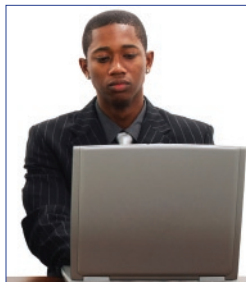
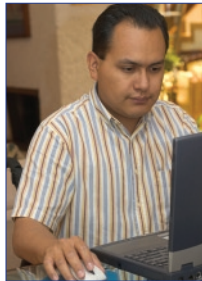


UNIVERSAL AFFORDABLE BROADBAND FOR ALL AMERICANS

How to Modernize Universal Service
for the 21st Century and Connect Americans
to a New Era of Digital Opportunity



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By Jim Kohlenberger, Senior Fellow, Benton Foundation

September 2007

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INTRODUCTION

For more than 200 years, Americans have approached the future the same way that Huck Finn looked at the bend in the river: even though we didn't know for sure what was coming next, we always had a sense of limitless possibility about where we were going and where it could take us. Americans, whose ideas have changed the world, are the ones who have been able to see around that bend, catch a glimpse of the future, capture its potential, and ensure that all Americans can partake.

Today, as we reach a new bend in the river, we must strive once again to look around that bend in order to harness the full power and potential of what the future may bring. Never before have we seen a river of opportunity as expansive or swift as the data that flow over the Internet. The opportunities are potentially endless and as significant as the invention of the steam power and electricity that fueled American prosperity at earlier junctures. But America's digital prosperity won't happen by accident, nor continue by inertia. It will only happen if we make pragmatic and smart choices about our communications future.

This digital river we call broadband—high-speed Internet service—is the tool that can quench our thirst for economic progress. As a recent United Nations report found, broadband Internet access is becoming as vital for success as access to water and electricity.¹ “But just as new technologies create more opportunity, they also can create more inequality. Like access to water and electricity, America must ensure that this new digital river reaches those who stand to benefit most at speeds that flow faster than today's trickles.”

This digital river we call
broadband—high-speed
Internet service—is the tool
that can quench our thirst
for economic progress.

Yet today's broadband network is far from ubiquitous. It doesn't yet reach far enough into the communities and living rooms where it can have its biggest impacts. In addition, while today's broadband network is faster than dial-up Internet, it is still not fast enough to unleash the opportunity that can flow from robust broadband speeds.

When steam technology was first developed, both the French and the British had it at the same time. The French used it to pump water into royal fountains—benefiting only a few. The British used it to power the Industrial Revolution and help them become a global powerhouse. We now face similar choices about how we harness this new technology and use it to continue our prosperity in this digital revolution. Today, our future is unfolding at a breathtaking rate. But what is different in this journey than at previous turns is that America is falling behind without a plan for harnessing broadband's extraordinary potential.

In today's digital revolution, the French and 15 other industrialized nations around the globe are leveraging the power of broadband to catapult them forward as Information Age leaders. They are adopting pragmatic policies that extend broadband to a greater share of their population. They are adopting policies to transition away from yesterday's limited analog phone networks and embracing broadband as a way to deliver voice, video, and data all over a single connection. This is one of the few times in modern history where America was the cradle for invention of a new technology—the Internet—but allowed its leadership position to be overtaken by other nations with pragmatic policies. It must stop here.

We can learn from the lessons of the past. After the Industrial Revolution America leaped ahead into the winner's circle with the help of policies to advance universal telephone service—it made America more competitive by connecting us together. At the dawn of the Digital Age, we face a similar challenge in cultivating the power of universal access to communications to ensure that broadband benefits all of America's hard-working families, and not only a privileged few.

This challenge demands that we chart a new course that embraces fundamental Universal Service policy change. Our current trajectory and speed simply will not get us there. Short-term bandaids will not get us there. But bold choices can.

MOVING FROM NATIONAL GOAL TO EFFECTIVE STRATEGY

America is on the verge of a vast new broadband-driven digital transformation that promises to make life more livable, businesses more productive, jobs more plentiful, and the Internet more accessible. However, at the dawn of this Digital Age, those who could benefit the most from this economically empowering technology are also those most likely to be left without access because of where they live or how much money they make.

As Congress and the Federal Communications Commission (FCC) put Universal Service reform at the top of their telecommunications policy agendas, this series of papers advances a new vision for Universal Service—to make broadband as universal as telephone service is today. The papers provide a pathway for the United States to retake the lead as a broadband leader. Through a series of thought-provoking and provocative papers, this project outlines the policy rationale and 12 key steps for advancing universal broadband and modernizing the Universal Service program for the Information Age.

These papers explore the premise that universal broadband access is now as important to the advancement of the American ideal in the 21st century as universal access to education, water, electricity, and universal phone service were in the last. Broadband is now becoming an essential utility, and no longer can be seen as a discretionary luxury. Together, some of America's foremost Universal Service policy experts outline the policy steps necessary for achieving the goal.

THE PROMISE AND THE CHALLENGE

Broadband is now becoming vital to personal success. Many only know broadband as a faster version of their slow dial-up Internet connection. However, broadband is so more. High-speed Internet connections provide a constant, unbroken connection to the Internet. It's not only about checking email or surfing the Web; it will soon be an indispensable communication technology affecting the way we learn, the way we work, and the way we communicate. According to a survey of United States and Canadian consumers, all demographic segments rated broadband "the communication service they can least live without."² Soon broadband will offer the most affordable conduit for making phone calls to anywhere in the world, deliver the video and audio programming we want where and when we want it, and allow us to remain connected to friends, family, and co-workers—even when we leave the home or office. All of our basic communications—be they text, audio, or video—will soon require a single broadband connection. Lack of access to the tool doesn't only mean being disconnected from the Internet. It will mean being disconnected from the economy, from society, and from the benefits of the Digital Age.

Broadband is so essential, President George W. Bush set an ambitious and important goal of universal access to broadband by 2007. However the President hasn't yet created a coordinated national strategy to achieve this goal beyond mere reliance on market forces.

AMERICANS ARE GETTING LEFT BEHIND WITHOUT THE TOOLS TO SUCCEED IN THE 21ST CENTURY

America is falling further behind among industrialized nations in broadband. Once a technology leader in the Internet revolution, the United States has now fallen to 16th among industrialized nations in deploying broadband services. In some places like Japan, Iceland, South Korea, and the former Yugoslav republic of Slovenia, consumers get Internet connections for the same price most Americans pay that are significantly more powerful than what is available in the United States. Some countries are now rolling out ultra-high-speed access that is 500 times faster than what the FCC defines as “broadband.” And despite the initial rapid uptake of broadband services in the United States, recent data suggest broadband adoption here is slowing. This trend, combined with the apparent overall slowing of household Internet adoption, should be cause for national concern.

We are falling behind on access, speed, and prices.

- Americans often pay twice as much for connections with $\frac{1}{20}$ the speed.
- Singapore has a plan to offer its residents one gigabit per second by 2015. You can already get 100 megabits per second in Denmark, Japan, Romania, Iceland, Slovenia, Dubai, parts of Kuwait, and in cities such as Paris and Prague. In fact, in Iceland, you can get it for \$26 a month.³
- According to the FCC, half of all U.S. broadband connections are slower than 2.5 megabits per second. The FCC’s 200 kbs broadband definition is roughly six times slower than universal standards.
- The International Telecommunication Union’s Digital Opportunity Index now ranks the United States at 21st, right after Estonia and tied with Slovenia

THIS IS OUR GENERATION’S SPUTNIK MOMENT

Fifty years ago America faced a similar challenge. In October 1957, America looked into the skies and saw our scientific leadership in the world fall from first to second as Sputnik crossed the night sky. We looked overhead and saw our competitor racing ahead of us in the critical technology of the day. We understood that satellites would unleash a communications revolution which would ultimately prove critical for our ability to transmit phone calls, extend communication’s reach into the far corners of the country, transmit television, and retain our nation’s economic and national security leadership. In one moment, Sputnik grabbed America’s attention and we rallied the nation’s

resources around a comprehensive strategy to regain our technological leadership. President Dwight D. Eisenhower rallied American scientists and engineers, forming both NASA and an advanced research agency. The post-Sputnik sense of urgency powered American innovation for decades, igniting the growth of the country’s infant semiconductor and computer industries and laying the foundational technologies for the Internet. As a result, America unleashed unprecedented technological advances that built the world’s most vibrant economy.

This is now our new Sputnik moment. Instead of slipping to 2nd place, we have slipped to 20th. Just as Sputnik forced us to ask how we can regain our lead in outer space, today we must ask how we can regain our lead in cyberspace.

