THE CASE FOR UNIVERAL BROADBAND IN AMERICA: NOW!

A Report by the

Center for Creative Voices in Media

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EXECUTIVE SUMMARY

Today, more than three years after President Bush made universal broadband "in every corner of America" by 2007 an explicit goal of his administration, millions of Americans are still without broadband access to the Internet. The reality is that in 2007, there are wide swaths of our nation that have no broadband. Other areas have access only to low quality "fraudband" that is so slow, unreliable or unaffordable that it fails to meet other countries' definitions of broadband, and fails to provide the benefits that President Bush described when he established the goal.

Nor has the United States achieved President Bush's 2004 goal of being "ranked 1st when it comes to per capita use of broadband technology." At that time, America was ranked 10th. Today, not only is the United States not ranked first, it has slipped even farther behind to 15th.

The failure to achieve these goals is so striking that administration officials and regulators now regularly try to reinterpret the President's clearly expressed goal or move the goalposts that he set. Some say, for example, that it is not per-capita rankings in the industrialized world that matter. Others say that any conceivably possible way for a consumer or business to receive broadband access to the Internet, no matter how slow, expensive or consumer-unfriendly, qualifies as "universal, affordable access for broadband technology by the year 2007."

But a closer look at many of the broadband technologies that have been deployed in America reveals they are too slow, unreliable, unaffordable, unattractive to consumers and businesses, and/or inadequate to achieve the economic development, job growth, and quality of life benefits that President Bush touted as the reason America should establish the goal of universal broadband by 2007.

The bottom line is this: under any measure or metric, the United States has not kept up with the rest of the world in expanding its citizens' access to broadband. Americans do not have universal access to fast, reliable and affordable broadband. And if current policies and trends continue, broadband will not be deployed across America any time soon.

As a result of this failure, Americans are not enjoying the substantial benefits that universal broadband would bring. Here are just a few of the benefits Americans could be enjoying, but are not, because they lack fast, reliable, affordable, universal broadband:

- **Hundreds of Billions of Dollars in New Economic Development**

- **Over a Million New, High-Paying Jobs**

- **Increased Homeland Security and Public Safety**

- **Better Health Care at Lower Cost**

- **Enhanced Educational Opportunities**

- **Greater Citizen Participation in Government and Communities**

- **More Access to – and Participation in – Journalism, Culture and Entertainment.**

In this paper, we illustrate these benefits by sharing real-life stories of individual Americans whose lives have been changed for the better or worse depending on their access - or non-access - to high-quality broadband. Consider a few of these stories, where the difference between success and failure is access to broadband:

- *Success. Bob Hale, a farmer in rural northeast Oregon, has used his access to high-speed broadband to become the largest red onion supplier to the Subway sandwich chain.*

- *Success. Bobby Tuck was about to move his small survey and mapping business away from tiny Big Stone Gap, Virginia, because there was no broadband. After a regional planning commission deployed a fast, reliable, affordable broadband network, Tuck became a major player in his industry, expanding his business across America and into foreign countries – all from Big Stone Gap.*

- *Failure. The Longaberger Company, one of the largest privately held companies in America, built its business selling baskets and crafts produced in its home state of Ohio, where it is a major employer and civic booster. But it was forced to locate its new data center in another state because fast, reliable, and affordable broadband did not exist in the northeast Ohio area where the company is headquartered.*

- *Success. A regional effort to bring fast, reliable, affordable broadband to rural southwest Virginia has spurred the creation of so many high paying "knowledge-worker" jobs that to avoid a labor shortage, the state has established a "Return to Roots" program to lure back area natives who left before broadband arrived.*

- *Success: Cedar Falls, Iowa, deployed fast, universal broadband and saw its economy boom.*

- *Failure: Waterloo, Iowa, right next door to Cedar Falls, with broadband deployed only in limited areas, has seen its economy stagnate and its businesses relocate to Cedar Falls.*

- *Success. Homeland security and public safety officers from Hermiston, Oregon, to Washington, DC, utilize broadband to reduce emergency response times,*

conduct video surveillance, monitor hazardous chemical sites, run instant background and fingerprint checks, and file reports.

- *Failure*. *All of America's first responders should have a single nationwide broadband communications system with technology that is based on open standards. But this requires federal leadership that has been sorely lacking.*

- *Success*. *In Japan, fast broadband enables pathologists to use high-definition video and remote-controlled microscopes to examine tissue samples from patients living in areas without access to major hospitals.*

- *Failure*. *Japan has broadband that is eight to thirty times faster than the average speed in America. Here in the U.S., many exciting telemedicine applications that would improve health care and reduce costs are not available because broadband in so many sections of the country is too slow and unreliable.*

- *Success*. *Researchers project that deployment of fast, reliable and affordable broadband across America could generate $500 billion a year in added economic development, and expand U.S. employment by an estimated 1.2 million new and permanent jobs.*

- *Failure*. *Fast, reliable and affordable broadband that would generate such impressive economic and job growth has not been deployed across America, nor will it be deployed any time soon, without a concerted national effort led by the federal government.*

Ultimately, all these stories of success and failure tell one larger story: that all Americans must have access to fast, reliable, affordable, universal broadband.

Today, as Thomas Friedman has written, Americans increasingly live in a world gone "flat," as high speed Internet connections boost global competition by making borders, distance and even language irrelevant in the increasingly interconnected and networked world economy.

To succeed in this globalized world, our federal government must undertake a concerted national effort to deploy fast, reliable and affordable broadband to every corner of our nation. As has been true of federal efforts to spread telephone and electric service and to build our nation's vast network of superhighways, the benefits of this investment to our society will vastly outweigh its costs. Our nation will jump-start hundreds of billions of dollars of economic growth, create over a million high-paying new jobs, and improve the quality of life of our citizens. We will stop falling farther behind our international competitors, secure our leadership in global technology, enhance our homeland security and public safety, and provide all of our citizens with the opportunity to participate in the new, global, networked 21st Century economy and society.

As President Bush correctly noted when he set his universal broadband goal, how well our nation's leaders rise to this challenge will substantially determine whether America is "not only strong today and tomorrow, but for the decades to come."

With 2007 slipping by, the goal of fast, reliable and affordable broadband across America is still simply that – a goal not yet achieved. It is time for the federal government to redouble its so-far ineffectual efforts, and recommit its vast resources to turning this critical goal into reality.

INTRODUCTION - AMERICA IS PAYING A HIGH PRICE FOR FAILING TO ACHIEVE PRESIDENT BUSH'S GOAL OF UNIVERSAL BROADBAND BY 2007

This country needs a national goal for broadband technology, for the spread of broadband technology. We ought to have a universal, affordable access for broadband technology by the year 2007...

President George W. Bush, March 26, 2004[1]

What we're interested in is to make sure broadband technology is available in every corner of America by the year 2007. I mean, all over the nation is what we're interested in. (Applause.) … [O]n a per capita basis, America ranks 10th amongst the industrialized world. That's not good enough. We don't like to be ranked 10th in anything. The goal is to be ranked 1st when it comes to per capita use of broadband technology. It's in our nation's interest. It's good for our economy. (Applause.) The spread of broadband will not only help industry, it'll help the quality of life of our citizens.

President George W. Bush, June 24, 2004[2]

More than three years after President Bush made this commitment, however, millions of Americans are still without fast, reliable and affordable broadband access to the Internet. The reality is that in 2007, there are wide swaths of our nation that have no broadband access to the Internet. Other areas have access only to low quality "broadband" that is so slow, unreliable or unaffordable that it fails to meet other countries' definition of broadband, and fails to provide the benefits that President Bush described when he established the goal.[3]

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[1] President George W. Bush, Remarks by the President on Homeownership at Expo New Mexico (Mar. 26, 2004), http://www.whitehouse.gov/news/releases/2004/03/20040326-9.html.

[2] President George W. Bush, Remarks by the President on Innovation at U.S. Department of Commerce (June 24, 2004), http://www.whitehouse.gov/news/releases/2004/06/20040624-7.html.

[3] *See* Government Accountability Office, *Broadband Deployment Is Extensive throughout the United States, but It Is Difficult to Assess the Extent of Deployment Gaps in Rural Areas*, 8, 15-16 (2006), http://www.gao.gov/new.items/d06426.pdf ; S. Derek Turner, "*Shooting the Messenger": Myth vs. Reality: U.S. Broadband Policy and International Broadband Rankings* (July 2007), http://www.freepress.net/docs/shooting_the_messenger.pdf; S. Derek Turner, *Broadband Reality Check II: The Truth Behind America's Digital Decline* (Aug. 2006), http://www.freepress.net/docs/bbrc2-final.pdf (hereinafter Turner, *Broadband Reality Check II*); Alliance for Public Technology, *Achieving Universal*

Nor has the United States achieved President Bush's goal of being "ranked 1st when it comes to per capita use of broadband technology." In 2004, when President Bush established this goal, he noted that "on a per capita basis, America ranks 10th amongst the industrialized world. That's not good enough." Today, not only has the United States failed to become 1st, it has slipped even farther behind to 15th.[4]

The failure to achieve these goals is so striking that administration officials and regulators now regularly try to reinterpret the President's clearly expressed goal or move the goalposts that he set. Some say, for example, that it is not per-capita rankings in the industrialized world that matter. Others say that any conceivably possible way for a consumer or business to receive broadband access to the Internet, no matter how slow, expensive or consumer-unfriendly, qualifies as "universal, affordable access for broadband technology."[5]

But it is clear that under any measure or metric, the United States has not kept up with the rest of the world in expanding its citizens' access to broadband. And a closer look at many of the broadband technologies that have been deployed in America reveals they are too slow, unreliable, unaffordable and unattractive to consumers and businesses and/or inadequate to achieve the economic development, job growth, and quality of life benefits that President Bush articulated to justify why America should establish the goal of universal broadband by 2007.

For example, many claim that the availability of satellite broadband service shows that near universal broadband exists in America. But as many analysts note, including the federal government's own Government Accountability Office, satellite "broadband" download speeds are slower than the minimum recommended speed to watch streaming video, and its upload speeds are even slower. Other complaints include high equipment, installation and monthly service costs, service interruptions caused by bad weather, sluggish downloads and browsing, and restrictions on heavy bandwidth usage. Says one analyst, "In a direct competition with DSL or cable, satellite can't touch them." Cellular and other wireless "broadband" suffer from similar reliability, service, speed and cost problems.[6]

Tellingly, despite their increasing availability and affordability, the combined market share for satellite, cellular, broadband over power line (BPL), and other alternative

Broadband: Policies for Stimulating Deployment and Demand, 9, (2007), http://www.apt.org/publications/reports-studies/Final-Report-Feb2007.pdf; Robert D. Atkinson, *The Case for a National Broadband Policy*, 5, (June 2007), http://www.itif.org/files/CaseForNationalBroadbandPolicy.pdf.

