vary as do the speeds and reliability of the various services. Affordability is one concern as businesses consider what types of technology they can access. The older high-speed option of T-1 lines might cost between \$1,000 and \$1,500 a month.<sup>7</sup> Various other technologies, including FTTP, could offer greater speeds, although reliability might be a concern. Table 4 provides some examples of charges by various broadband providers in Montana.

## Possible Actions by the State

The 2015 Legislature considered a bill to provide additional funding to expand broadband access in the state. House Bill No. 14 would have relied on bonding to supply the funds for loans or grants under the funding program. Tennessee in 2015 enacted a tax on cloud-based software access platforms, not specifically to fund broadband but as part of its revenue modernization efforts.<sup>8</sup> If the Economic Affairs Committee wants to pursue more study of broadband in Montana, the question is what role to take to encourage more funding of broadband through a proposal like HB 14, to encourage more accountability or transparency of existing funding, or to require more updates from the industry to learn what problems the state might address.

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<sup>7</sup>See <http://computer.howstuffworks.com/question372.htm>, accessed Aug. 14, 2015.

<sup>8</sup>See Christopher A. Wilson, "Reaching for the Clouds: Tennessee Taxes Cloud Computing Services," in *State Tax Notes*, June 8, 2015, p. 773.



**Table 4: Selected Montana Providers' Internet/Broadband Offerings by Speed and Charges When Available**

Provider	Service Area	Advertised Internet Speeds/charges*			
		1.5 Mbps**	Up to 8 Mbps**	Up to 50 Mbps**	up to 1 gigabit** or more
3-Rivers Communications	Big Sky and areas to Virginia City plus Browning, Choteau, Conrad, Fairfield, Fort Benton, Geyser, Neihart, Shelby		Up to 6 Mbps - \$89.95/mo.	Up to 26 Mbps available in Conrad, Shelby	Data plans
Blackfoot Telecommunications	Its <a href="#">network map</a> shows private service to Billings, Helena, Great Falls, Bozeman, Butte, Hamilton, Missoula, and Kalispell as well as out-of-state to Seattle, Denver, Chicago, St. Anthony, ID, and American Falls, ID. Among communities served are Alberton, Arlee, Avon, Condon, Dixon, Drummond, Ovando, Philipsburg, St. Ignatius, St. Regis, and Thompson Falls.	No prices listed online	--	--	Dedicated T-1 lines available
CenturyLink (includes Qwest and CenturyTel)	Most of Montana's major communities: Billings, Bozeman, Butte, Dillon, Forsyth, Glendive, Great Falls, Helena, Lewistown, Miles City, Kalispell, Missoula	Parts of Helena up to 40 Mbps - \$74/mo.	Parts of Missoula up to 40 Mbps - \$74/mo.	12 Mbps@ \$29.99/mo. for small business but not available universally; up to 100 Mbps advertised.	
Frontier Communications	Eureka, Libby, Noxon, Rexford, Troy		Up to 6 Mbps \$29.99/mo.		
Hot Springs Telephone Co.	Hot Springs			10 Mbps DSL \$69.95 rural, \$99.95 urban (monthly)	

Provider	Service Area	Advertised Internet Speeds/charges*			
		1.5 Mbps**	Up to 8 Mbps**	Up to 50 Mbps**	1 gigabit** or more
InterBel Telephone Cooperative	Eureka		up to 6mbps @ \$49.95/mo	up to 16 mbps fiber network @ \$59.95/mo	
Lincoln Telephone Co.	Canyon Creek and Lincoln	Up to 1 Mbps \$39/mo.	Up to 4 Mbps if available - \$99/mo		
Mid-Rivers Communications	Baker, Circle, Ekalaka, Melstone, Miles City, Poplar, Richey, Roundup, Ryegate, Sidney, Terry, Winnett, Wolf Point		Up to 8 Mbps@ \$44.95/mo.	Up to 50 Mbps - \$199.95/mo.	
Montana Sky Networks	Kalispell, Libby, Eureka, Columbia Falls (Flathead, Lake, and Lincoln counties)			Up to 10 Mbps at \$69.90/mo. DSL	
Nemont Telephone Cooperative (includes Project Telephone Co.)	Northeastern Montana, including Bainville, Culbertson, Dagmar, Flaxville, Glasgow, Outlook, Saco, Scobey, and Wolf Point			Up to 30 mbps - \$110/mo for business	Gigabit download offers as of April 2015.
Northern Telephone Cooperative	Cutbank, Devon, Kevin, Sunburst, Whitlash		DSL up to 6 Mbps - \$75/mo		
Range Telephone Cooperative	Southeastern Montana, including Rosebud, Treasure, Custer, Powder River, Carter, and Big Horn counties		Offers up to 6 Mbps - price unavailable		
Reservation Telephone Cooperative	Savage (based in Parshall, ND)				1 Gbps \$299.95/mo. for business

Provider	Service Area	Advertised Internet Speeds/charges*			
		1.5 Mbps**	Up to 8 Mbps**	Up to 50 Mbps**	1 gigabit** or more
Ronan Telephone Co.	West-central Montana, including Arlee, Charlo, Plains, Polson, St. Ignatius, Superior, and Thompson Falls	Up to 1 Mbps - \$24.95/mo.	Up to 8 Mbps - \$64.95/mo if available		
Southern Montana Telephone Co.	Divide, Grant, Jackson, Wisdom, Wise River	1.5 Mbps - \$59.90/mo.	Up to 3 Mbps - \$79.90/mo.		
Triangle Communications (includes Central Montana Communications)	Central Montana, including Big Sandy, Big Timber, Box Elder, Chester, Denton, Fort Benton, Havre, Hays, Joplin, Lodgepole, Malta, Rocky Boy, and Winifred	No prices listed online			
West River Co-op Telephone Co.	Near Camp Crook and into South Dakota		6 Mbps - \$89.99/mo		

\*Charges are taken from websites of the respective companies or cooperatives and do not include equipment or installation charges or any special bundling provisions with telephone or television services. The amounts generally are residential charges, because those are most commonly advertised. Based on a few examples that were available, business costs may run \$10 or more additional a month, although pricing decisions vary by company.

\*\*Megabits per second (Mbps) or gigabits per second (Gbps). These generally are the download speeds. Upload speeds may be significantly (up to one-half) less. The speeds vary according to broadband use in the residence or business and other Internet traffic in the vicinity.