Some in the Bush Administration say America is not behind in broadband. They say that size matters. They point to the rankings which measure connections per inhabitants (where America is falling behind) and argue a better measure is the total number of broadband connections a country has. By total number of broadband connections, America may in fact be ahead—for now. But within weeks, if not days, China is expected to have more total broadband connections than does the United States

Others argue that when it comes to the President’s broadband goal—broadband available everywhere in the nation by 2007—it is already a mission accomplished. They cite data suggesting that since at least one person in every zip code has the opportunity to purchase a 200 kbs “high speed” service, the goal has been met. It’s just that people have chosen not to purchase broadband, they argue.

BUT IT IS CLEAR AMERICANS ARE GETTING LEFT BEHIND

- Half of Americans lack access. Too few of us have broadband connections, and those who do pay too much for service that is too slow. Many households are hostage to a single broadband provider, and nearly $\frac{1}{10}$ have no broadband provider at all. Only about 50 percent of United States households subscribe to broadband services, reflecting too few choices, too high prices, and too limited service. According to Pew, an estimated 31 million U.S. households do not have Internet access at all.
- Broadband adoption is highly dependent on socio-economic status. Almost 60 percent of households with incomes above \$150,000 have a broadband connection,

Girls, when I was growing up, my parents used to say to me, ‘Tom, finish your dinner—people in China and India are starving.’ My advice to you is: Girls, finish your homework—people in China and India are starving for your jobs.

—*Thomas Friedman,*

to his daughters in The World is Flat

while less than 10 percent of households with incomes below \$25,000 have a connection.

- The gap between rural and urban America persists. The broadband penetration rate in urban and suburban households is almost double the rate in rural areas. Though growing, rural Internet penetration has remained roughly 10 percentage points behind the national average. It is critical that the 25 percent of Americans who live in the rural areas of the United States are not left behind in this increasingly information- and technology-driven economy. For example, the Government Accountability Office has indicated that while about 30 percent of households in urban and suburban areas have access to broadband, only 17 percent of rural households have access.
- A persistent digital divide separates Americans. About 50 percent of African-Americans and 50 percent of Latinos own home computers, as compared to 75 percent

of whites. Forty-one percent of African-Americans, 38 percent of Latinos, but 67 percent of whites, have Internet access at home. Furthermore, Internet growth exhibits minimal increases in penetration, with approximately 25 percent of households not likely to come online in the foreseeable future.

The United States pays a heavy competitive cost for our broadband shortcomings. Our economy pays a competitive cost. Our children will pay when they have to compete with others from around the globe. Our personal well-being suffers when we lack the latest productivity-improving technologies that are critical to our ability to raise living standards. By one estimate, \$1 trillion could be lost over the next decade due to constraints on broadband development.

Every American should have the ability to compete and win in the 21st century economy with broadband. In the last century, America became an economic powerhouse by ensuring that every American had equivalent tools. Congress pursued ideals such as expanding universal access to electricity, basic phone services, and education as the key enablers of American empowerment in yesterday’s economy. The equivalent equalizer in today’s digital economy is universal access to broadband. It is not only a tool for communications and an enabler for every other future digital communication—from TV to telephone service—it’s essential for learning, working, and thriving.

Because broadband is a two-way medium, broadband access is also about being heard, being able to exercise creative expression, and being able to maximize one’s own personal potential without regard to geography or economic circumstance. Broadband is not only about communicating; it’s about creating a nationwide human network that connects us each other. Unlike radio or television, the Internet unites us. Or it can divide us. Which way it goes depends on how we use it.

UNIVERSAL BROADBAND BENEFITS

MOVING FROM SAFETY NET TO TRAMPOLINE

The federal Universal Service Fund (USF) has provided a safety net for connecting communities and those struggling to get by with affordable telephone service. As technology advances, it's now time to modernize USF for the Digital Age. Modernizing the USF for broadband isn't only about patching holes in a safety net program. It's time to move beyond thinking about universal service as merely a safety net and begin thinking of it more as a trampoline that can catapult us into a new world of opportunity. A broadband driven global economy demands a system of supports that not only catch people when they fall, but can help propel all of us into the new jobs, careers, and opportunities that a digital future brings.

THE BENEFITS OF UNIVERSALLY AVAILABLE BROADBAND ARE ENORMOUS

For Consumers

The Internet has already transformed the way we live, work, and play. 31 billion emails are sent each day.⁴ More than 12.4 million Americans telecommute full-time,⁵ and already more than 14 million Americans have placed a telephone call over the Internet.⁶

But the best is yet ahead. With broadband:

- Students can complete a university degree online.
- All Americans, no matter where they live, can be no more than a keystroke or a mouse click away from the jobs and opportunities that broadband both creates and supports.
- Doctors in urban areas can diagnose patients in rural areas or consult with experts from around the globe.
- Employees from around the world can collaborate on projects in real time or gain “on-demand” skills as they need them.
- Citizens can register their cars, buy fishing licenses, and pay parking tickets online, saving time and money.
- People can play a greater role in democracy as blogger, online activist, or movie creator.
- Consumers can benefit from competition in more cost-efficient voice and video services—lowering costs but increasing choices.
- Children in the most isolated inner-city neighborhood or rural region can access the same universe of knowledge

as a child in the most affluent suburb—transforming the way teachers teach and students learn.

- Parents can keep on top of their child's homework and be in contact with their teacher.
- Computer professionals can repair their client's software glitches virtually.
- Seniors can take advantage of remote health monitoring technologies and live independently.
- Children can take language or piano lessons from experts around the globe with the help of voice and video software.
- A shop owner with a good idea and an Internet connection can become a corner store in the global economy.
- And anyone with a computer can become a reporter, broadcaster, movie producer, or musician.

For Rural Americans

Nowhere is broadband opportunity as profound as it is in rural America. It can bring jobs, deliver economic opportunities, and reconnect distant families. A broadband transformation can enable consumers to bridge the distance between urban and rural America, people to do things never before thought possible, businesses to transform the way they do business, rural communities to connect to a new world of remote job opportunities, and rural economies to become an engine for higher-paying Information Age jobs. However, in too many rural communities, because jobs have migrated to urban areas, high school graduates often feel they have only two choices—go away or go nowhere. Broadband will radically change these dynamics by making it easier for rural Americans to connect to higher-paying jobs without moving out of town. Small businesses can reach new markets. Already big businesses are utilizing broadband to “in-source” jobs to rural America rather than “outsource” jobs abroad. Further expansion of broadband access to rural markets may help shrink the urban–rural wage gap by allowing highly paid workers to move to more remote areas, and rural Americans to access higher-paying urban jobs.⁷ Broadband can deliver online learning and job opportunities that enhance modern rural life. The future should not be to deny rural Americans access to these transformative technologies, but to ensure that rural Americans can take full advantage of their benefits.

For the Economy

Ubiquitously available broadband could

- unleash an estimated \$500 billion in economic growth,
- create more than 1.2 million high-wage jobs,
- restore America's global competitiveness,
- boost business productivity—which is essential to raising standards of living for all families in America,
- allow small businesses to reach global markets.

For People with Disabilities

Broadband is an especially promising technology for the 54 million Americans with disabilities—able to provide breakthrough benefits not possible in today's legacy phone network. As all Americans increasingly depend on email and the Internet to work and communicate, it becomes even more important to ensure that people with disabilities are not left out of the digital revolution. Broadband Internet is a more inclusive technology than the Universal Service–supported voice telephone network. Broadband-enabled technology gives Americans with disabilities the opportunity to improve personal communication and leave inaccessible voice telephony behind. For people with disabilities, advanced telecommunications technologies and services are not only something nice to have. They are a critical communications link and equalizer with the rest of the population. Yet for Americans with disabilities to be able to benefit from new technologies, policymakers must (1) ensure the continued vitality of existing relay services, and (2) ensure that disabled Americans, many of whom live in poverty, also have access to broadband-enabled benefits at home.

For Seniors

Policies designed to accelerate the use of broadband could save seniors more than \$800 billion by reducing healthcare costs.⁸ These benefits are as substantial as what the federal government is likely to spend on homeland security over the next 25 years, and under the right set of policies, could exceed what the United States currently spends annually for healthcare for all its citizens. A New Millennium Research Council analysis finds that accelerated broadband deployment could lower medical costs, lower costs of institutionalized living, and generate additional output by more seniors and individuals with disabilities in the labor force.

For the Environment

If every U.S. home had Internet access and viewed and paid bills online, the switch would cut solid waste by 1.45 billion tons a year and curb greenhouse-gas emissions by 1.9 million tons a year by less processing and hauling, according to Javelin Strategy & Research.

For Homeland Security

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 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 communication protocol—enhanced network capabilities eliminate many single points of failure, and enable the network to automatically and efficiently work around failures.