[4] *Id.*

[5] *Id.*

[6] Tim Catts, "Rural Broadband Providers Look Skyward," *Business Week*, Aug. 14, 2007, http://www.businessweek.com/technology/content/aug2007/tc20070813_731298.htm; Government Accountability Office, *supra* note 3 at 8, 15-16; Turner, *Broadband Reality Check II*, *supra* note 3, at 4-5.

broadband technologies actually decreased from 2002 to 2006, demonstrating significant consumer dissatisfaction.[7]

Small businesses are even less likely to subscribe to these alternative technologies. Despite the fact that satellite service is available to them, "a full 50 percent of all small business owners report that without cable or DSL service, their only option was dial-up."[8]

It is true that these inferior "broadband" technologies, termed "fraudband" by many, meet the government's woefully inadequate definition of "broadband."[9] Yet, even though they are counted as "broadband," America has still fallen to 15th place in the global broadband rankings. Thus, these global statistics actually understate the lack of real, high-quality broadband in many areas of our nation.

The bottom line is that in 2007, America is not even close to the goal of deploying fast, reliable, affordable, universal broadband to its citizens. Nor will universal deployment happen anytime soon, unless America undertakes a serious, concerted national effort to deploy real broadband to every corner of the nation. Without such a concerted effort, paralleling that which extended telephone service, electricity and interstate highways across the nation, our citizens will fail to reap the tremendous benefits that broadband provides. Our nation and its workers will fall farther behind their global competitors.[10]

It is illuminating to compare the quality and cost of broadband in the U.S. with that in Japan; there, broadband connections today are available to most citizens that are not only eight to thirty times as fast as those available in the United States, but that are also considerably cheaper. Faster, better broadband in Japan, as well as in South Korea and much of Europe, is "pushing open doors to Internet innovation that are likely to remain closed for years to come in much of the United States."[11] Broadcast quality TV over the Internet, high definition teleconferencing, remote telemedicine, and advanced telecommuting are all not merely possible, but commonplace in many other countries today. However, in the U.S., the widespread availability of broadband that would enable these applications is years away.[12]

Dwelling on precisely where America sits in the world broadband rankings misses the point that President Bush made when he established his goal of universal broadband by 2007: fast, affordable, universal broadband will provide a wealth of tangible benefits for this nation's citizens – benefits that citizens in numerous other countries around the

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[7] Turner, *Broadband Reality Check II*, *supra* note 3, at 3-4.

[8] Turner, *Broadband Reality Check II*, *supra* note 3, at 23 (citing Hughes Network Systems, *Small Businesses in the Dark with Dial-up Internet Access* (Sept. 20, 2005)).

[9] Turner, *Broadband Reality Check II*, *supra* note 3, at 5-6.

[10] Communications Workers of America, *Speed Matters: A Report on Internet Speeds in All 50 States*, (July 2007), http://www.speedmatters.org/document-library/sourcematerials/sm_report.pdf.

[11] Blaine Harden, "Japan's Warp-Speed Ride to Internet Future," *Washington Post*, Aug, 29, 2007, at A1, http://www.washingtonpost.com/wp-dyn/content/article/2007/08/28/AR2007082801990.html?nav%3Dhcmodule&sub=AR.

[12] *Id*.

globe, where fast and universal broadband has been a serious national priority, are already enjoying.

Here are just a few of the benefits that Americans could be enjoying, but are not, because they lack fast, reliable, affordable, universal broadband:

- **Hundreds of Billions of Dollars in New Economic Development**

- **Over a Million New, High-Paying Jobs**

- **Increased Homeland Security and Public Safety**

- **Better Health Care at Lower Cost**

- **Enhanced Educational Opportunities**

- **Greater Citizen Participation in Government and Communities**

- **Greater Access to – and Participation in – Journalism, Culture and Entertainment.**

In this paper, we illustrate these benefits by sharing real-life stories of individual Americans whose lives have been changed for the better or worse depending on their access to high quality broadband. We also tell the stories of local communities, and how their decisions to deploy – or not to deploy - quality broadband have impacted their economies and the quality of life of their citizens. At the national level, we tell the impressive macroeconomic story of growth and job creation that universal broadband deployment would unleash.

In policy papers such as this, many rely on quantitative data rather than qualitative and anecdotal evidence to make their case. While there is no shortage of data in this paper, we believe that recounting the real life experiences of those whose lives have been changed by their access – or lack of access – to high quality broadband is a useful and necessary adjunct to empirical data. Through these stories, several of which were told by President Bush himself, we paint a more complete picture of why he made universal broadband by 2007 one of the highest priority policy goals of his administration. These stories illustrate why the case for fast, reliable, affordable and universal broadband remains so overwhelmingly compelling that America must immediately undertake a serious and concerted effort to extend broadband to every citizen in every corner of our nation.

The Center for Creative Voices in Media is a nonprofit 501(c)(3) organization formed by creative artists to preserve in America's media the original, independent, and diverse creative voices that enrich our nation's culture and safeguard its democracy. Our Board of Advisors includes many prominent Oscar, Emmy, Tony, Peabody and other award-winning media artists.

UNIVERSAL BROADBAND WILL GENERATE HUNDREDS OF BILLIONS OF DOLLARS IN FRESH ECONOMIC DEVELOPMENT AND CREATE OVER A MILLION NEW JOBS

Broadband saves costs throughout the economy. In other words, it makes the economy more efficient. Imagine how efficient businesses will be when they're that far away from their customer. That's what broadband technology will enable us to do.

President George W. Bush, June 24, 2004[13]

In the sparsely populated northeast corner of Oregon, outside the town of Hermiston, Bob Hale grows red onions. While sitting in the cab of his pickup truck, or standing out in the field beside his crop, he uses his laptop computer and a high-speed wireless broadband connection to the Internet to measure the moisture content of the soil, turn on his irrigation sprinklers, read and reply to email from customers, monitor the approaching weather, check prices in the agricultural markets, and even relax by listening to music over an Internet radio station.[14]

"I can take a picture of one of my onions, plug it into my laptop and send it to the Subway guys in San Diego," says Hale. It's critical to Hale's business that he stays in close communication with the "Subway guys," because he now supplies over two-thirds of all the red onions used by the Subway sandwich chain. From this beautiful yet remote slice of rural America, where a county of over 2,000 square miles has just 11,000 citizens and no traffic lights, Hale's business success depends upon his broadband connection to the Internet.

Hale is luckier than many other Americans who live outside heavily populated urban areas – he has access to affordable, reliable, high-speed broadband. The cable and telephone companies that provide over 98 percent of Americans with their broadband connections often refuse to offer broadband in rural areas because the higher per capita cost of installation may not earn a sufficient return on investment. As Hale notes, "Outside the [wireless broadband] cloud, I can't even get DSL."

Fortunately for Hale and the other citizens of northeast Oregon, a unique and imaginative public-private partnership came together to install an innovative wireless broadband "cloud" that covers over 700 square miles around Hermiston, providing Internet access that is reliable, affordable and always on, and which operates at speeds that leave telephone companies' DSL broadband offerings in the dust.

The Hermiston broadband network was initially set up for the benefit of government public safety and homeland security agencies, but industry experts say that the area's businesses stand to gain the most. For example, the Columbia River Port of Umatilla, one of the largest grain ports in the nation, is using the wireless network to establish an

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[13] Bush, *supra* note 2.
[14] "Wi-Fi Cloud Covers Rural Oregon," *Wired*, Oct. 16, 2005, http://www.wired.com/gadgets/wireless/news/2005/10/69234 (hereinafter "Wi-Fi Cloud").

electronic system that will efficiently scan bar codes on incoming cargo, a crucial capability for increasing port and homeland security. "It has opened our eyes and minds to possibilities. Now that we're not tied to offices and wires and poles, now what can we do?" says Kim Puzey, port director.

Big Stone Gap, Virginia, is an Appalachian town of fewer than 5,000 residents in Virginia's western tip, near the Cumberland Gap and the borders of West Virginia, Kentucky and Tennessee. According to the 2000 census, the median income for a Big Stone Gap household was $21,584, and the median income for a family was $34,306. About 22.4% of families and 25.8% of the population were below the poverty line, including 34.5% of those under age 18 and 15.1% of those age 65 or over.[15]

In the mid-1980s, Bobby Tuck created Tuck Mapping Solutions in Big Stone Gap, a small business that provides survey and mapping services to coal mine operators in the area. In the early days, he delivered his reports and maps to his clients on floppy disks.[16] But then the Internet came along, and Tuck saw a way to dramatically increase the efficiency of his business by transferring his files to clients electronically over the web – the way his competitors did. There was just one problem: dial-up file transfer was too slow to accommodate the size of the files he needed to transfer, and Tuck and almost everyone else in Big Stone Gap had no access to high-speed broadband. Eventually, as the file sizes grew, and broadband was still unavailable in Big Stone Gap, Tuck had to load hard disks in his car and drive them to his clients' offices. If he was lucky, or a client felt sorry for him, sometimes the client would meet him half-way.[17]

Tuck could not grow his business unless he had the ability to deliver his ever-larger data files to his customers in a modern and efficient way – via the Internet – but Big Stone Gap was not scheduled to receive broadband service from existing telecom or cable providers, or any other private entity. Despite having been in the Big Stone Gap area for 20 years, Tuck was on the verge of relocating.

Fortunately, a regional planning commission won funding to bring a fiber connection to the Big Stone Gap area. With access to a 100-megabit-per-second broadband Internet connection, Tuck's company could suddenly download critical data files in two or three minutes, when it had taken eight hours before. He could transmit files that in some cases had grown to 150 gigabytes.

Tuck's business turned around. "What it's done for us is make us a major player in our field," says Tuck. "We could work almost anywhere, once we have access to data. It doesn't make a whole lot of difference where we're located."

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[15] *Big Stone Gap, Virginia*, http://en.wikipedia.org/wiki/Big_Stone_Gap (last visited Sept. 20, 2007).
[16] Tuck Mapping Solutions, Inc., http://www.tuckmapping.com/ArticleViewer.aspx?ObjectId=3 (last visited Sept. 20, 2007).
[17] John Borland and Jim Hu, "A Life-Saving Technology," *CNET News*, July 26, 2004, http://news.com.com/Broadband+A+life-saving+technology/2009-1034_3-5261361.html.

According to his company's website, "Today, Tuck's services extend far beyond coal mining companies and the borders of Virginia extending across the United States and into some foreign countries." He is still located in - and is staying in - Big Stone Gap, Virginia.[18]

Tuck's success story is not unique in the remote Appalachian areas of Virginia. Rather, as we will see below, broadband has brought economic opportunity and development to the entire region. "We see broadband as a key, key component for economic development in this region," says Marc DeFalco, who heads the telecommunications program for the Appalachian Regional Commission, a 13-state economic development agency. "We look on broadband as a means of opening up rural areas to the same opportunities that people would have in urban areas."[19]

In the village of Essex Junction, Vermont, population 8,591 in the 2000 census, Dave Contois operates Contois Music with his family. He starts each day by paging through a folder filled with e-commerce invoices from Web site orders. Although he has been in business for 35 years, Contois now expects to generate 70 percent of the store's $2 million in annual revenues through Internet sales. "High-speed Internet has definitely changed the business, for sure," says Contois.[20]

"It's a whole different thing than just waiting on customers," says Judy Contois, Dave's mother. Customers visit the store's website and call from thousands of miles away with product questions and orders. "I ... talk to people all over the U.S.," she says.

Jeff Carr, the State of Vermont's economist, says the Internet is "a great leveler of the economic playing field because ... (it) eliminates the necessity of proximity to your market ... So it's very important for a state like Vermont, which is really kind of far away from the growing consumer markets in the Southeast, Southwest and Mountain West."[21]

For those lucky Vermonters with broadband, the Internet has eliminated Vermont's geographic isolation, allowing them to sell their products and ideas globally. The result is "a competitive situation unlike any time in our economic history," Carr says. "We're not sheltered anymore."

"It really is remarkable how important it is," Michael Monte, director of Burlington's Community and Economic Development Office, says of high-speed Internet access ... Broadband access is "critical to the success of the local economy."[22]

Greg Glade can testify to that. He runs Top of the World Books from his condominium in Williston, population 7,560, making the majority of his sales of mountain and polar

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[18] Tuck Mapping Solutions, Inc., *supra* note 16.

[19] Borland and Hu, *supra* note 17.

[20] Dan McLean, "Broadband or Bust," *Burlington Free Press*, Nov. 5, 2006, http://www.vtbroadband.org/stories/storyReader$98.

[21] *Id.*

[22] *Id.*

exploration books through the Internet. He says that the Internet has increased his sales twenty fold. "It's gone up tremendously," Glade says of his business. "I would never know somebody in France without the Internet. The Internet allows them to find me."[23]

But many Vermonters still do not have broadband. The Internet has not lessened their geographic isolation. Quite the contrary, with ever more commercial and cultural activity taking place online, their lack of broadband has heightened their isolation.

Bill and Ursula Johnson are dairy farmers in the bucolic northeast Vermont town of Canaan, an area without affordable broadband access to the Internet. Dairy farmers are well known for waking up early to milk their cows, but the Johnsons must wake up even earlier in order to do their payroll. Their dial-up connection is so slow and unpredictable that the only time they can reliably get onto the Web site of the company that handles their payroll is at 4:00 in the morning, when it is less busy.[24]

Mr. Johnson doubles as state representative for the area, and he does not even bother logging on to deal with that. He communicates with colleagues in Montpelier, the capital, by phone and U.S. mail instead.

Verizon, the local phone provider, is not only not investing in supplying broadband to Canaan and other Vermont communities; it is trying to sell its Vermont phone lines to FairPoint, a much smaller phone company based in Charlotte, North Carolina. The Johnsons, and many other Vermonters, rightly worry that if a big company like Verizon will not invest the funds necessary to provide them with broadband Internet access, why would a small North Carolina company with fewer resources do so?

Regarding the sale of Verizon's telephone and Internet access business in New England, one analyst commented, "These guys [small business owners in Vermont] were freaking out because the only network they've been able to have up there is an [asynchronous transfer mode] network, and it's going away when Verizon leaves . . .They may have to move."[25]

"We have companies that lose money because they don't have broadband," says Maureen Connolly, a director at the Economic Development Council of Northern Vermont. "We're not a third world country. We shouldn't have to beg for service."[26]

Today, over 35.7 million Americans work from home.[27] Often, a high speed broadband Internet connection is required. For example, Alpine Access employs 7,500 home-based

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[23] *Id*.

[24] Ken Belson, "Rural Areas Left in Slow Lane of High Speed Data Highway," *New York Times*, Sept. 28, 2006, http://www.nytimes.com/2006/09/28/technology/28vermont.html?ex=1317096000&en=7994fdd1dd7c1179&ei=5090&partner=rssuserland&emc=rss.

[25] Robert L. Mitchell, "ISPs to Rural America: Live with Dial-Up," *Computer World*, Aug. 27, 2007, http://www.computerworld.com/action/article.do?command=viewArticleBasic&articleId=299844&intsrc=hm_ts_head.

[26] Belson, *supra* note 24.

call center agents, using the Internet to connect their homes to the company's servers and offices. Those who want to work from home but do not have broadband need not apply. "Access through our Web site is the only way you can become an employee here," says Rick Owens, vice president of technology. "Some type of broadband service is necessary."[28]

To relieve congested highways, reduce pollution, lower costs, and improve employee efficiency, Congress mandated that by 2004, federal agencies offer their employees the opportunity to "telework," or work from home. But the effort has been largely unsuccessful, because so many employees do not have access to broadband. Dan Matthews, U.S. Department of Transportation CIO, says, "employees need high-speed Internet access to work on large files, take part in videoconferencing and online chats with one or more co-workers … you can't work using dial-up Internet access."[29]

This anecdotal evidence, illustrating that fast, reliable and affordable broadband access to the Internet is a significant driver of economic development, is borne out by academic research on the impact of broadband on entire communities.

Not far from Big Stone Gap, Virginia, local and regional officials identified the lack of open-access fiber networks as a key impediment to economic development in the region. They joined forces to fund, complete and deploy a dynamic 144 strand fiber optic network to provide the region with a state-of-the-art telecommunications infrastructure, giving current and new industries in the area a competitive advantage in a connected, global economy.[30]

Two IT giants, CGI and Northrop Grumman, soon announced that they would locate major telecommunications operations in the area, creating 733 high skill, high wage IT jobs and investing $30 million in private funds. CGI announced that the average annual salary for its 300 employers would be about $50,000, while Northrop Grumman announced an average annual salary of $40,000 for its 433 workers. Both figures are well above Russell County's current annual salary of $27,111. Because it deployed advanced broadband, the region's vision of "farm-shoring," in contrast to off-shoring, is becoming a reality.[31]

In addition to the direct economic benefits, significant secondary and indirect benefits to the region have been observed. Large new, unsubsidized housing developments have been built. A gourmet coffee shop opened. Plans were announced for the first 18-hole golf course between Abingdon and Tazewell. A local development group has submitted an application to Marriott for a new Fairfield Inn in Lebanon.[32]

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[27] Mitchell, *supra* note 25.

[28] *Id.*

[29] Jason Miller, "Lack of Broadband Access Hampers Agency Telework Acceptance," *Government Computer News*, Oct. 13, 2004, http://www.gcn.com/online/vol1_no1/27628-1.html.

[30] *Russell County Information Technology Project*, http://goveda.org/About/ceda/CEDA-RussellCounty-Narrative.pdf (last visited Sept. 20, 2007).

[31] *Id.*

[32] *Id.*

In a "Man Bites Dog" twist that demonstrates the success of "farm-shoring," a large Indian company, Essel Propack, picked southwest Virginia for a major new manufacturing facility.[33]

Indeed, Virginia's efforts to create high-tech, high wage jobs in the southwestern parts of the state that were devastated by the loss of jobs in the coal, tobacco and furniture industries have been so successful that some fear there will be a shortage of qualified IT workers to staff the newly created positions. To address this problem, and reunite families torn apart by the economic malaise of the region, Governor Tim Kaine created the "Return to Roots Project" to bring young Virginians who left the region in search of economic opportunity back home to the good paying jobs that have now been created.[34]

Rural communities around the country that have access to fast affordable broadband are benefiting from the growing movement to "farm-shore" knowledge work, rather than move it offshore. In Watford City, North Dakota, where the nearest traffic light is 50 miles away, a programming and call center operates out of an old John Deere tractor showroom.[35] Programmers there make $40,000 a year, far above the prevailing wage rate in that remote western North Dakota town.[36]

"There is talent in areas that have a low cost of living and have no knowledge-work," says Kathy Brittain White, the founder and president of Rural Sourcing, Inc. Her company has opened programming centers in Jonesboro, Arkansas and Portales, New Mexico, and is looking at similar broadband-rich locations in West Virginia and North Carolina for additional facilities. New graduates of local universities are often willing to work at these facilities for far less money than they might earn in a large city, in order to be closer to home and enjoy the lifestyle and lower cost of a rural environment.[37]

The movement to utilize fast, affordable broadband to keep jobs from going offshore is not limited to remote rural areas. In Oklahoma City, Ciber Inc., a computer-consulting firm with $840 million in annual sales, opened in 2005 its first low-cost programming site in a vacated call center, using work stations and telephone operators left behind.[38] Computer work "is going to go somewhere else cheaper, and it can either go to Bangalore or it can go to Oklahoma City," says Tim Boehm, the executive in charge of Ciber's low-cost initiative. The company plans five or six centers in the next two years, all in mid-sized cities.[39]

The problem of lack of high-speed Internet access is also not limited to small businesses in small markets. Trans World Entertainment operates over 1,000 music stores across the

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[33] Governor Mark Warner (VA), "A Governor Looks at Asia," Speech at the Asia Society (Nov. 28, 2005) http://www.asiasociety.org/speeches/warner05.html.

[34] *Return to Roots*, http://www.returntoroots.org/News_and_Press.php (last visited Sept. 20, 2007).

[35] Adam Geller, "Companies Seek Low-Cost Foothold in the Heartland," *Bismarck Tribune*, June 20, 2005, http://www.bismarcktribune.com/articles/2005/06/21/news/state/sta03.txt.

[36] *Id*.

[37] *Id*.

[38] *Id*.

[39] *Id*.

nation - including its Coconuts and f.y.e. chains – and uses DSL broadband service to efficiently link these stores to the parent company's back-end systems. It also uses broadband to deliver music and video clips to its local stores for customers. But CIO Robert Hinkle reports that, "Unfortunately, DSL isn't available everywhere yet, even in retail areas. Right now, about 17% [of store locations] can't get broadband."[40]

Several research studies have found strong evidence that deployment of affordable, fast broadband access to the Internet in a community generates significantly more economic development in that community than takes place in similarly situated communities without broadband – or even with slower broadband.

The results of a research study comparing Cedar Falls and Waterloo, Iowa, two communities located side by side in the Cedar Valley region of the state, are illustrative – and striking. Unhappy with the pace of private broadband deployment in their community, local leaders in Cedar Falls chose to deploy a citywide municipal high speed fiber network around that town. In nearby Waterloo, local leaders chose to rely only on broadband provided by the private local phone and cable companies, which was slower and not as universally available as the fiber deployed in Cedar Falls.[41]

The research study found that in the time studied, 11 companies relocated from Waterloo to Cedar Falls. In the same time frame, Cedar Falls has not lost a single business to relocation. Waterloo Mayor John Rooff concluded that, "Fiber optics is the key to Waterloo's future growth. In order for Waterloo with its businesses to move into the 21st century, we need fiber optic capability…I believe it has hurt us economically to not be able to provide fiber optics to businesses locating in our city."[42]

The study author also noted an article published in the *Waterloo-Cedar Falls Courier* on July 12, 2002 that reported, "Cedar Falls set a Cedar Valley construction record this fiscal year, topping out at more than $101 million…Despite a downturn in the national economy, the city blew away all existing records in the fiscal year ending June 30…Meanwhile, the city of Waterloo failed to escape the stalled economy…Suffering from declining commercial permits and no large industrial projects to boost the value, the city recorded less than $53 million in construction during the last fiscal year - its lowest total in eight years."[43]

Concludes the researcher:

> *Cedar Falls and Waterloo are adjoining communities with only a sign separating the two. It is extremely difficult for a visitor to identify departing one community*

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[40] Robert L. Mitchell, "Rural Broadband Drought Puts Hurt on Retailer," *Computer World*, Aug. 27, 2007, http://www.computerworld.com/blogs/node/6093.

[41] Doris J. Kelley, *A Study of the Economic and Community Benefits of Cedar Falls, Iowa's Municipal Telecommunications Network* (Oct. 2, 2003), http://www.iprovo.net/projectInfoDocs/economicAndCommunityBenefitsStudy.pdf.