The Internet's inherent network efficiencies were on display on September 11, prompting the National Academies of Science to find afterward that the Internet held up better than other communications technologies on that fateful day.⁹ Among the thousands of casualties on 9/11 was our outdated communications infrastructure. According to the National Academies, on 9/11, 95 percent 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 percent of Internet addresses remained off-line for an extended period. 9/11 demonstrated the Internet's overall resilience to attacks through its flexibility and adaptability. But 5 years after 9/11, America has not done enough to advance the broadband Internet technologies that can help avoid future communications failures.

For Public Safety

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 failed, preventing 9-1-1 calls from being answered. Public safety leaders say this could have been avoided if they had switched to IP-based voice and

data communication.¹⁰ Connecting public safety answering points to broadband, like we've connected schools and libraries, is the new post-Katrina communications imperative.

For Government

Universal broadband could 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, D.C. offices could be inaccessible but employees would still need to communicate. Federal workers using broadband-enabled phones could immediately begin working 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 7 to 10 days in a severe flu pandemic, according to a new survey.¹¹ Broadband is an essential ingredient in allowing people to stay connected to work and to work from home.

For Telecommuters

Broadband access is essential for enabling more Americans to occasionally work from home—delivering dramatic benefits:

- If everyone who could took full advantage of telecommuting, the reduction in miles driven would save \$3.9 billion

a year in fuel and the time savings would be equal to 470,000 jobs¹²— simultaneously reducing our dependence on foreign oil, traffic congestion, and greenhouse gas emissions.

- 79 percent of all office workers agree that allowing employees to work remotely improves their work-life balance.¹³
- People who normally commute 30 minutes each way to work can reduce their commute by 125 hours annually over a 50-week year—the equivalent to giving them more than three weeks of additional vacation time every year.

The benefits for the disabled, for homeland security, for keeping jobs in the United States, for telecommuting, for reducing greenhouse gas emissions and our dependence on foreign oil, for public safety, for business productivity, and for the economy could be greater than almost any transition throughout American history or being contemplated by Congress today.

For All Americans

In a nation as culturally, ethnically, and racially rich and diverse as the United States, there is an imperative to ensure that the broadband benefits described here are available to all. To this end, the Benton Foundation envisions an inclusive digital society in which all members, especially the underserved, have access to the latest technology and the training necessary to make the best use of it, at home, in school and in the workplace.

Broadband, and policies that ensure equitable access to it, can help make this vision a reality.

THE RATIONALE FOR MODERNIZING UNIVERSAL SERVICE

Universal Service is the time-honored federal program that subsidizes telephone service for rural, remote, and poor Americans. The nearly 70-year commitment Congress and this nation have had to Universal Service has been indispensable in providing the same opportunities for rural and low-income Americans to participate in the nation's economy. Universal Service programs delivered essential communications services to rural areas, the poor, schools, libraries, and clinics. It made the telephone a ubiquitous communications tool in the United States and enhanced the value of the public network to all users. This unparalleled level of communication fostered economic productivity and increased our quality of life immeasurably. The vital importance of this program is clear to anyone who has ever lived in rural America or struggled to make ends meet. A rural electrification in the 1930s led to a surge of economic growth and raised living standards across rural America, Universal Service can play the same role in the Internet era.

However, for all its past success, support for the Universal Service Fund (USF) today is at a crossroads. The program faces a challenge at present because of a declining base of long distance minutes which funds the program and a growing number of companies and services that the fund supports.

1. The amount needed to be paid out from the USF is growing. The USF itself has grown every year since 1996 and is likely to continue to increase—quadrupling in recent years from \$1.8 billion in 1996 to \$7.2 billion in 2007.¹⁴
2. The number of recipients has grown 20-fold in only four years. The growth in the number of competitive eligible telecommunications carriers (CETCs) and the support they receive have strained the program. In 2003, fewer than 30 designated CETCs received approximately \$126.7 million in high-cost support.¹⁵ Four years later, approximately 650 designated CETCs are projected to receive more than \$1.2 billion in support.¹⁶ What once represented a small proportion of the high-cost fund now represents almost one quarter of that program.
3. The revenue base is shrinking. The “base” of interstate and international revenues (long-distance calls) that supports the fund has been stagnant or declining. The base fell from \$81 billion in 2000 to \$73 billion in 2005.

4. The contribution factor has doubled since 2000. As a result of these macro trends, the contribution factor (the portion of a long distance bill that pays for the program) has more than doubled, from an annualized rate of 5.7 percent in 2000 to 11.3 percent in the third quarter of 2007.¹⁷

These accelerating trends, which show no sign of abating, demand immediate universal service reform. And in reforming the universal service program, policy-makers have both a challenge and an opportunity—to make broadband an explicit part of the Universal Service Fund. As communications technologies change, Universal Service must change with it, thus ensuring it remains the bedrock of America's communication future. Some say we can't afford to make this change. However, it is becoming increasingly clear that we can't afford not to. Indeed, making the transition to broadband can, over the long run, save consumers tremendously.

Yet broadband deployment in the United States has stagnated, and those at the bottom of the economic scale who could benefit most are being left behind. The stakes of this policy issue couldn't be higher. According to the Department of Commerce, 95 percent of newly-created jobs will demand computer skills. Making broadband access universal may be the single best thing we can do to extend the American dream to more Americans and make America the preeminent economy—and democracy—of the 21st century.

Congress did not envision that services supported by Universal Service would remain static. Instead, it views universal service as an evolving level of communications services.”

—Kevin Martin

FCC Chair

Many believe that the reason America lags behind other industrialized nations in broadband adoption is America's low population density as compared to other industrialized nations. However, contrary to conventional policy wisdom, our low population density does not account for our failures in broadband. Factors explaining the difference include: (1) higher prices for broadband service offered in the United States and 2) a substantial low-income population that cannot afford it.¹⁸ In countries such as Japan, consumers can get broadband service with connection speeds as high as 100 megabits per second (mbs) for under \$40 per month, even as United States consumers pay comparable amounts for 1- or 2-megabit links that are 50 times slower.¹⁹

Broadband costs can be lowered and speed increased through a variety of pragmatic policy choices. Prices can be lowered by spurring greater broadband competition, spurring new wireless broadband technologies, enabling new broadband services that can cut costs and create demand,²⁰ allowing municipalities to offer broadband choices, supporting innovative broadband applications (such as voice and video) that can drive broadband, all in conjunction with a modernized broadband universal service program that targets support and a comprehensive national broad-

band strategy. As Congressman Edward Markey (D-MA) has pointed out, "For the United States any successful plan that will move us up in these rankings will inevitably involve a mix of policy solutions including competitive policies, universal service, targeted grants, wireless policy, network neutrality provisions, municipal offering of broadband service—and maybe other tools as well."

Past experience rolling out telephone networks suggests that the extra investment the USF program provides is a necessary complement to other policies to reach all Americans at affordable rates. While broadband penetration is indeed increasing, Internet penetration overall (which includes both broadband and dialup) appears to be hitting the top of an S-curve in the United States. The Pew Foundation for Internet and Life found that 32 percent of the adult population doesn't use the Internet—a figure that may be plateauing.²¹ If more of how we communicate, work, live, and learn moves online, those without access because of affordability could cost America even more because of our inability to include all Americans in our digital future. The current analog-based universal service funding system is inadequate to bridge this gap or to meet future needs as technology evolves and broadband-based communication becomes the norm.

ADVANCING A STRATEGY FOR THE FUTURE

Advancing a goal of universal broadband access must begin with the creation of a vision and strategy for achieving it. However, as FCC commissioner Michael Copps points out, the United States is perhaps the only industrialized nation without a coherent national strategy for broadband. President Bush has laid out an ambitious goal of universal broadband access by 2007, but without a coordinated and comprehensive bipartisan broadband strategy, it's clear he won't even come close to achieving the goal. We must think anew, create a strategy, and update our policies appropriately. We can't get to a George Jetson goal with policies rooted in the Fred Flinstone era.

Krishna Jayakar and Harmeet Sawhney, in their paper, examine several successful national broadband strategies developed by countries that have overtaken the United States in per capita broadband deployment. They find that many embrace ubiquitous broadband for the competitive advantages it offers (not only a societal goal), and embrace universal goals that extend beyond mere physical connectivity to fostering the "arenas of innovation" that drive broadband adoption and drive demand for it. Policies that focus on enabling broadband innovation (applications, services, and devices) that make broadband more valuable and drive its uptake are also key components in these effective national strategies (i.e., promoting digital literacy and providing incentives for broadband service innovation).

In the United States there several proposed broadband goals based on speed.

- The President has called for affordable universal broadband access by 2007.
- The new Democratic Congress has outlined an innovation agenda that calls for every American to have affordable access to broadband within five years.
- The Communications Workers of America (CWA) recommends the United States adopt policies for universal access and set deployment timetables: 10 mbps downstream, and 1 mbps upstream by 2010, with new benchmarks set for succeeding years.
- Technet has called for a goal of an affordable 100 mbs broadband connection to 100 million homes and small businesses by 2010 and a national strategy to achieve this goal.
- The Fiber to the Home Council has called for a "100 Megabit Nation" policy aimed at extending affordable next-generation broadband connections to a major-

I think we're probably the only industrialized country on the face of the earth that lacks a coherent national strategy to build this infrastructure, and it's damaging for all Americans. It's damaging for small businesses who are unable to compete, and most of all, it's damaging for minorities and diversity communities, people who live in the inner cities and people who live in rural America, where the market, I don't think, is just going to automatically take all of this infrastructure.

—*Michael Copps*
FCC Commissioner

ity of Americans by 2010, with universal availability by 2015—and a national strategy for achieving it.

- In January 2007, Vermont Governor Jim Douglas proposed a plan to ensure all Vermonters at least 3 megabits per second of symmetric bandwidth by 2010 and at least 20 megabits per second symmetrically by 2013.
- Senator John Rockefeller (D-WV) has introduced S. Res. 191 to establish a national goal of deploying, by 2015, universal and affordable access to next-generation networks with a capacity of at least 100 mbps in both directions, and calling for Congress and the President to develop a strategy, enact legislation, and develop policies to achieve this objective.

While the President and Democratic leaders have outlined "affordable access" goals—meaning that consumers must merely have the choice of being able to purchase broadband, CWA and Technet offer more specific

“deployment” goals which may presume actual consumers connected. But as yet, few have looked beyond mere “access” goals to the longer term goal of true universal broadband deployment—something that most experts recognize as an inevitable progression and essential for America’s continued digital leadership. But policies for achieving it have not yet been developed. If Americans have universal affordable broadband access in five years (they have a choice to purchase it), on what timeframe, at what speeds, and at what price are they necessary to enable a complete switchover to digital communications?

As we have done with digital television, our goal must include not only a transition to newer and better digital services, but it must also include a plan for moving away from older and limited analog services. Merely extending universal service support to broadband, without a commensurate decrease in analog support, could increase costs to consumers who can’t afford to pay more. Instead, broadband support should be phased in over a limited timetable, while phasing out support for analog service. In fact, continued subsidization of outdated analog technologies may create disincentives for the digital transition we seek to accelerate.

We can learn from companies and countries that are making the switch. British Telecom, the incumbent phone company for the United Kingdom, for example, hopes to complete work on its “21st Century Network” by 2009. It will replace its outdated analog phone network with a single Internet protocol network to handle all of a customer’s needs: voice, data, email, movies, etc. On completion of this user-centric network, all phone calls will travel across the network as VoIP calls, though customers will be unaffected, still being able to use their household telephones.

Increasingly, voice, video, and data will flow to homes and businesses over broadband platforms. In this new world, as voice becomes just one application over broadband networks, we must ensure that universal service evolves to promote advanced services.

—Jonathan Adelstein
FCC Commissioner

Being able to handle voice calls more inexpensively, as just another stream of data such as email or streaming video, is one of the benefits of transitioning to broadband networks. Replacing its analog telephone service with broadband and VoIP allows BT to lower its operating costs and save an estimated \$1.9 billion per year as a result of the network overhaul.²²

In the Netherlands, the country often at or near the top of international broadband rankings, the incumbent phone company, KPN, plans to unplug its analog phone network by 2010—relying entirely on broadband and VoIP to serve its customers.²³ This will allow KPN to reduce its costs, while offering consumers more capable digital services.

While U.S. policymakers have sought to accelerate the overall digital migration by setting a specific date for switching off analog cellular service and for switching off analog TV services, there is no such plan for switching off the outdated and antiquated analog phone network, let alone a plan for migrating from analog to digital networks.

A complete transition to digital networks is not only essential for our economy and our consumers, it’s essential for the future financial success of rural telephone companies, as well. Per-minute voice costs are quickly plunging to zero. As *the Economist* magazine points out, “Metered telephone calls whose cost depends on the length of the call and the distance covered are becoming an anachronism.”²⁴ To remain in business these rural companies, often a provider of last resort, need new revenue streams. Rural phone companies won’t be successful unless they are able move to broadband and tap into a broader stream of broadband-enabled services.

According to figures from Informa, a market research firm, global revenues from fixed-line voice calls were around \$600 billion in 2005, and data revenues were \$202 billion. By 2010, Informa predicts, fixed-line calls will account for less than half of operators’ revenues in the developed world. Instead, their new core product will be broadband Internet access. Even as voice revenue declines, fixed-line operators have a booming new business in the form of broadband Internet access, for which global revenues will grow from \$202 billion in 2005 to \$410 billion by 2011, Informa predicts. The broadband boost will help offset any decline in voice revenue. Some rural operators understand that being able to provide telephone and television over the same broadband connection is the key to their continued economic vitality and to increasing their overall revenues. Policymakers shouldn’t protect rural providers from this opportunity, but accelerate it.

It is increasingly apparent to providers that IP communication provides a better form of network interconnection. IP can cost less; enable voice, video, and multimedia; provide high-value services such as presence and instant messaging; and enable higher-quality wideband speech. For digital phone services, it can enable features not possible in today's outdated analog phone network. Nearly 90 percent of broadband-enabled phone service early adopter households claim the same or better voice quality and service reliability than traditional landline service.²⁵

This broadband migration can enable incredible secondary consumer benefits. One study, for example, found that broadband-enabled VoIP competition will not only allow consumers to do more than today's analog network, but will save consumers an astounding \$100 billion over the next five years.²⁶ It means greater cost savings to consumers than the President's much-touted tax cuts—reducing telephone costs three times more than the entire Universal Service Fund will over the same period. But these telephone benefits are limited when Americans lack broadband access and the phone competition it can enable.

Many Americans who have watched a competitive cell phone market add feature after amazing feature in a few short years have reason to wonder why the features available on their landline phones have remained essentially the same for the last 30 years. Today's analog phone network has become antiquated and outdated. For example, two thirds of the frequencies in which the human ear is most sensitive, and 80 percent of the frequencies in which speech occurs, are beyond the capabilities of the public telephone network. Now some broadband-enabled phone services around the world are offering services known as High Definition (HD) or wideband voice service. These enhanced services often enable CD-quality sound, surround sound for conference calls, and even telepresence for better communication. These HD voice services can be especially important for people with disabilities. Likewise, broadband phone services can enable new mobility and features not possible in yesterday's analog network.

A national strategy and policies that encourage investment in a next-generation broadband infrastructure, applications and services that can support both voice and data are essential if the United States is to maintain its global leadership.

POLICIES THAT WORK

Amit Schejter's paper looks at how Europeans may be on the way to taking a more innovative and effective approach to Universal Service by considering the adoption of a universal broadband goal. Europeans have quickly moved ahead of the United States on broadband. They have embraced, perfected, and benefited from the open competitive network concepts first developed by U.S. policymakers but later abandoned in the United States. The combination of competition between broadband providers and a Universal Service broadband goal have proven effective in Europe.

Some may ask whether the United States can take a 20th century solution and apply it to a 21st century problem. The paper by Heather E. Hudson explains how the Telecommunications Act of 1996 took an important first step in linking Universal Service and broadband access. The act created the E-Rate program as part of the Universal Service Fund to make broadband universally available in every school, classroom, and library in America. The E-Rate, not without its detractors, has been an enormous success in improving broadband access for libraries and schools. In 1996, only 28 percent of public library systems offered public Internet access. Today, thanks to increased resources and the E-Rate, nearly all library buildings offer public access computing, and 14 million Americans regularly use these computers at no fee. Further, only 3 percent of instructional classrooms were wired in 1994. As of 2003, 93 percent of instructional classrooms were wired. Between 1998 (when the E-Rate was launched) and 2003, statistics show that classroom Internet access disparities between rural, urban, and suburban schools and high and low-poverty districts were dramatically reduced. A former FCC chair calls the E-Rate the biggest new investment in education since the creation of the GI Bill of Rights.

The paper by Nancy Kranich finds that, thanks to the USF's E-Rate program and other investments, 99 percent of public libraries are now wired—many with broadband and wireless services—and offer free public access to the Internet. Libraries are now the number-one point of access for the public outside the home, school, and work, leveling the playing field for those left behind in the Digital Age. But the success of the E-Rate program goes well beyond Internet access—it now is helping provide a communication outlet of last resort in a crisis. Both 9/11 and Katrina

demonstrated the power of public access broadband in libraries for providing alternative communication channels. Continuing the success of the E-Rate and expanding the goals of Universal Service to broadband could similarly have broad and unmistakable impacts, well beyond simply increasing Internet access rates.

BRIDGING GEOGRAPHY

Once connected to broadband, we are no longer limited by the borders on a map or the geography of where we live. The only limits we face in this broadband world are the limits of our imaginations. In a digital world, borders can begin to function more as bridges than barriers, and geography can be spanned. However, as Sharon Stover points out in her paper, rural America is far behind in its broadband access compared to urban areas—yet stands to benefit most by bridging geography. She finds rural connectivity is vital to cultivating economic vitality in rural areas.