[42] *Id*. at 11.

[43] *Id*.

and entering the other. While Cedar Falls is a quaint community, Waterloo imparts a city resonance.

An analysis of the information collected shows that there are very few differences between these two communities. Both communities are located in the same geographical area, Waterloo is approximately double the population of Cedar Falls, both communities have access to the same highway systems, draw from the same water source, their electric rates are some of the lowest in the country, both have equal access to railheads, motor carriers and airport and offer land at reasonable prices... **The major disparity is Cedar Falls' municipal communications network - a key component for economic growth in a "knowledge driven economy."**

Although the implementation of Cedar Falls' Communications Network is relatively young, Cedar Falls is already reaping economic and community benefits... There may be no single thing more important in a community's efforts to achieve economic well-being than to grasp the role that telecommunications plays in creating meaningful jobs, enhanced education and world class healthcare. Now, more than ever, the direct link is evident between advanced communications and productivity and economic development.[44]

Researchers studying the impact of affordable high speed broadband on economic development in Lake County, Florida came to a similar conclusion. There, the city of Leesburg deployed an extensive, fiber-optic broadband network throughout Lake County, and then made it available to businesses and government institutions in order to boost economic development in the county. The researchers concluded that:

Lake County has experienced a 100% increase – a doubling – in economic growth relative to its Florida peer counties since offering its municipally owned broadband network broadly to public and private entities. This growth rate is not a function of population growth – indeed, on a per capita basis, Lake County has experienced 128% growth over its peers since the municipal broadband network was built.[45]

Interestingly, the Florida researchers hypothesized that the Lake County network, like the Cedar Falls network, may have provided significant added economic benefits to the community because it was deployed by the municipality itself and not a private for-profit provider.

It is important to understand that Lake County's peers no doubt had at least some private broadband network in their communities during the time period evaluated, but these privately-owned networks did not produce the sizeable growth of Lake County's municipal system. This difference may be the result of

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[44] *Id.* at 12-13.

[45] George S. Ford and Thomas M. Koutsky, "Broadband and Economic Development: A Case Study from Florida," *Applied Economic Studies*, April 2005, at 15, http://www.aestudies.com/library/econdev.pdf.

the difference in deployment incentives. A municipally-owned broadband infrastructure (like Lake County's) is generally built to fulfill the public benefit of broadband, rather than simply to increase the profits of private firms. It is reasonable, then, to hypothesize that private network providers, since they would not collect as profits all of the benefits that a community would reap from a broadband infrastructure, would not necessarily deploy infrastructure as extensively or pervasively.[46]

In South Dundas Township, Ontario, Canada, researchers working for the United Kingdom Department of Trade and Industry found similar economic benefits to that municipality's deployment of a fiber network allowing high speed access to the Internet.[47] The cost of the network to South Dundas was $1.3 million CDN (all figures relating to South Dundas below are Canadian dollars). The immediate directly attributable return on that investment for the two years studied, 2001-03, was:

- 62.5 new jobs;
- $2.8 million in commercial / industrial expansion; and
- $140,000 in increased revenues and decreased costs.[48]

The researchers then estimated the following "direct, indirect and induced impacts" that the Township's investment in its network would have for the next two to four years:

- $25.22 million increase in GDP for Dundas County and $7.87 million increase for the Province of Ontario;
- 207 person years of employment for Dundas County and 64 for the rest of Ontario; and
- $3.5 million increase in provincial tax revenues and $4.5 million increase in federal tax revenues.[49]

Finally, the report concludes that:

The data suggests that there is a strong link between job growth and broadband access to the Internet in South Dundas. A causal link could not be established due to the limited nature of this study though the correlation appears to hold across industry sectors and organization size.[50]

Researchers have also observed the negative impact on communities from a lack of universal and affordable broadband access to the Internet.

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[46] *Id*. at 16.

[47] Strategic Networks Group, *Economic Impact Study of the South Dundas Township Fibre Network*, June 27, 2003, http://www.dti.gov.uk/files/file13262.pdf.

[48] *Id*. at 3.

[49] *Id*.

[50] *Id*.

The Longaberger Company, based in Newark, Ohio, was founded over three decades ago by a native Ohioan who thought there might be a business in selling local folk artisans' charming handmade baskets. Today, according to its website, the Longaberger Company is "America's premier maker of handcrafted baskets, and offers other home and lifestyle products, including pottery, wrought iron, fabric accessories, and specialty foods."[51] Forbes Magazine has recognized Longaberger as one of the 500 largest privately-held companies in the U.S.[52]

In northeastern Ohio, Longaberger operates a "Homestead and Basketmaking Campus" that is open to the public. It also operates the Longaberger Golf Club and a hotel. The headquarters of the company is a tourist attraction, housed in a "basket" that is 160 times the size of the Longaberger Medium Market Basket.[53]

In addition, the Longaberger family has a long history of devoted service to the citizens of Ohio. Since 1996, the CEO of the company, Tami Longaberger, has served on the Board of Trustees of The Ohio State University, her alma mater. The family has a building on the OSU campus named after it.[54]

When the Longaberger Company was looking for a place to site its new data center to handle its web portal transactions, its first choice was, of course, Ohio. But the absence of affordable and reliable broadband Internet service in northeast Ohio where Longaberger is headquartered instead caused the company to site its new data center in New York. Researchers for the Ohio state government concluded, "[T]his represents a lost opportunity to create jobs in Ohio that can be attributed to the costs of network services."[55]

Goshen, Massachusetts, also illustrates the economic and social costs of the absence of affordable broadband. In Goshen, a rural town of about 1,000, an unusual ritual takes place every day outside the Town Hall. There, local citizens without any access to affordable broadband jockey for position as they try to park their cars where they will receive the strongest signal from the Town Hall's open access broadband Wi-Fi connection. Then, these broadband-starved citizens open their laptops and log onto the Internet. "The coverage is pretty good in the driveway," says Selectman Larry Miller, who recently drove to the Town Hall to order a cell phone for his daughter because his dial-up connection at home was too slow.[56]

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[51] Longaberger, http://www.longaberger.com/ourCompany.aspx (last visited Sept. 20, 2007).
[52] "Sofia Becomes New Chairman of OSU Board of Trustees," May 2, 2003, http://www.osu.edu/news/lvl2_news_story.php?*Id*=439.
[53] Longaberger, *supra* note 51.
[54] "Sofia Becomes New Chairman of OSU Board of Trustees," *supra* note 52.
[55] Ohio Supercomputer Center for the Ohio Department of Development, *Availability and Cost of Broadband Internet Service Options in Ohio* (2006), http://www.osc.edu/networking/broadband/docs/Broadband2006.pdf.
[56] Carolyn Y. Johnson, "Towns Left Scrambling for Touch of Broadband," *Boston Globe*, July 18, 2007, http://www.boston.com/business/technology/articles/2007/07/18/towns_left_scrambling_for_touch_of_broadband/.

In 32 towns in Massachusetts, no providers offer broadband, and in an additional 63 municipalities, broadband is available in only limited service areas. "We are creating a new kind of ghetto," says Don Dubendorf, president of Berkshire Connect Inc., which works to bring high-speed Internet connections to Western Massachusetts businesses and institutions. "It's morally wrong. It's stupid economically, it's dangerous from a public safety point of view, it's absurd from a public education point of view."[57]

The lack of broadband negatively impacts business, government, education, culture and many other aspects of life for citizens of these towns. Worthington Selectman Evan Johnson says that about once a month the town is notified by the state that a government agency will accept electronically-filed documents only, whether it is a test that everyone in Town Hall must take for homeland security reasons or tax documents. But with the town having only slow dial-up Internet access, "Click wrong and another hour of your life is gone," says Johnson.[58]

Leland Martin, 15, of Blandford, made videos at film camp over the summer. The videos are posted online, but he and his friends cannot watch them because they have only dial-up access to the Internet, which is too slow to handle video.[59]

Steve Schulze of Worthington, tried to prepare his taxes online. But then, TurboTax prompted him to download a program update. The dial-up download was so slow, he finally gave up.[60]

Web designers are increasingly building more elaborate and functional websites that require broadband to load satisfactorily. For Kimberly and Amanda Cross, 19-year-old twins who have a technology-oriented summer job building circuit boards at Worthington Assembly, an electronics manufacturer, it takes about 45 minutes to upload a few photos to their Facebook pages. They have looked at YouTube just twice. Says Amanda, "It's frustrating - the most patient person in the world is not patient enough." Recently, they applied to colleges, another process that seemingly took forever using their dial-up connection.[61]

"For Massachusetts, it's economic survival," says Patrick Larkin, director of the John Adams Innovation Institute at Massachusetts Technology Collaborative. "These are market failures, and I don't believe that by virtue of where you live it should dictate your ability to have threshold services in the Commonwealth."[62]

Researchers studying the economic impact on the nation as a whole have found results consistent with the analyses of impact at the local or community level: the deployment of

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[57] *Id.*
[58] *Id.*
[59] *Id.*
[60] *Id.*
[61] *Id.*
[62] *Id.*

universal, fast, affordable broadband access to the Internet generates a wealth of economic growth and an avalanche of good jobs.

For example, in one widely quoted study done in 2001, researchers wrote:

> *We conclude that the universal adoption of broadband Internet connections by U.S. households could eventually provide consumers with benefits in the range of $200 billion to $400 billion per year. Moreover, producers of networking equipment, household computers, ancillary equipment, and software, and producers and distributors of entertainment products could also benefit by as much as $100 billion per year. Other firms will be more likely to prosper in world markets because of their earlier experience with the needs and opportunities created by households with modern networks and high-speed connections.[63]*

In other words, **deploying universal broadband could generate $500 billion a year in added economic development.**

Using a different methodology, researchers reported in a 2006 study commissioned by the U.S. Department of Commerce that:

> *The results support the view that broadband access does enhance economic growth and performance, and that the assumed economic impacts of broadband are real and measurable (emphasis in original). We find that between 1998 and 2002, communities in which mass-market broadband was available by December 1999 experienced more rapid growth in employment, the number of businesses overall, and businesses in IT-intensive sectors, relative to comparable communities without broadband at that time.[64]*

> *The positive direction of broadband's impacts was found to be robust across the different models tested at the zip code level, including models of economically distressed areas such as the Appalachian region. Our findings thus support the conclusion that broadband positively affects economic activity in ways that are consistent with the qualitative stories told by broadband advocates. Economic development practitioners who have been spending their time or money promoting broadband have indeed been engaged in a worthwhile pursuit... Broadband is clearly related to economic well-being and is thus a critical component of our national communications infrastructure.[65]*

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[63] Robert W. Crandall and Charles L. Jackson, *The $500 Billion Opportunity: The Potential Economic Benefit of Widespread Diffusion of Broadband Internet Access (*2001), http://www.att.com/public_affairs/broadband_policy/BrookingsStudy.pdf.

[64] Sharon E. Gillett, et al., *Measuring the Economic Impact of Broadband Deployment*, 3, http://www.eda.gov/ImageCache/EDAPublic/documents/pdfdocs/mitcmubbimpactreport_2epdf/v1/mitcmubbimpactreport.pdf.

[65] *Id*.