But the FCC's rural broadband data, reliant on zip codes that span vast areas in rural America, provide a poor tool for gauging the pervasiveness of broadband subscriber-ship in rural America. In July 2006, FCC data showed that 99 percent of zip codes have at least one high-speed service

provider. But if one person in a zip code has access to broadband, the FCC counts everyone in the zip code as having broadband. It's like counting everyone in a zip code as driving a Lexus if only one person does. This abysmal data provide a weak platform which policymakers must plan the nation's future.

The Government Accountability Office (GAO) took a close look at the efficacy of the FCC's broadband data. In Kentucky, for example, the GAO relied on extensive state-level data to conclude that 77 percent of residents had broadband access as of mid-2005. However, FCC zip code data from the end of 2004 showed 96 percent of Kentucky households had broadband access. Instead of declaring mission accomplished, America needs better intelligence on broadband availability, take-up, speeds, and prices.

A preponderance of evidence shows that rural Americans are indeed being left behind, as are rural small businesses. Broadband in these rural and remote regions offers extraordinary benefits. Stover finds that broadband can empower people through improved access to health care, better education, and access to more jobs—lifting rural economies and connecting their success to the rest of the country.

MOVING FROM (A)NALOG TO (B)ROADBAND

EVERYTHING OVER IP—A CHANGING COMMUNICATIONS ENVIRONMENT

Broadband opens up a new frontier in communications. As the paper by Richard D. Taylor points out, soon voice, video, and everything else will be delivered over IP networks. Former FCC commissioner Kathleen Abernathy characterized it as a move toward “Everything Over IP” (EOIP). In the world of EOIP, it all becomes delivering packets of bits—a commodity service. In the EOIP world, “voice” capability is integrated into many applications, and will not manifest merely as VoIP. It will be part of messaging (IM), games, “push to talk,” and likely will be a basic feature of next generation-operating systems. It will be available in many ways at no separate charge. It may be ad-supported, or free, or bundled. In the EOIP world, there is no need for a separate voice network. Charging consumers based on criteria such as time of call, time of day, distance of call, local vs. long-distance, and length of conversation will no longer make sense as communication enters the global Internet world, a world that is no longer usage sensitive, no longer distinguishes between local and long distance or between voice and data.

With a more competitive USF model, prices to customers would more realistically reflect the cost of providing service; competitors would compete to provide the service to the consumer and win the support, as well. This would ensure a reasonable parallelism between those who are required to contribute and those who can apply for distributions from the USF. USF has generally supported infrastructure. Thus, contributions from broadband connection providers make parallel sense. The physical infrastructure is the piece that often costs more over greater distances and the piece to which we need to connect people. However, if other broadband-enabled services are important enough to be required to pay in, then those types of services are also important enough that rural and low-income Americans should benefit by accessing them through Universal Service support.

CURRENT USF POLICIES ACTUALLY STAND IN THE WAY OF UNIVERSAL BROADBAND

When Universal Service was created, chips were things that you ate, windows were things you washed, disks were things you slipped, blackberries were things you picked, a cable referred to a telegram, the net was for fishermen, and the web could only be traversed by spiders. Today the

future is digital, and USF has not kept pace with changing technology.

Broadband access is not a supported service under the universal service program, even though there is some indirect benefit. The USF’s High-Cost Program does promote broadband indirectly through investments that rural carriers make to upgrade their telephone networks. The

Currently federal and state regulation causes consumers and taxpayers to pay staggering sums to sustain old networks when much less money could pay for the same services plus additional services and also for the cost of building Big Broadband to every home and business . . . [T]he invention of VoIP—voice over a high speed Internet access connection—actually means that state and federal regulations that subsidize and guarantee affordable local telephone service should be junked. Instead, if state and federal authorities want to assure that everyone can buy voice service, they should write rules to subsidize Big Broadband connections, through which voice can be provided at a fraction of the cost of maintaining today’s legacy networks.

—*Reed Hundt*
former FCC Chair

upgraded networks are generally capable of offering both conventional telephone service and new broadband service. The National Exchange Carrier Association (NECA) reports that about 920, or three quarters of its member telephone companies, the vast majority of which operate in rural areas, offer residential digital subscriber line (DSL) service for \$30 per month. Some of those investments become part of the historical costs that rural carriers use in filing for funding from the High-Cost Program. Ironically, a rural provider would lose Universal Service support if he/she transitioned from conventional phone service and upgraded to broadband in order to provide consumers with high-speed data, more cost-efficient voice over IP, and enabled digital television.

Rather than an immediate flash cut in the current USF system's analog support, a five- to seven-year timetable for transitioning subsidies from analog to digital—with a hard analog shut-off date—will put the United States on a more sure-footed broadband trajectory.

However, incumbent local exchange companies are in many cases burdened with equipment that is outdated and inefficient relative to what could be used if they were starting fresh. Universal Service funding to keep consumer prices below costs provides an incentive to use outdated equipment, rather than investing in more efficient technologies. More efficient competitors would likely prevail (at least on price) were the market cost-based. Using Universal Service to level the playing field between incumbents and competitors actually may have the perverse effect of discouraging both competition and innovation. Innovations are unlikely to attract investment if they must compete with established and subsidized status quo technology. The same factors that hold incumbent carriers back from upgrading their systems also deter would-be competitors. Most competitive attention is focused on urban and suburban markets, where the economies of scale are better and where there is guaranteed demand for advanced services.

Rob Frieden's chapter examines the flaws, defects, and accommodations that exist in the current Universal Service funding process with an eye toward proposing a new, workable system that can support broadband infrastructure development. Frieden argues that consumers deserve more from their sizeable investment in the universal uervice program. Because of its blanket approach, USF provides financial benefits to some consumers who are able to pay the full cost of their telecommunication services while at the same time imposing contribution obligations on consumers, including the working poor and others not well equipped to absorb

the financial burden. He points out that the emphasis on promoting basic telephone penetration has a negative effect on broadband penetration. The current USF system creates several constituencies keen on maintaining the status quo, regardless of its efficacy and efficiency, and potentially thwarting broadband goals.

The USF system largely accepts as a given whatever costs carriers report, regardless of whether carriers could operate more efficiently, and whether newer technologies might offer lower costs, possibly without significant recurring operational costs. To sustain future USF funding in a changing telecom environment, a connection-based contribution mechanism would be more equitable and sustainable over the long run. While the expansion of USF to include broadband could create financial challenges in the near term, it could create a more efficient and versatile USF mechanism in the long run. Frieden argues for several alternative means to transition from a usage-based mechanism to a non-usage-based mechanism, including greater reliance on competitive grants, project-specific funding, and reverse auctions.

Merely expanding the current Universal Service Fund to support both broadband and telephone without reducing the costs of the program in other ways could increase its costs, as well as increase costs for many, including the working poor. An escalation of the size of the fund threatens the affordability that the program was intended to safeguard. Instead, analog support should be phased out over time and replaced with broadband support—creating extra incentives for the broadband switch.

It's high time to revisit universal service policy in the broadband age . . . Universal voice service has been accomplished. We won. We don't need voice subsidies anymore. Why subsidize voice overbuilds when so many rural areas lack broadband access? Universal broadband service is what the fund should be supporting now.

—*Richard Notebaert*
Qwest CEO

In addition, every effort should be made to ensure that the USF contribution base is broad, the distribution mechanism is narrow, and the number of companies that can compete to serve customers at the lowest cost is maximized. This way, the fund can support access over excess.

Nearly 80 percent of ILEC lines are already broadband-capable. Therefore any high-cost broadband subsidy should go toward upgrading the remaining lines first. But subsidizing a single technology or single class of companies is antithetical to the nature of convergence. Cable companies currently reach 95–97 percent of U.S. households, and 93 percent of these lines are cable-modem ready. Shouldn't cable companies, who may be able to provide broadband and a digital phone offering more affordably than the incumbent provider, be able to compete for Universal Service support—especially if they are also paying into the fund? The FCC is now looking at proposals for reverse auctions, where the cable and telephone companies can compete with each other to offer the service. These types of reverse auctions have worked successfully to get the biggest bang for the buck in the USF's E-rate program. However if the FCC goes down this road, care must be taken in crafting such an approach because cable and incumbent telephone company footprints are often not the same.

Any extension of USF to broadband should toss aside the old regulatory emphasis on local exchange carriers, and the USF should be distributed in a technology-neutral manner. The Universal Service overhaul passed by the Senate Commerce Committee in 2006, for example, would no longer limit the assistance to eligible telecommunications carriers, but rather require the FCC to set up a competitive selection process.

SHIFTING CONTROL FROM PROVIDER TO USER

The paper by Jorge Schement outlines how universal broadband can put consumers in the driver's seat and enable new choices. For many years, universal telephone service meant ubiquitous black phones. But broadband is different. It moves decisions that were once made in the core of the network to the edge of the network. Once a consumer has broadband, he/she can eventually choose the voice, video and other services of his/her choice—not from the network owner but from a competitive broadband marketplace. Control can shift from providers to users. Communication no longer has to be a scarce centrally controlled resource; it can be pervasive and abundant. But too often today's consumers lack choices. Universal Service should be about enabling universal choice. But it's not only choices in service, it enables choices in life. Schement shows that broadband is about political participation, economic participation, and social participation. Broadband enables more user-created content so that people can actively shape content for themselves.

The Universal Service system has been instrumental in keeping Americans connected and improving their quality of life. However, this system is in dire need of comprehensive reform.

—*Robert M. McDowell*
FCC Commissioner

ADVANCING A UNIVERSAL BROADBAND GOAL

Many argue that the FCC already has the authority to advance broadband as a part of Universal Service. The Telecommunications Act of 1996 requires that the basket of services included in the definition of Universal Service—and thus eligible for USF support—be reviewed and updated periodically. Specifically, Section 254(c) of the act says us that “Universal Service is an evolving level of telecommunications services” and the FCC is tasked with “periodically” reevaluating this definition “taking into account advances in telecommunications and information technologies and services.” Under the law, that process begins with the Federal-State Joint Board on Universal Service, comprising of regulators from the FCC and the states, and is given specific authority to recommend “from time to time” to the FCC modification in the definition of the services to be included for federal Universal Service support. The Joint Board then recommends changes to the FCC, which can accept, reject, or modify them. Many believe this section of the law already requires the FCC to promote broadband everywhere.

In November of 2007, the FCC’s Federal State Joint Board, in a historic move, found for the first time that section 254 of the Telecommunications Act requires the FCC to include broadband as a supported service under the Universal Service Fund and that it is in the public interest to do so. It also recommended the FCC act comprehensively to reform the Universal Service mechanism by creating a specific broadband fund under the program. This is a critical first step, but unless the FCC acts immediately on the Joint Board’s recommendation to adopt and deploy broadband under USF, many Americans, especially those in rural and remote regions, may inadvertently be left without broadband choices for years. This would put the United States further behind our international competitors. More specifically, the Joint Board’s recommendation would create a new broadband deployment fund within USF but only with up to \$300 million per year to provide broadband service to unserved areas. While this is a critical step forward, the size of the Joint Board’s recommendation is nonetheless woefully inadequate for tackling the challenge at hand.

If the broadband deployment cost is estimated at \$1000 per line (a potentially low estimate), a \$300 million per year fund would add a maximum of 300,000 more broadband connections—increasing the nation’s penetra-

KEY USF QUESTIONS FOR POLICYMAKERS

1. Should broadband infrastructure and services be explicitly funded?
2. What is the optimal size of the fund and does it need to be capped?
3. Should it fund competition in high-cost markets?
4. How many networks should be funded in high-cost markets?
5. On what cost basis should carriers be reimbursed?
6. How many access lines per customer, or household, should be funded?
7. Is USF support intended for networks or for individuals?
8. Should contributions be pegged to network usage, use of numbers, connections, or some other methodology?
9. Should Universal Service continue to be a shared federal–state responsibility, or is there some other configuration that makes sense?

—Tony Clark
NARUC Commissioner

tion level by only about 1 percent. The National Exchange Carrier Association (NECA), an association of local telephone companies, estimates the challenge as much bigger than the \$300 million the Joint Board proposes. NECA’s Packet Train study estimates the additional investment cost of upgrading 5.9 million rural telephone access lines to 8 mbps, a level capable of delivering voice, video, and data to rural customers, is \$11.9 billion. Adding operating expenses, overhead expenses, and depreciation expenses, plus a return on investment, translates into a \$3 billion annual revenue requirement, as estimated by NECA. However, NECA may underestimate the offsetting increase in revenue rural companies would gain from increasing expanding revenues streams from only voice to a triple play of voice, video, and data services—or the reduction in costs by moving to more efficient, newer technologies. NECA only assumes recovery of \$99 per month in triple-play revenue to cover costs of \$121.91 per month. Instead, industry analysts report that users on average are paying \$148 per month for triple-play bundled services.²⁸ This revenue is likely to increase to \$206 per month per subscriber by 2010, by adding incremental value-added services, such as TV-based caller ID and home monitoring, to basic triple-play service bundles.²⁹ In these cases, triple-play income is

We need to make broadband the dial tone of the 21st century

—*Jonathan Adelstein*

FCC Commissioner

likely to more than offset the cost of broadband upgrades. But as NECA points out, the problem may be more acute in unserved areas, where costs are 1.4 times higher. These are the areas where Universal Service support will be critical.

Anecdotally, some rural phone companies that have made the switch to a single broadband network have been able to more than triple their revenue and decrease their costs at the same time. Coleman County Telephone Cooperative (CCTC) in rural Texas was able to deliver a profitable triple-play of next-generation services—voice, video, and data—by deploying a single IP-based network.³⁰ CCTC increased revenues from about \$20 a month for analog phone service to about \$100 a month for a package of VoIP, video, and data; decreased its operational costs; and empowered consumers by putting them in charge of new digital phone and television features not possible on yesterday's telephone network. Likewise, Cross Telephone in rural Oklahoma faced declining subscriber revenue. But it embraced broadband and a triple-play of voice, video, and data over a converged IP network.³¹ This end-to-end IP solution enabled Cross Telephone to deliver new, advanced services, increasing the average subscriber rate from \$45 per month for local telephony (excluding toll calls) to approximately \$105 per month to include VoIP, digital TV, and high-speed Internet access.

Recovering the extra \$3 billion a year through Universal Service, the amount NECA estimates broadband upgrades will cost, would increase contributions by an estimated 50 cents to a dollar per month for USF contributors. But simultaneously reducing analog telephone phone support, while increasing broadband support, combined with other policy measures, could substantially reduce or even eliminate the need for increasing USF support payments as well as facilitate the build-out of the nation's broadband communications networks. Additionally, if allowed, cable

and other providers may be able to cut the costs of providing both broadband and voice to subscribers as an alternative to rural phone companies.

But universal service doesn't only advance communications in rural America, it also provides a communications safety net for low-income households. Care must be taken that in the Information Age we do not become a nation of digital haves and have-nots. We are already on that trajectory, with millions of Americans lacking even basic phone service and millions more lacking basic access to the Internet. It suggests we need to better understand and improve USF's Lifeline program for the Digital Age. Justin Brown's paper focuses on USF's Lifeline program. Today only about one third of low-income households in the United States that qualify participate in Lifeline, a universal service program that provides monthly financial assistance toward wireline telephone service. One of the biggest challenges is consumer awareness—pointing to the need for robust and targeted consumer outreach to build awareness and highlight best practices. Brown found that 70 percent of respondents in his survey favored maintaining the current Lifeline discount and 56.6 percent of respondents are interested in expanding the discount to Internet access. It would make sense since, in 2005, approximately 1 in 10 households (11.4 percent) with incomes below \$30,000 reported having broadband access. Brown reports, "The notion of extending Universal Service initiatives like Lifeline is particularly compelling when broadband providers offer local phone service through voice-over-Internet protocol (VoIP) as a bundle with high-speed Internet access."

There's no "one-size-fits-all Broadband solution," but for one thing, the country needs a Universal Service Fund that has broadband as its core mission.

—*Michael Copps*

FCC Commissioner

KEY POLICY ENABLERS FOR ACHIEVING UBIQUITOUS BROADBAND

Our nation's commitment to ubiquitous and affordable communications has never been more important than now. Making broadband as ubiquitous as telephone service must be the goal of Universal Service in the 21st century. This principle is simple, powerful, and fundamentally important to our nation's future competitiveness and to consumers' future opportunities. Standing at the threshold of an information technology revolution, we cannot and should not abandon or weaken our guarantee of universal, affordable communication access for all Americans. Instead we must unleash the rivers of data and opportunity that broadband can enable, and extend the bounty from another turn in the river to a new generation of Americans.

POLICY ENABLERS

1. To restore the country's Internet competitiveness, create a comprehensive national digital strategy. Specifically, create a new White House Office for Digital Strategy to oversee the development of a national digital strategy, to become an advocate for broadband-enabled innovation and benefits, to foster investment in the broadband applications that can unleash broadband's full potential, and to ensure that every sector of the economy and every group of Americans can benefit. This new office should oversee a new Digital Innovation Task Force (built on the Information Infrastructure Task Force model) to ensure that every federal agency—whether focused on health, veterans, education, commerce, labor, homeland security, or law enforcement—is a part of the nation's digital migration. The task force should create an "Agenda for Action" with specific goals and initiatives addressing critical national needs and communities.
 - a. To ensure a comprehensive broadband strategy that maximizes technological opportunities, the national strategy should utilize a comprehensive set of broadband policies that will:
 - Create avenues for broadband access by opening up more spectrum for wireless broadband, allowing community-based broadband options, and enacting a broadband tax credit for companies that deploy broadband in rural and underserved parts of America.