Researchers have concluded that the deployment of universal, fast and affordable broadband is also a boon to employment. For example, a study for the New Millennium Research Council found that: **building and using a robust, nationwide (broadband) network will expand U.S. employment by an estimated 1.2 million new and permanent jobs**,[66] specifically:

- 166,000 jobs in the telecommunications sector;
- 71,700 manufacturing jobs generated by the direct purchase of network plant and equipment and customer premise equipment; and
- 974,000 indirect jobs created if a next generation network were built.[67]

Importantly, concludes the research, these would be "well-paid, high-skill jobs" that would provide "a welcome boost to our economy."[68]

In a 2007 paper, researchers Crandall, Lehr and Litan also found a "strong link"[69] between broadband use and employment, writing:

> *More specifically, for every one percentage point increase in broadband penetration in a state, employment is projected to increase by 0.2 to 0.3 percent per year. For the entire U.S. private non-farm economy, this suggests an increase of about 300,000 jobs, assuming the economy is not already at "full employment" (the national unemployment rate being as low as it can be with a low, stable rate of inflation).*[70]

The qualitative and quantitative evidence is clear and consistent: At the individual, local/community, and national levels, the universal and rapid deployment of fast, reliable and affordable broadband access to the Internet will stimulate tremendous economic development and create hundreds of thousands – if not millions – of good paying jobs that might otherwise be lost or go offshore.

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[66] Stephen B. Pociask, *Building a Nationwide Broadband Network: Speeding Job Growth*, (2002), 1, http://www.newmillenniumresearch.org/event-02-25-2002/jobspaper.pdf.
[67] *Id*.
[68] *Id*.
[69] Robert Crandall, et al., "The Effects of Broadband Deployment on Output and Employment: A Cross-Sectional Analysis of U.S. Data," *Issues in Economic Policy*, July 2007, at 3, http://www3.brookings.edu/views/papers/crandall/200706litan.pdf.
[70] *Id*. at 2.

UNIVERSAL BROADBAND WILL MAKE AMERICA SAFER

"Remember, we're still in a battle against ideological extremists who use terrorism as a tool to frighten, scare, kill people such as us who love freedom. And, therefore, what I'm telling you is as broadband expands, it's going to enable us better to protect our homeland, which is a vital concern of any of us in our government."

President George W. Bush, June 24, 2004[71]

Numerous real world examples demonstrate that the universal deployment of fast, reliable and affordable broadband access to the Internet will enhance our nation's homeland security and public safety. In short, universal broadband will make America safer.

Consider Hermiston, Oregon. The high desert around Hermiston is home to the Umatilla Chemical Depot, one of the nation's largest stockpiles of Cold War-era chemical weapons. Four decades ago, 7.4 million pounds of nerve gas and blister agent were moved there. The Depot also incinerates chemical weapons, including rockets filled with deadly sarin gas. The Umatilla site is both highly dangerous and also a tempting target for terrorists.[72]

In December 2004, a trace amount of sarin nerve agent vapor was detected in a depot storage structure. Under federal guidelines, local government officials were required to devise an emergency evacuation plan for the accidental release of nerve and mustard agents. Fortunately, the 2004 gas release was not a threat to the general public, but it demonstrates that first responders need to be able to communicate while on the move.[73]

Says Casey Beard, the director of emergency management for Morrow County, "We had to find a way to transmit huge amounts of data - pictures, plume charts....All that data is very complex and it's hard over radio to relay to someone wearing chemical protective gear."[74]

These critical homeland security and public safety needs drove Hermiston and its surrounding counties to install a 700 square mile wireless broadband cloud. Emergency responders in the area surrounding the depot are now equipped with laptop computers that are Wi-Fi ready. These laptops are set up to detail the size and direction of a potential chemical leak, enabling responders to direct evacuees from the field. Billboards posting evacuation messages can also be controlled remotely over the wireless network.

In addition, the wireless broadband cloud enables the Hermiston Police Department to equip its squad cars with wireless laptop computers. If nerve gas does escape, officers

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[71] Bush, *supra* note 2.
[72] Eric Griffith, "Wireless Watches the Gas," *Wi-Fi Planet*, Feb. 3, 2005, http://www.wi-fiplanet.com/columns/article.php/3468121.
[73] *Id*.
[74] "Wi-Fi Cloud," *supra* note 14.

can download data and receive images that display the gas cloud's direction and speed. Police and fire first responders are able to communicate via Wi-Fi – there's no problem with incompatible radios and frequencies, as happened to the New York City first responders on September 11. If there's a report of a burglary or a fire, first responders rushing to the scene can download floor plans of the building, live images from video monitors, and information about the alarm system.[75]

Police are also now equipped with portable Wi-Fi fingerprint readers that enable an officer to run a person's fingerprint through a multi-state database almost instantly.[76] An added benefit to the community is that officers are able to file their reports wirelessly from the field, meaning their overtime is reduced.[77]

Another homeland security function performed by Hermiston's wireless cloud: the Columbia River Port of Umatilla, one of the largest grain ports in the nation, uses the network to maintain a high-tech security perimeter that will scan bar codes on incoming cargo and provide video surveillance of activity at the Port.[78]

Hermiston's use of ubiquitous wireless broadband for homeland security and public safety purposes is by no means unique. Firefighters, police and medical crews from Milpitas, California to Washington, D.C. utilize wireless broadband extensively, and are lobbying Congress to help improve these capabilities. Other municipalities are experimenting with technologies that can speed up emergency response times and help provide environmental data such as hazardous chemical readings.[79]

In Washington, D.C., where homeland security concerns are paramount, city firefighters, police officers, ambulance crews and other emergency workers are being tied together in a wireless broadband communications network. Doctors in area hospitals will be able to conduct preliminary examinations of patients in ambulances via live video streams. Police officers engaged in high-speed chases will get real-time footage from helicopters. Bomb squads will be able to inspect dangerous sites remotely.[80]

"These are applications that already exist and could greatly enhance the capability of our first responders," says Robert LeGrande, deputy technology officer for Washington, D.C., who is lobbying Congress to set aside more wireless spectrum for public safety.[81]

Edmonds, Washington, is another locality where homeland security and public safety needs drove the installation of high speed broadband. In 2005, the Washington State Department of Transportation (WSDOT) decided to meet its homeland security and public safety requirements by installing video cameras at the Edmonds ferry dock. These

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[75] Nicholas Kristof, "Give Oregon Town High-Five on Wi-Fi," *New York Times*, Aug. 9, 2005, http://www.cwwg.org/nytno08.09.05.html.
[76] *Id*.
[77] "Wi-Fi Cloud," *supra* note 14.
[78] *Id*.
[79] Borland and Hu, *supra* note 17.
[80] *Id*.
[81] *Id*.

required a fiber-optic connection between Interstate 5 and the ferry. In exchange for the public right-of-way - some cables were buried underground, others strung between telephone poles - the state offered the City of Edmonds 24 fiber-optic strands between the dock and Highway 99.[82]

"It's like the state of Washington put in a giant six-lane freeway through the middle of our town," says Bart Preecs, business-development manager for Washburn Communications in Bellevue, and a member of the Edmonds technology-advisory committee. "The capacity of a fiber-optic link is 1,000 times bigger than any other kind of bandwidth."[83]

The city of Edmonds now plans to provide all homes and businesses with broadband speeds of 100 megabytes per second, for data uploads as well as downloads — in other words, bidirectional. The citizens of Edmonds will have high-speed telecommunications at many multiples the speed of the usual telco DSL or cable broadband connections, suitable for the Internet, cable television, telephone services and unimaginable future inventions – a welcome byproduct of the use of broadband for homeland security.[84]

In a recent filing to the FCC, the Benton Foundation aptly stated why universal broadband is so urgently needed to bolster our nation's homeland security and public safety:

> *In a post 9/11, post Katrina communications environment, ubiquitous broadband is a national security imperative. The Internet, designed by the Defense Department to withstand a nuclear attack, has some inherent advantages over traditional communications systems in an emergency. The transformation to a decentralized broadband network with multiple paths between any two points and the Internet's packet of communication protocol enhanced network capabilities, eliminates many single points of failure, and enables the network to automatically and efficiently work around failures. The Internet's inherent network efficiencies were on display on September 11th, prompting the National Academies of Science to find afterwards that the Internet held up better than other communications technologies on that fateful day. Among the thousands of casualties on 9/11 was our outdated communications infrastructure. According to the National Academies, on 9/11 95% of cell phone calls at 11 a.m. failed to get through; the central office for the phone system cut off 300,000 landline phones; television stations were knocked off the air; and police and Fire Department radios failed. In fact, only 2% of Internet addresses remained off-line for an extended period.*

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[82] Diane Brooks, "Edmonds Lights the Way for Broadband," *Seattle Times*, Aug. 8, 2007, http://seattletimes.nwsource.com/html/snohomishcountynews/2003825724_fiberoptics08n0.html.
[83] *Id.*
[84] *Id.*

9/11 demonstrated the Internet's overall resilience to attacks through its flexibility and adaptability.[85]

Katrina, another catastrophic communications failure, highlighted once again how fragile and woefully outdated the emergency communications system in this country has become – demonstrating why we need to take another approach to communications. During Katrina, 38 Public Safety Answering Points (PSAPS) failed, preventing 911 calls from being answered – which public safety leaders say could have been avoided if they had switched to IP-based voice and data communication. Connecting public safety answering points to broadband, like we've connected schools and libraries, is a new post Katrina communications imperative. As FCC Chairman Kevin Martin told the Katrina panel, "I would also like to see a greater use of IP technologies that are capable of changing and rerouting telecommunications traffic. In the event of a systems failure within the traditional network, such IP technologies would enable service to be restored more quickly and would provide the flexibility to initiate service at new locations chosen by consumers."[86]

Universal broadband could also have important advantages for the government itself, allowing government workers to communicate in more geographically dispersed locations in an emergency. In the event of a major 9/11 type attack on Washington, offices could be inaccessible but employees will still need to communicate. Federal workers using broadband-enabled phones could immediately work from home or other broadband-enabled locations – improving continuity of government. Many government agencies are already making the switch to broadband-enabled voice services, but without broadband at home, workers can't connect. The White House flu pandemic plan suggests every business have a plan in place to allow employees to work from home. However, one in four Americans say they likely would lose their job or business if they had to stay at home for seven to 10 days in a severe flu pandemic, according to a new survey. Broadband is an essential ingredient in allowing people to stay connected to work and work from home.[87]

Professor Jon M. Peha of Carnegie Mellon University, an expert on public safety communications systems, recently testified before Congress about the need for a national broadband infrastructure:

When public safety communication systems failed, people can die. We had seen this occur after the 9/11 attacks, after Hurricane Katrina, and in countless large

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[85] Reply Comments of the Benton Foundation, *In the Matter of Federal-State Joint Board on Universal Service and High-Cost Universal Service Reform*, FCC WC Docket 05-337, (June 29, 2007), at 23-4, http://www.benton.org/benton_files/bentonfinal.pdf [hereinafter Reply Comments of the Benton Foundation].

[86] *Id*. at 24.

[87] *Id*. at 25.

and small emergencies throughout the country. Many of these tragic failures are avoidable.