- Ensure the continued growth of Internet-based services that create the demand for broadband by providing a stable regulatory framework to attract investment by existing providers and new entrants.
 - Enable broadband demand drivers like social networking, VoIP, IP video, and user-created content.
 - Continually focus on the research and development necessary, as well as the science and math expertise required, for America to maintain its role in the world as an innovation leader.
- b. To ensure America's broadband policy keeps up with technological change, the FCC should immediately update the definition of broadband, currently defined as 200 kilobits per second downstream, to at least 2 mbs. Then, update the definition of broadband on a regular basis. Create a national broadband strategy with benchmarks and deployment timetables; i.e., a minimum of 2mbs to all households and at least 10mbs to 100 million households by 2010. In developing the strategy, policy makers should take into account the evolving speeds necessary for different levels of capability—i.e., the speeds for enabling digital phone competition, digital video competition, telecommuting, telepresence, tele-immersion, HD video, and the many other services that will become essential in the future. A coordinated and comprehensive bipartisan national broadband strategy must be developed that moves us from analog to digital networks and from mere goals of "access" to more strategic initiatives around broadband deployment, application innovation, and strategies for maximizing its use in every sector of the economy.
 - c. In order to better assess progress against the national plan, collect broadband data on a more granular basis. A national strategy must begin with better broadband data from the FCC.

To restore the country's
Internet competitiveness, create
a comprehensive digital strategy.

To reduce greenhouse gas emissions and reduce our dependence on foreign oil, develop a specific broadband-enabled national telecommuting strategy . . .

2. Harness digital opportunities to address grand challenges. Create a Broadband Innovation Fund utilizing auction proceeds realized from making more spectrum available for broadband, as well as the federal government's own savings from transitioning to digital IP-based voice communications, estimated at \$3 to \$10 billion a year,³² to accelerate efforts to invest in digital solutions to address the grand policy challenges of today. Bring together agency expertise through a DARPA-type research and development effort for the Digital Age to address high-risk, but high-payoff digital initiatives. Leverage the federal government's patchwork of digital initiatives by bringing them together into a cross-cutting broadband innovation council (similar to the Information Infrastructure Task Force), including input from the White House Office of Science and Technology Policy, the National Economic Council, the Council of Economic Advisors, Department of Education's Enhancing Education Through Technology (EETT) initiative, the Department of Health and Human Services' Health Information Technology Initiative, The Department of Commerce's National Telecommunications and Information Administration (NTIA), the National Institute of Standards and Technology and the Patent and Trademark Office, the Department of Energy's national laboratories, the Department of Justice's National Institute for Justice and anti-trust division, the U.S. Department of Agriculture's Rural Broadband Loan program, the Department of Housing and Urban Development's Empowerment Zone and Housing programs, the Veterans Affairs Department's disability access initiative, the General Services Administration's government wide telecommuting initiative, the National Science Foundation (NSF) Digital Library, DoIT, and Cybercorps Initiatives, the Department of Transportation's (DOT) Next Generation 911 and

intelligent highways initiatives, the National Institute of Museum and Library Sciences digitization initiative, the Office of Management and Budget's e-government initiative, the Department of Homeland Security's business and government continuity initiatives, the Federal Trade Commission's privacy initiatives, the Department of Labor e-training initiative, and others appropriate other entities.

- a. To avoid another communication failure in a post-9-11, post-Katrina world, accelerate the transition to IP-enabled broadband networks to provide more redundant and more capable communications. Six years after 9/11, America has not done enough to advance the broadband Internet technologies that can help avoid future communications failures. Explicitly expand Universal Service support to Public Safety Answering Points, (PSAPs) just as the E-Rate expanded support to schools and libraries. Accelerate transition to IP-enabled 911 emergency network as being advanced by DOT, NENA, IETF, and Congressional E911 caucus leaders. Build on current flu pandemic and homeland security efforts to ensure Americans have a plan and an ability to work remotely in the case of a major event.
- b. To reduce greenhouse gas emissions and reduce our dependence on foreign oil, develop a specific broadband-enabled national telecommuting strategy beginning by moving from 19 percent to 100 percent of federal employees that are eligible to telecommute by 2012.³³
- c. To connect people with disabilities to the Digital Age, reform the Universal Service funding mechanism for relay services, along with the USF contribution funding mechanism, to put it on a more sustainable economic foundation. Enable Americans with disabilities, often on the outskirts of financial stability, to qualify for Lifeline support for their communication technologies. Invest in the development of new broadband-enabled disability technology.
- d. To ensure children and communities can connect, continue to ensure a vital and relevant E-Rate program in support of schools and libraries. Minimize the paperwork burden on schools and libraries where appropriate. Allow E-Rate recipients to create wireless broadband canopies that can also provide public broadband access in communities. Restore funding for educational technology initiatives, including the \$500 million EETT which the administration has proposed to eliminate.

Restore funding for educational technology initiatives . . .

- e. To ensure America stays on the cutting edge, reinstate the Technology Opportunities Program at NTIA.
- 3. Extend broadband's reach to those who can benefit most, modernize the federal Universal Service program. As the FCC's Universal Service Joint Board has recommended, the FCC should swiftly act to explicitly expand universal service to broadband and set a level of service and a target price comparable to dominant technology in urban areas. Allow other classes of data and voice providers who pay into Universal Service to be able to compete for USF support and provide service more competitively, efficiently, and affordably.
 - a. To ensure that the cost of a broadband transition does not substantially increase the costs of the USF program, begin a five-year transition timetable for transforming Universal Service from a completely analog support system to a completely digital support system, with appropriate incentives for upgrading equipment in "high-cost" areas to more efficient "lower-cost" technologies. A converged broadband platform that carries both voice and data is more efficient, more robust, and not substantially more expensive than PSTN upgrades. As the PSTN equipment depreciates and requires replacement, it should be replaced with an IP platform, the FCC needs to act swiftly to grapple with how to phase out support for analog networks while phasing in support for digital broadband and digital phone services.
 - b. To ensure the fund's continued vitality, broaden the base of USF contributions, equitably assessed and technology-neutral, to stabilize the financial future of the fund by adopting a contribution methodology based on working telephone numbers, connections, or a combination thereof. Lifeline users and users of free services should be exempted, as they already contribute to affordable communications.
 - c. To ensure the continued integrity of the fund, tighten the reigns of oversight and control that ensure disclosure of how the fund's distributions are spent, who qualifies to spend them, and what the results of that spending yield. Increased data collection to make these assessments, including determining the capacity of lines in service areas, will be a key component to understanding how and where to make strategic investments in infrastructure. The USF program must be permanently exempted from the Anti-Deficiency Act. Discipline the size of the fund through rigorous oversight, realistic maximum allocations, forward-looking cost assessments, more granular targeting of support to specific census tracts, and sliding scales of eligibility and reimbursement.
 - d. To ensure that the underserved populations who qualify for targeted support are able to take advantage of the program, increase Lifeline/Linkup education and awareness by allowing USF money to be used for greater outreach and public education associated with the program and best practices.
 - e. To make the transition from analog to digital communications, a focus on bridging yesterday's outdated and inadequate analog voice network with tomorrow's digital network is essential. It takes policies that can lower the barriers in communicating between broadband and the PSTN—rather than policies that erect new barriers between them. It requires an intercarrier compensation regime that recognizes the future will be geographically neutral and no longer time- or distance-sensitive. And it requires a commitment to allowing innovation and consumer choice to drive future communication technologies.

ENDNOTES

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- ⁶ The Pew Institute and American Life Project survey found that 11 percent of Internet users, or about 14 million Americans, have at one time made a phone call over the Internet. www.pewinternet.org/PPF/r/129/report_display.asp
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- ²² Total cost of the overhaul is estimated at \$10 billion, www.infoworld.com/article/06/11/28/HNbtallipnetwork_1.html?source=rss&url=http://www.infoworld.com/article/06/11/28/HNbtallipnetwork_1.html
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²⁹ See www.itfacts.biz/index.php?id=P6579

³⁰ It yielded numerous cost, feature, and “single network” serviceability benefits to the cooperative and its rural subscribers. By upgrading to an IP network and VoIP, CCTC can offer its rural subscribers services such as Web-based call feature configuration; call forwarding based on calling number, time, or day; distinctive ringing based on calling number; and inbound and outbound call logs—features unachievable in the traditional PSTN. By allowing remote configuration and reducing truck rolls, CCTC was able to quickly decrease its operational costs while increasing

billable service revenues. For example, instead of getting only about \$20 a month for voice service, CCTC’s average monthly subscriber rate is predicted to reach \$57 for digital voice, \$92 for voice and data, over \$100 when all three services—voice, video, and data—are rolled out.

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APPENDIX 1: UNIVERSAL SERVICE FOR AN OPEN 21ST CENTURY DEMOCRACY

We believe deeply that the openness of 21st century democracy in America depends on universal access to a public broadband network. Without it, American society will fragment into a tiered society where a few enjoy the kind of voice and discourse envisioned by the Founders, but where others speak in whispers and many others will be mute. In other words, communication creates society, and open communication creates open society. Consequently, the project pursues twin aims.

INFLUENCING PUBLIC POLICY

The project will produce a set of essays laying the policy foundation for a historic shift to universal service defined by broadband deployment. The audience for these essays includes Congress, the administration, the FCC, state regulators, corporate executives, and telecommunications opinion leaders. Essays embrace the framing and messages likely to appeal to this audience.

We believe deeply that the openness of 21st century democracy in America depends on universal access to a public broadband network.

INFLUENCING PUBLIC DISCOURSE

The project intends to use the essays as a springboard for initiating a broader reframing of public discourse by pursuing venues to disseminate the following principles for a progressive information society.

- Universal Service, ubiquitous high-speed broadband access for all Americans, is a right derived from Americans' inalienable rights to life (economic opportunity), liberty (participatory democracy), and the pursuit of happiness (the realization of one's personal potential).
- Universal Service must offer everyone a reasonable opportunity to participate fully.
- Every American should have the opportunity to communicate with every other American, across a range of media, with transparent boundaries, within a reasonable timetable.
- An open democracy requires accessibility to information if citizens are to participate fully in the discourses of the day; but, more importantly, if citizens are to lead.
- To create an Information Commons, we must promote organizations of information that emphasize open and free access, self-governance, collaboration, interactivity, free or low cost, and sustainability.

APPENDIX 2: PAPER ABSTRACTS

Regaining the Lead: Universal Service for a Globally Competitive America by **Jorge Schement** outlines how universal broadband can put consumers in the driver's seat and enable new choices. For many years, universal telephone service meant ubiquitous black phones. But broadband is different. It moves decisions that were once made in the core of the network to the edge of the network. Once consumers have broadband, they can eventually choose the voice, video, and other services they want—not from the network owner but from a competitive, broadband marketplace. Control can shift from providers to users. Communication no longer has to be a scarce, centrally controlled resource; it can be pervasive and abundant. But too often today's consumers lack choices. Universal Service should be about enabling universal choice. But it's not only choices in service, it enables choices in life. Schement shows that broadband is about political participation, economic participation, and social participation. As broadband enables more user-created content, people can actively shape the content of Universal Service for themselves. Schement's paper is available online at www.benton.org/index.php?q=node/6059.

Krishna Jayakar and **Harmeet Sawhney**, in *Universal Access in the Information Economy: Tracking Policy Innovations Abroad*, examine several successful national broadband strategies developed by countries that have overtaken the United States in per capita broadband deployment. They find that many embrace “ubiquitous” broadband for the competitive advantages it offers (not only a societal goal), and embrace universal goals that extend beyond physical connectivity to fostering the “arenas of innovation” that drive broadband adoption and drive demand for it. Many policies, which focus on enabling broadband innovation (applications, services, and devices) that make broadband more valuable and drive its uptake, are also key components in these effective national strategies; i.e., promoting digital literacy and providing incentives for broadband service innovation. Jayakar and Harmeet Sawhney's paper is available online at www.benton.org/index.php?q=node/5598.

Time for Change: Transforming Funding for Broadband Universal Service by **Richard D. Taylor** points out, that soon voice, video, and everything else will be delivered over IP networks. Former FCC commissioner Abernathy characterized it as a move towards “Everything Over IP” (EOIP). In the world of EOIP, it all becomes just delivering packets of bits—a commodity service. In the EOIP world, “voice” capability is integrated into many applications, and is not manifest merely as VoIP. It is part of messaging (IM), games, “push to talk,” and likely is a basic feature of next-generation operating systems. It will be available in many ways at no separate charge. It may be ad supported or free or bundled. In the EOIP world, there is no need for a separate voice network. Charging consumers based on criteria such as time of call, time of day, distance of call, local vs. long-distance, and length of conversation will no longer make sense, as communication enters the global Internet that is neither usage sensitive nor does it distinguish between local and long distance or between voice and data. Taylor's paper is available online at www.benton.org/index.php?q=node/6062.

Rob Frieden's *Strategies for Repairing the Universal Service Fund* examines the flaws, defects, and accommodations that exist in the current Universal Service funding process with an eye to proposing a workable system that can support broadband infrastructure development. Frieden argues that consumers deserve more from their sizeable investment in the Universal Service program. Because of its blanket approach, USF provides financial benefits to some consumers who are able to pay the full cost of their telecommunication services, while at the same time imposing contribution obligations on consumers, including the working poor and others ill equipped to absorb the financial burden. He points out that the emphasis on promoting basic telephone penetration has a negative effect on broadband penetration. The current USF system creates several constituencies keen on maintaining the status quo, regardless of its efficacy and efficiency and potentially thwarting broadband goals. Frieden's paper is available online at www.benton.org/index.php?q=node/6060.

The Future of Universal Service Fund Support for Organizations: Schools, Libraries and Rural Health Care Providers by **Heather E. Hudson** explains how the Telecommunications Act of 1996 took an important first step in linking Universal Service and broadband access. The act created the E-Rate program as part of the USF to make broadband universally available in every school, classroom, and library in America. The E-Rate, not without its detractors, has been an enormous success in improving broadband access for libraries and schools. In 1996, only 28 percent of public library systems offered public Internet access. Today, thanks to increased resources and the E-Rate, nearly all library buildings offer public access computing, and 14 million Americans regularly use these computers at no fee. In 1994 only 3 percent of instructional classrooms were wired. As of 2003, 93 percent of instructional classrooms were wired. Between 1998 (when the E-Rate was launched) and 2003, statistics show that classroom Internet access disparities between rural, urban, and suburban schools and high- and low-poverty districts have been dramatically reduced. A former FCC chair calls the E-Rate the biggest new investment in education since the creation of the GI Bill of Rights. Hudson's paper is available online at www.benton.org/index.php?q=node/4948.

Libraries as Universal Service Providers by **Nancy Kranich** finds that, thanks to the USF's E-Rate program and other investments, 99 percent of public libraries are now wired—many with broadband and wireless services—and offer free public access to the Internet. Libraries are now the number-one point of access for the public outside the home, school, and work, leveling the playing field for those left behind in the digital age. But the success of the E-rate program goes well beyond Internet access—it now provides a communication outlet of last resort in a crisis. Both 9/11 and Katrina demonstrated the power of public access broadband in libraries for providing alternative communication channels. Continuing the success of the E-Rate and expanding the goals of Universal Service to broadband could similarly have broad and unmistakable impacts well beyond increasing Internet access rates. Kraniche's paper is available online at www.benton.org/index.php?q=node/4949.

Sharon Strover points out in *Universal Service and Rural America* that rural America is far behind in its broadband access compared to urban areas—yet stands to benefit most by bridging geography. She finds rural connectivity is vital to cultivating economic vitality in rural areas. But the FCC's rural broadband data, reliant on zip codes that span vast areas in rural America, provide a poor tool for gauging the pervasiveness of broadband subscribership in rural America. Rural Americans are, indeed, being left behind, as are rural small businesses. Broadband in these rural and remote regions offers extraordinary benefits. Strover finds that broadband can empower people through improved access to health care, better education, and access to more jobs—lifting rural economies and connecting their success to the rest of the country. Strover's paper is available online at www.benton.org/index.php?q=node/6061.

Amit Schejter's "*From all my teachers I have grown wise, and from my students more than anyone else.*" *What Lessons Can the U.S. Learn from Broadband Policies in Europe?* looks at how Europeans may be on the way to taking a more innovative and effective approach to Universal Service, by considering the adoption of a universal broadband goal. Europeans have quickly moved ahead of the United States on broadband. They have embraced, perfected, and benefited from the open, competitive network concepts first developed by U.S. policymakers but later abandoned in the United States. The combination of competition between broadband providers and a Universal Service broadband goal have proven effective in Europe. Schejter's paper is available online at www.benton.org/index.php?q=node/5597.

Where is the Link in the Lifeline? by **Justin Brown** looks at the critical issue of awareness about the Lifeline program among low-income people in Florida. His research indicates that only one of every three people eligible actually participates in this program that subsidizes phone service for low-income households. Brown's paper is available online at www.benton.org/node/7958.