In addition to suffering from much-discussed interoperability problems, the communication systems used by public safety are less dependable than they should be, less secure than they should be, and less spectrally efficient than they should be. Ironically, they are also more expensive than they should be, which means taxpayers pay extra for systems that are unnecessarily prone to failure.[88]

Instead, Peha told Congress: ***First responders should have a single nationwide broadband communications system with technology that is based on open standards. This requires federal leadership.***[89]

Today, the federal government needs to exert the same kind of leadership that enabled America to build a superhighway system that is the envy of the world. In 1956, in the National Interstate and Defense Highways Act, the federal government committed to building a nationwide network of high speed interstate superhighways to better provide for homeland security and national defense.[90] In the same way that these highways went on to spur economic development nationwide, the Hermiston and Edmonds experiences demonstrate that deployment today of broadband technologies that provide for America's homeland security and public needs can also have a tremendously beneficial impact on economic growth and job creation.

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[88] House Subcommittee on Telecommunications and the Internet, *Hearing on Oversight of NTIA and Innovations in Interoperability*, 110th Cong. 1st sess., 2007, testimony of Jon M. Peha, Professor of Electrical Engineering and Public Policy, and Associate Director of the Center for Wireless and Broadband Networking, Carnegie Mellon University, http://www.ece.cmu.edu/%7Epeha/Peha_testimony_public_safety_comm_March2007.pdf.

[89] *Id*. at 2. (emphasis added).

[90] *Federal Aid Highway Act of 1956*, http://en.wikipedia.org/wiki/Federal-Aid_Highway_Act_of_1956 (last visited Sept. 20, 2007).

UNIVERSAL BROADBAND WILL IMPROVE THE QUALITY OF HEALTH CARE AND LOWER ITS COST

We saw a - I met a - where's the doc? Doc, there you are. Good. He's a heart doc - cardiologist, I think, is a more sophisticated way of putting it. (Laughter.)... He worked at - he works at Washington's Children's Hospital. And so he had a patient in - Maryland? Yes. And he was able to - they put a little scan on the little guy's heart, and he was able to assure the mom that this person who had a - had a heart operation when he was a young child is doing well. This healer was able to spread his compassion and talents and assure a mom across broadband technology. It's amazing when you think about it… The quality of life for our citizens is going to improve dramatically as we spread this technology all across America.

President George W. Bush, June 24, 2004[91]

"Telemedicine" via broadband is one of the most compelling justifications for universal broadband. It will allow patients even in remote areas of the country to send information about their pulse, vision, blood pressure, blood oxygenation, temperature, glucose levels, and heart function in real time to physicians and medical staff in locations hundreds and thousands of miles away. Patients and providers can then conference via video over broadband to discuss the results.[92]

For those caring for an invalid, a relative with a condition such as Alzheimer's disease, or a person with a mental disability, universal broadband would allow them to monitor their loved ones from a remote location using a video camera attached to the Internet.[93]

A New Millennium Research Council report found that universal deployment of broadband technology in the U.S. would especially benefit the roughly 70 million Americans who are either over 65 or under that age but have disabilities. Savings from lower medical costs, lower costs of institutionalized living, and additional output generated by more seniors and individuals with disabilities in the labor force were estimated to be capable of generating at least $927 billion in cost savings and output gains over the 25 year period from 2005 to 2030. This amount is equivalent to half of what the United States currently spends annually for medical care for all its citizens.[94]

One compelling example of the possibilities of broadband revolutionizing health care comes from Japan, where pathologists currently use high-definition video and remote-controlled microscopes to examine tissue samples from patients living in areas without access to major hospitals. "Before, we did not have the richness of image detail," says Shoji Matsuya, director of diagnostic pathology at Kanto Medical Center in Tokyo.

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[91] Bush, *supra* note 2.

[92] Alliance for Public Technology, *supra* note 3, at 9.

[93] *Id*.

[94] Robert E. Litan, *Great Expectations: Potential Economic Benefits to the Nation From Accelerated Broadband Deployment to Older Americans and Americans with Disabilities*, 1 (Dec. 2005), http://www.newmillenniumresearch.org/archive/Litan_FINAL_120805.pdf.

"With this equipment, I think it is possible to make a definitive remote diagnosis of cancer." He also notes that Japan has a severe shortage of pathologists, and the remote technology enables them to see more patients more efficiently.[95]

In many parts of the United States, however, such strides in telemedicine may be years or even decades away for two reasons. First, the U.S. does not have universal broadband. Second, in Japan, thanks to superior technology, broadband is eight to thirty times faster than it is in the U.S., enabling Japanese citizens to receive far more advanced services and applications over their Internet connections, including those relating to telemedicine.[96]

UNIVERSAL BROADBAND WILL ENHANCE EDUCATIONAL OPPORTUNITIES AND LOWER THEIR COST

We saw a project there today in northern Pennsylvania, a school in northern Pennsylvania, and it's exciting. Think of the vast potential this will mean for the public school systems of America. It means that some who go without certain subjects can now gain access to those subjects. It will mean we've got a more educated population when we get broadband technology spread throughout the entire country.

President George W. Bush, June 24, 2004[97]

The project President Bush saw was truly impressive, demonstrating how fast broadband can facilitate distance learning programs that provide access to improved educational opportunities for rural students. On that day in June 2004, students at Southern Columbia High School in Catawissa, a town of 1700 in northern Pennsylvania, were connected to a simulated NASA center at Wheeling Jesuit University in West Virginia to participate in a simulated space mission. Utilizing fast broadband technology, a live link between the students and the simulated mission was established, enabling the students to conduct scientific experiments and solve mathematical problems in real time.[98]

At all levels of education, schools are benefiting from the use of high-speed Internet connections for teaching and research. In Cambridgeshire, England, over 200 public schools were connected via fast broadband to the Internet and to each other. Researchers identified many benefits, including:

- Students made more use of the Internet for their own research projects across the whole curriculum.

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[95] Harden, *supra* note 11.
[96] *Id.*
[97] Bush, *supra* note 2.
[98] Richard M. Russell, Associate Director with the Office of Science and Technology Policy in the Executive Office of the President, *Ask the White House*, (June 24, 2004), http://www.whitehouse.gov/ask/20040624.html.

- Teachers were quick to locate relevant educational material on the Internet and made much more use of online resources for their lesson planning, and they incorporated media rich graphics and video content into their teaching.

- Teachers reported improvements in achievement, and levels of confidence and self esteem, particularly as students found that their problem solving strategies bore fruit more rapidly.[99]

Broadband is now an essential tool for higher education as well. Most, if not all, universities are posting course videos and materials online and transforming the way teachers teach and students learn. Online classes, courses and universities make use of broadband's ability to deliver voice and video to broadband-enabled remote classrooms in people's homes.[100]

Even after formal education has ended, workers in today's mobile workforce must be lifelong learners to keep up with developments in their fields or to transition to different fields. Online training courses, like so much other content on the Internet, increasingly require broadband to operate. Broadband enables workers to overcome the barriers of time and distance, and to take training courses from anywhere in the country, at times and at a pace that best suits their needs.[101]

Many see broadband access to the Internet as a means for leveling the radically unequal distribution of educational resources between different school districts, socioeconomic levels, regions, and institutions. "Schools in the low end or in the high end socio-economically need to look the same," says Nick Salerno, an assistant superintendent with the El Monte Union High School District. "We must provide the same opportunity for everyone."[102]

But without universal broadband, we are not providing the same opportunity for everyone. For elementary, middle school and high school students, a lack of broadband access at home can spill over into the classroom. A student who had little or no Internet access or training growing up will be at a significant disadvantage at the college level where Internet proficiency is assumed, says David Matusoff, director of technology planning for Whiteboard Broadband Solutions in Columbus, Ohio.[103]

Indeed, many students are intimidated by most universities' assumption that students are familiar with broadband and computers, and they can be scared away from these particular institutions, says Diane Hobson, the technology instructor at Trimble Middle School in Glouster, Ohio. Without a strong technology background and Internet savvy

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[99] Reply Comments of the Benton Foundation, *supra* note 85, at 19.
[100] *Id.*
[101] Alliance for Public Technology, *supra* note 3, at 9.
[102] Borland and Hu, *supra* note 17.
[103] Eric Hornbeck, "Lack of broadband access creates digital divide in communities," *The Post*, May 31, 2007, http://thepost.baker.ohiou.edu/articles/2007/05/31/news/20366.html.

gained from frequently utilizing the Internet at home over a broadband connection, they may choose not to attend college at all.[104]

Without universal, fast, reliable and affordable broadband, America's "Digital Divide" will also become America's "Educational Divide."

UNIVERSAL BROADBAND WILL BOOST CIVIC ENGAGEMENT AND PARTICIPATION

On July 23, 2007, the candidates for the Democratic Party presidential nomination engaged in a first-of-its-kind presidential debate in which they were questioned not by professional journalists, but by members of the public who submitted their questions on video via YouTube.com. Over 3,000 videos were submitted, and the debate was the second most-watched Democratic presidential debate to date.[105]

The "YouTube Debate" demonstrated on a nationwide stage what communities throughout the U.S. are doing on the local level: using the Internet to engage and serve their citizens, and encouraging them to participate in the political process. Indeed, as communities cut back on cable PEG channels, as Phoenix recently did,[106] or push PEG channels into a more expensive and exclusive cable package, as happened to a million households in the Tampa Bay area,[107] the Internet is taking on an increasing role and responsibility in engaging citizens in the affairs of their communities. Many communities now stream or archive their governmental meetings on the Internet.[108]

But the ability of citizens to use YouTube, and to meaningfully engage in community affairs over the Internet, is entirely dependent on their ability to access the Internet via broadband. And for YouTube, not even what the FCC defines as "broadband" – 200 kilobits per second (Kbps) – is fast enough. YouTube says, "You'll need a broadband connection with at least 500+Kbps for the best viewing experience."[109] This is true for nearly any form of video viewing on the Internet.

Cooper River Courts is a public housing project in Charleston, South Carolina, less than a mile and a half from The Citadel, where the "YouTube Debate" took place. Here, few of the residents own a computer. "I am low-income and computers are not low-income,"

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[104] *Id.*

[105] Brian Braiker, "You Asked, They Answered, More or Less," *Newsweek*, July 24, 2007, http://www.msnbc.msn.com/*Id*/19930669/site/newsweek/.

[106] *Public Access Canceled!* http://www.contactual.net/ap/ (last visited Sept. 20, 2007).

[107] Sylvia Lim, "Local Access Shows Moving," *Bradenton Herald*, Aug. 31, 2007, http://www.bradenton.com/local/story/132857.html.

[108] "City Council Meetings Moving to Channel 10," *Eureka Reporter*, July 16, 2007, http://www.eurekareporter.com/ArticleDisplay.aspx?ArticleID=26276.

[109] *Why Does the Video Keep Stopping and Starting While I'm Watching It?* http://www.google.com/support/youtube/bin/answer.py?answer=56116&ctx=sibling (last visited Sept. 20, 2007).

says Marcella Morris, who is unemployed. "I know how to use a computer. I just can't afford one right now."[110]

Of the few Cooper River Courts residents who own a computer, fewer still have broadband Internet access. Like most youngsters these days, Cooper River Courts resident Tiara Reid, 14, is Web-savvy. She uses her school's Internet access to communicate with her friends and do her homework. But when school is out, without Internet access at home, the library is the only place where she can go to get on the Web. "It's 10 minutes to get to the library if someone drives you. It's 15 minutes if you take the [number] 30 bus. It's about 30 minutes if you walk." Despite the inconvenience, the Internet is too important a part of her life to put on hold for the summer. So she makes the journey to the library to utilize its broadband connection, updating her MySpace profile, sending e-mails on her Yahoo! Account, and, if there is time, surfing Disney.com.[111]

"At one level, the YouTube debate shows that the Web has really become a centerpiece of American political culture," says Lee Rainie, director of the Pew Internet and American Life Project. "At another level, it also shows that the debate is not for everybody. It's certainly not available to all Americans."[112]

LaToya Ferguson, a nail technician in her 30s, is one of the few residents of Cooper River Courts to have Internet access at home. "You're falling behind if you're not online, now that's the truth," she says.[113]

In 2005, Charleston officials announced a plan to build a citywide Wi-Fi grid to provide broadband Internet access to all Charlestonians, including the residents of Cooper River Courts. But, as in other cities, the Charleston Wi-Fi project has bogged down and may never happen.

Says Marcella Morris, "I could take my kids to other places on the Internet. Sometimes I feel shortchanged. Not envious, but shortchanged."[114]

That the broadband-required YouTube debate took place so close to the broadband-denied Cooper River Courts starkly illustrates the "Digital Divide" that exists not only in Charleston, but across our nation. And many argue that in the past ten years since the term "Digital Divide" was coined, the situation has only gotten worse.

"I would argue that the digital divide is worse than it was 10 years ago," says Andrew Rasiej, a member of a panel studying universal Internet access in New York, and co-founder of TechPresident, a nonpartisan blog that tracks the online campaign. "Back

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[110] Jose Antonio Vargas, "Binary America: Split in Two by a Digital Divide," *Washington Post*, July 23, 2007, at C01, http://www.washingtonpost.com/wp-dyn/content/article/2007/07/22/AR2007072201278.html.
[111] *Id.*
[112] *Id.*
[113] *Id.*
[114] *Id.*

then everyone - schools, businesses - was trying to get online. These days every single Fortune 500 company has its employees, its customers and its suppliers connected 24 hours a day, seven days a week. In the meantime, while our students have online access at school, many of them don't have it at home."

The *Seattle Times* recently editorialized that, "[N]ot only does the U.S. risk falling behind its partners and competitors, a large swath of American voices will disappear if broadband is left to network providers. That's a great loss for a democracy."[115]

Our nation is actually right now widening the Digital Divide, making it increasingly difficult for "have nots" to meaningfully engage and participate in community affairs. In effect, without universal broadband, America risks relegating the "have nots" to second class citizenship.

UNIVERSAL BROADBAND WILL INCREASE ACCESS TO – AND PARTICIPATION IN - JOURNALISM, CULTURE AND ENTERTAINMENT

We live today in the early phases of a tremendous media revolution that some compare to that launched by Gutenberg in 1448.[116] Prior to the Internet, production and distribution of media was expensive, technically difficult, time consuming, and financially risky. Today, the Internet and digital media tools enable citizens to create their own media content.

Suddenly, ordinary citizens are producing and distributing their own works of journalism, culture and entertainment. Research shows more than half of America's teenagers create content for the Internet – text, pictures, music, and video.[117]   As *The Economist* notes, we are entering an "Age of Participation" culture:

> *…people no longer passively 'consume' media (and thus advertising, its main revenue source) but actively participate in them, which usually means creating content, in whatever form and on whatever scale… What is new is that young people today, and most people in the future, will be happy to decide for themselves what is credible or worthwhile and what is not. They will have plenty of help. Sometimes they will rely on human editors of their choosing; at other times they will rely on collective intelligence in the form of new filtering and collaboration technologies that are now being developed. "The old media model was: there is one source of truth. The new media model is: there are multiple*

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[115] "…Build Broadband," *Seattle Times*, Sept. 17, 2007,
http://seattletimes.nwsource.com/html/editorialopinion/2003885128_broded16.html.
[116] "What Sort of Revolution?" *The Economist*, April 20, 2006,
http://www.economist.com/surveys/displaystory.cfm?story_*Id*=6794256.
[117] "Among the Audience," *The Economist*, April 20, 2006,
http://www.economist.com/surveys/displaystory.cfm?story_*Id*=6794156.

> *sources of truth, and we will sort it out," says Joe Kraus, the founder of JotSpot, which makes software for wikis.[118]*

Citizen blogs, podcasts, journalism, restaurant and movie reviews, YouTube videos that question candidates, documentaries, films, even shows that look a lot like television – creating all of that is now being done every day by Americans who have broadband access to the Internet.

Yet, as *The Economist* notes:

> *…full-scale participatory media presume not so much the availability of the (decades-old) internet as of widespread, "always-on", broadband access to it. So far, this exists only in South Korea, Hong Kong and Japan, whereas America and other large media markets are several years behind…*

> *The obvious benefit of this media revolution will be what (Paul) Saffo of the Institute for the Future calls a "Cambrian explosion" of creativity: a flowering of expressive diversity on the scale of the eponymous proliferation of biological species 530m years ago. "We are entering an age of cultural richness and abundant choice that we've never seen before in history. Peer production is the most powerful industrial force of our time," says Chris Anderson, editor of* Wired *magazine and author of … "The Long Tail"…[119]*

As *The Economist* correctly notes, the crucial prerequisite for widespread citizen participation in this oncoming media revolution is universal, high speed, always-on access to the Internet. Without that access, America's Digital Divide will also be America's "News, Information, Culture, and Entertainment Divide."

UNIVERSAL ACCESS MUST ALSO BE OPEN ACCESS

It's one thing to make sure broadband is spread out in America, but we want consumers - in this country, we believe in giving consumers alternatives. If you have an alternative, you're likely to get a better price and a better quality.

> *President George W. Bush, June 24, 2004[120]*

We have illustrated the vast potential for universal broadband to boost economic productivity and job growth, and to improve the quality of life of so many Americans. But many of these extraordinary benefits may never come to pass if the broadband that is ultimately deployed is also not "open" to all content providers on a nondiscriminatory basis so that consumers have an equal opportunity to access all the content on the Internet.

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[118] *Id.*

[119] *Id.*

[120] Bush, *supra* note 2.

Today, as a result of misguided regulatory decisions in Washington, the rules have changed and broadband providers no longer must provide their customers with access to the entire Internet. Instead, they now have the power to control where their customers surf and on what terms, and to which Internet content providers they will allow access and on what business terms. In other words, broadband providers are free to offer their paying content consumers access to only those content providers and websites that are also willing to pay them, or in which they have a financial interest. Such a proprietary "closed" collection of websites will fall far short of giving customers access to the full "open" Internet.[121]

In a competitive marketplace for broadband Internet access, this would not matter so much. Consumers who did not care to subscribe to broadband service from one provider that offered only a limited proprietary "Internet" could take their business elsewhere and subscribe to another broadband service that provided access to the real and entire Internet.

But over 98 percent of Americans subscribe to high speed Internet access from either a local cable or a telephone company, and most of these companies refuse to commit to offering a nondiscriminatory Internet experience. In many areas of the country, consumers have only two choices for broadband: either the local cable or telco monopoly. In many other parts of the country, consumers have only one broadband "choice."[122] And, in those areas of the country without access to broadband, it is highly doubtful that more than one broadband provider will provide future service in that area.

Taken together, today's reality is that for many if not most Americans, the marketplace for broadband is not competitive, and will not be competitive for the foreseeable future. This is especially true where broadband is not presently available.

Broadband providers have the power to become extremely powerful "gatekeepers" for all kinds of Internet content and services. The Internet they provide may bear more resemblance to a cable television system with a limited set of website "channels" than the wide open Internet we enjoy today. Some analysts believe this "closed" Internet model will resemble the early "walled garden" days of America Online and pre-1997 TCI, when customers were limited to AOL content or restricted from video channels which TCI did not want to carry for selfish reasons. Later, when competition came to AOL in the form of the Internet, consumers expressed a clear preference to the wide open Internet over the closed AOL "walled garden." But without broadband competition allowing consumers to choose for themselves what content they want, their only broadband service may be

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[121] *See* Center for Creative Voices in Media, Comments to FCC in *AT&T Inc. and BellSouth Corporation Applications for Approval of Transfer of Control*, WC Docket No. 06-74, (Oct. 24, 2006), http://www.creativevoices.us/cgi-upload/news/news_article/CVFCCATTBLSCommentCOMPLETE102406.pdf.
[122] Industry Analysis and Technology Division, FCC Wireline Competition Bureau, *High Speed Services for Internet Access: Status as of June 2005*, (June 2006).

either the walled Internet garden of the cable company or the walled Internet garden of the phone company.

Without a legislated and/or FCC-required open access requirement, broadband service providers will have the power to pick and choose whether communities will have the broadband access necessary for jobs and development; which telemedicine applications will have access to consumers and which will be shut out of the market; whether citizens can access and participate in community meetings online; which educational institutions can offer online learning; what businesses can do over their broadband access; which videos consumers can upload or download, and at what price; and so on and so on. Without an open Internet, whatever the Internet can be used for will be largely under the control of one or two monopoly-like broadband service providers, not consumers acting in a free and open marketplace.

The implications of whether the Internet will be "open" or "closed" can hardly be overstated. FCC Commissioner Michael J. Copps observes, "This Internet may be dying. It may be dying because entrenched interests are positioning themselves to control the Internet's choke-points and they are lobbying the FCC to aid and abet them… We seem to be buying into a warped vision that open networks should be replaced by closed networks and that traditional user accessibility can be superseded by a new power to discriminate. Let this vision prevail and the winners will be entrenched interests with far greater power than they have today to design and control the Internet of the future."[123]

If the cable and telephone companies that monopolize the provision of broadband Internet access succeed in establishing themselves as toll collectors on the information superhighway, the result will be an Internet that never fulfills its potential for economic development, job growth, and so many other improvements to the quality of Americans' lives as we have described above.

Today, consumers with broadband have the freedom to provide content and access content over an open broadband system – the hallmark of a free market. But if cable and phone company broadband service providers have their way, they will control that market, based not on consumers' and communities' interests, but on their own narrow economic interests. They will have simply replaced the old cable video monopoly with a new Internet access monopoly, but this time with even more adverse consequences to an open and democratic society. And seldom are these companies' interests aligned with the broader communities' economic development and job creation interests.

Therefore, broadband access in our nation must be universal and it must also be open. Indeed, universal broadband access to the Internet cannot mean merely providing every American with the opportunity to connect to a broadband provider's proprietary "crabbed" collection of toll-paying websites. Rather, it must mean providing every American with the opportunity to access, without discrimination, all the content and applications on the entire Internet.

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[123] Michael J. Copps, Commissioner, FCC, *The Beginning of the End of the Internet?* Remarks to The New America Foundation (Oct. 9, 2003), http://fjallfoss.fcc.gov/edocs_public/attachmatch/DOC-239800A1.pdf.

AMERICA WILL NOT ACHIEVE UNIVERSAL BROADBAND RELYING SOLELY ON THE PRIVATE SECTOR

This effort, by the way - the reason Ann is here, Ann Veneman is here, is because the effort was launched by the Department of Agriculture. That may be a hard one to explain at home. (Laughter.) But the reason why is, is because her job is to give grant and loan programs for rural development. And it makes sense to - (applause.) And she spanked out $2.5 billion of loans and grants for rural development. A lot of people in rural America like living there. (Laughter.) The quality of life is really good.

President George W. Bush, June 24, 2004[124]

Some argue that free markets will provide the "right" amount of broadband to Americans, and therefore no national broadband policy or federal initiative to ensure universal broadband access is necessary or desirable.[125] But, as we have seen, broadband will produce tremendous economic benefits to our nation. Moreover, it is increasingly a necessity for full participation in modern American life and an enabling technology that improves productivity and quality of life and ensures equal opportunity for all Americans.

Thus, broadband should be considered not as a consumer "service" or "convenience," such as a DVD player or a cable television subscription, but as a capital investment in a vital and necessary public service, just like electric and telephone service and paved highways. A farsighted national broadband policy would not merely be devoted to filling in "gaps in broadband coverage" where there has been a "market failure." Rather, because it is a wise economic and social investment that for generations will reap benefits that dwarf its costs, it should promote fast, reliable, affordable and open broadband in every corner of our nation.

As private companies have deployed broadband, they have deployed it first in lower cost, higher income areas where they project subscription rates and take-up will be highest. As these companies are in business to maximize profits for their shareholders, this makes sense and is to be expected. But for society as a whole, as economist Robert D. Atkinson writes in *The Case for a National Broadband Policy*, "[t]o the extent that some Americans cannot afford broadband access or cannot subscribe to it, there is an equity argument that can be made for a government role to ensure widespread adoption…." This is one reason the government should "do more to spur deployment and take-up in high-cost areas or by low-income individuals."[126]

But Dr. Atkinson also describes a second and equally important reason for the nation to achieve a goal of fast, reliable, affordable, and universal broadband: the significant "positive externalities" it will generate for our nation's economy and society. Economists define "positive externalities" as benefits above and beyond those for which

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[124] Bush, *supra* note 2. At the time, Ann Veneman was Secretary of Agriculture.

[125] Atkinson, *The Case for a National Broadband Policy*, *supra* note 3, at 5.

[126] *Id.*

compensation is paid or received; in other words, benefits that accrue to society and not just to the particular individuals in an economic transaction. Therefore, where positive externalities exist, the competitive marketplace, made up of individuals conducting transactions, will not achieve what is optimal for society as a whole. The classic example of an externality, in this case a negative externality, is pollution: a company's air pollution imposes costs on its neighbors that are not paid for. In the case of positive externalities, it is in society's interest to intervene to provide more of the good creating the benefit than individuals will do on their own.[127]

Such is the case with broadband. Dr. Atkinson describes four positive externalities that justify social investment in universal broadband:

- Network Externalities

- "Prosumer" Externalities

- Competitiveness Externalities

- Regional Externalities[128]

Network Externalities

Telephone service is a classic example of a network externality – the telephone network is more valuable to a user when more and more people are connected to it. Telephone network positive externalities have been a primary rationale for the nation's policy commitment to universal telephone service. But, as Dr. Atkinson writes, "broadband externalities are likely to be even more significant (than those derived from the telephone network), in part because broadband will enable new services to emerge that will benefit broadband users."

Like the telephone network, broadband benefits will become more valuable to the entire population as more individuals and businesses use broadband. This is a direct positive externality.

In addition, there are significant indirect network externalities generated by universal broadband. High bandwidth applications such as streaming or downloadable video, or telemedicine, require a high base of broadband subscribers to become viable businesses. But a "chicken-or-egg" problem exists – deployment of broadband will become wider when these exciting new applications are available, but these applications will not become available without a widespread deployment of broadband.

> *More high-speed broadband would spur the development of a whole host of new applications that are not viable now in the low speed world. While some of these*

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[127] *Id.*
[128] *Id.* at 6.

> *we can imagine (e.g., Internet-based "TV," video telephony and applications like tele-medicine) others surely will burst onto the scene as the "next new things."*[129]

"Prosumer" Externalities

Dr. Atkinson writes that broadband technology gives consumers access to the digital economy where they become both producers and consumers. Or, as the futurist Alvin Toffler termed them, "prosumers." An example of a positive prosumer externality is the role that broadband plays in telemedicine, not only improving health care outcomes, but also lowering health care costs. With access to telemedicine, older and disabled Americans can remain in their own homes, substantially saving on hospital and residential care facilities costs.[130]

Widespread deployment of broadband, according to economist Robert Litan, can save at least $927 billion by 2030 in the care of seniors and disabled persons by directly lowering health care costs, postponing or eliminating the need for institutionalized care, and making possible increased workforce participation from home.[131]

Telecommuting by workers is another example of a positive prosumer externality. Broadband means less use of transit, highways and energy, not to mention less pollution, all of which promotes societal welfare. Telecommuting has also been shown to boost worker productivity, which lowers prices and further benefits society.

Other examples cited by Dr. Atkinson include increased distance learning, more efficient e-commerce and e-government, easier online volunteering, and greater opportunity to work from home on flexible schedules.

These prosumer benefits, notes Dr. Atkinson, "don't just accrue to the individual broadband prosumers; they spill over to society as a whole.[132]

Competitiveness Externalities

The countries that are leading in broadband deployment are, according to Dr. Atkinson, "translating that lead into increased competitive advantage for domestic IT companies." He cites South Korea, where fast and universal broadband has made that country a "test-bed for the next generation of Internet-based services and products," which has enabled South Korea-based Samsung to become a world leader in IT technology and given birth to a world-class online gaming industry that sells over 50 percent of the online games bought in neighboring China.

As Dr. Atkinson notes: "Leadership in broadband is important for maintaining high standards of living and national competitiveness."[133]

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[129] *Id.* at 6-7.

[130] *Id.* at 8.

[131] Litan, *supra* note 94.

[132] Atkinson, *supra* note 3, at 8-10.

Regional Externalities

As we have seen above, the lack of broadband in a region is a determining factor when businesses decide where to locate. To the extent that businesses avoid rural regions where broadband is unavailable and move to crowded and expensive metropolitan regions, substantial costs are added in that region. In addition, the costs of goods and services can increase from what they might otherwise be if produced in the lower cost rural area. "Ensuring that these latter places have robust broadband is an important component of any national balanced growth strategy."[134]

Just as importantly, says Dr. Atkinson:

> [B]roadband boosts the quality of life in rural communities, making it easier for them to attract and retain residents. Broadband, and the applications that it enables, is giving all Americans more choice, but it's a special boon to the 60 million Americans who do not live in large metropolitan areas.... A rancher in the middle of Wyoming has the same selection of music and books through iTunes and Amazon as anyone in New York. Even the services once thought to be non-traded, or impossible to export beyond the immediate market, such as doctor appointments and college education, are increasingly traded through IT so as to reach remote areas. Many schools have created online courses, while others, like MIT, have posted course materials online. Telemedicine can give rural patients the same access to care as the patient living in a major metropolitan area.[135]

Because it does not directly profit from these positive externalities, the private sector will not deploy broadband universally, just as it has not deployed telephone or electrical service universally. Therefore, the public sector must step up and make the deployment of universal broadband a national priority, while taking an active role in ensuring that all Americans have the opportunity to subscribe to fast, reliable, affordable and open broadband access to the Internet.

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[133] *Id.* at 10-11.

[134] *Id.* at 11.

[135] *Id.* at 11-12.

CONCLUSION AND RECOMMENDATIONS

> *The fundamental question is, what do we need to do to make sure we're not only strong today and tomorrow, but for the decades to come? That's the real challenge that those of us in government face.*
>
> *President George W. Bush, June 24, 2004*[136]

In June 2004, speaking at the Department of Commerce in Washington before cabinet secretaries, legislators and federal workers, President Bush challenged all in federal government to "make sure we're not only strong today and tomorrow, but for the decades to come" by deploying universal, affordable broadband in every corner of our nation by 2007.[137]

Unfortunately, as we near the end of 2007, it is clear that the federal government has failed to achieve this goal, and Americans will not enjoy the benefits of fast, reliable, affordable, universal broadband this year, or any time soon.

Meanwhile, as precious time has passed, the need for – and benefits from – universal broadband have become even more obvious, and even better documented.

Without further delay, America must:

- *Develop a comprehensive national broadband strategy to enable affordable broadband access for every American within three years. Such strategy should include benchmarks, deployment timetables, a commitment to "consumer demand" drivers, and measurable thresholds.*

- *Modernize the Universal Service Fund (USF) to: (i) specifically include and cover broadband service; (ii) uniformly assess all communications providers (telephone, cable and wireless); and (iii) support first responder interoperable communications and "Public Safety Answering Points" (PSAPs).*

- *Provide telcos and cable video providers with a standard national franchise agreement which would: (i) mandate nondiscrimination in building out broadband networks and speeds that, for all Americans regardless of where they live, enable on-line learning, telecommuting and telemedicine and provide broadband-enabled voice and video competition; (ii) maintain fees to municipalities; and (iii) oblige video providers to make available public, education and government (PEG) channels. (Enforcement of any franchise agreement should, however, continue to reside with the respective local franchise authority (LFA), since LFAs are best positioned to ensure that community needs and interests are addressed and that video providers satisfy their obligations within established federal limits.)*

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[136] Bush, *supra* note 2.
[137] *Id.*

- *Charge the Federal Communications Commission (FCC) with taking all necessary steps to ensure that its rules and regulations encourage and promote more efficient and timely use of currently unused and underused spectrum, particularly in unserved and underserved regions and communities.*

- *Prohibit telcos and cable companies from layering onto their broadband access service offerings, over any part of their respective networks, user application surcharges or unreasonable operating limitations (such as blocking or degrading) in order to discriminate, for anticompetitive reasons, against third party Internet content and/or services and applications (i.e., full "Internet neutrality").*

Ever since its founding, America has enjoyed extraordinary economic and social development that has coincided with the federal government's commitment to public investments in commerce, power distribution, transportation, water management, and communications.[138]

Today, as Thomas Friedman has written, Americans increasingly live in a world gone "flat," as high speed Internet connections boost global competition by making borders, distance and even language irrelevant in the increasingly interconnected world economy.[139]

To meet this challenge, our federal government must renew its commitment to public investment and leadership. It must undertake a concerted national effort to deploy fast, reliable and affordable broadband to every corner of our nation. As has been true of federal efforts to spread telephone and electric service and build a vast network of superhighways, the benefits to our society of this investment will vastly outweigh its costs. Our nation will jump-start hundreds of billions of dollars of economic growth, create over a million high-paying new jobs, and improve the quality of life of our citizens. We will stop falling farther behind our international competitors, secure our leadership in global technology, enhance our homeland security and public safety, and provide all of our citizens with the opportunity to participate in the new, global, networked 21st Century economy and society.

How well our nation's leaders rise to this challenge will substantially determine whether America is "not only strong today and tomorrow, but for the decades to come."

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[138] *Horizon Project: Report and Recommendations*, 17, (Feb. 2007), http://www.horizonproject.us/images/FE/chain206siteType8/site175/horizon_final_0123.pdf.
[139] Thomas L. Friedman, *The World is Flat: A Brief History of the Twenty-first Century* (2005).