

# INTRODUCTION

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## CHAPTER 1



## IN EVERY ERA, AMERICA MUST CONFRONT THE CHALLENGE OF CONNECTING OUR NATION ANEW.

In the 1860s, we connected Americans to a transcontinental railroad that brought cattle from Cheyenne to the stockyards of Chicago. In the 1930s, we connected Americans to an electric grid that improved agriculture and brought industry to the Smoky Mountains of Tennessee and the Great Plains of Nebraska. In the 1950s, we connected Americans to an interstate highway system that fueled jobs on the line in Detroit and in the warehouse in L.A.

Infrastructure networks unite us as a country, bringing together parents and children, buyers and sellers, and citizens and government in ways once unimaginable. Ubiquitous access to infrastructure networks has continually driven American innovation, progress, prosperity and global leadership.

Communications infrastructure plays an integral role in this American story. In the 1920s, '30s, '40s and '50s, telephony, radio and television transformed America, unleashing new opportunities for American innovators to create products and industries, new ways for citizens to engage their elected officials and a new foundation for job growth and international competitiveness.

Private investment was pivotal in building most of these networks, but government actions also played an important role. Treasury bonds and land grants underwrote the railroad,<sup>1</sup> the Rural Electrification Act brought electricity to farms and the federal government funded 90% of the cost of the interstate highways.<sup>2</sup>

In communications, the government stimulated the construction of radio and television facilities across the country by offering huge tracts of the public's airwaves free of charge. It did the same with telephony through a Universal Service Fund, fulfilling the vision of the Communications Act of 1934 "to make available, so far as possible, to all the people of the United States, a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges."<sup>3</sup>

Today, high-speed Internet is transforming the landscape of America more rapidly and more pervasively than earlier infrastructure networks. Like railroads and highways, broadband accelerates the velocity of commerce, reducing the costs of distance. Like electricity, it creates a platform for America's creativity to lead in developing better ways to solve old problems. Like telephony and broadcasting, it expands our ability to communicate, inform and entertain.

Broadband is *the* great infrastructure challenge of the early 21st century.

But as with electricity and telephony, ubiquitous connections are means, not ends. It is what those connections enable that matters. Broadband is a platform to create today's

high-performance America—an America of universal opportunity and unceasing innovation, an America that can continue to lead the global economy, an America with world-leading, broadband-enabled health care, education, energy, job training, civic engagement, government performance and public safety.

Due in large part to private investment and market-driven innovation, broadband in America has improved considerably in the last decade. More Americans are online at faster speeds than ever before. Yet there are still critical problems that slow the progress of availability, adoption and utilization of broadband.

Recognizing this, one year ago Congress echoed the Communications Act of 1934 and directed the FCC to develop a National Broadband Plan ensuring that every American has "access to broadband capability." Specifically, the statute dictates:

*"The national broadband plan required by this section shall seek to ensure that all people of the United States have access to broadband capability and shall establish benchmarks for meeting that goal. The plan shall also include:*

- *an analysis of the most effective and efficient mechanisms for ensuring broadband access by all people of the United States,*
- *a detailed strategy for achieving affordability of such service and maximum utilization of broadband infrastructure and service by the public,*
- *an evaluation of the status of deployment of broadband service, including progress of projects supported by the grants made pursuant to this section, and*
- *a plan for use of broadband infrastructure and services in advancing consumer welfare, civic participation, public safety and homeland security, community development, health care delivery, energy independence and efficiency, education, worker training, private sector investment, entrepreneurial activity, job creation and economic growth, and other national purposes."<sup>4</sup>*

This is a broad mandate. It calls for broadband networks that reach higher and farther, filling the troubling gaps we face in the deployment of broadband networks, in the adoption of broadband by people and businesses and in the use of broadband to further our national priorities.

Nearly 100 million Americans do not have broadband today.<sup>5</sup> Fourteen million Americans do not have access to broadband infrastructure that can support today's and tomorrow's applications.<sup>6</sup> More than 10 million school-age children<sup>7</sup> do not have home access to this primary research tool used by most students for homework.<sup>8</sup> Jobs increasingly require Internet skills; the share of Americans using high-speed Internet at work grew by 50% between 2003 and 2007,<sup>9</sup> and the number of jobs in information and communications technology is growing 50%

faster than in other sectors.<sup>10</sup> Yet millions of Americans lack the skills necessary to use the Internet.<sup>11</sup>

What's more, there are significant gaps in the utilization of broadband for other national priorities. In nearly every metric used to measure the adoption of health information technology (IT), the United States ranks in the bottom half among comparable countries,<sup>12</sup> yet electronic health records could alone save more than \$500 billion over 15 years.<sup>13</sup> Much of the electric grid is not connected to broadband, even though a Smart Grid could prevent 360 million metric tons of carbon emissions per year by 2030, equivalent to taking 65 million of today's cars off the road.<sup>14</sup> Online courses can dramatically reduce the time required to learn a subject while greatly increasing course completion rates,<sup>15</sup> yet only 16% of public community colleges—which have seen a surge in enrollment<sup>16</sup>—have high-speed connections comparable to our research universities.<sup>17</sup> Nearly a decade after 9/11, our first responders still require access to better communications.

Unless we reform our approach to these gaps, we will fail to seize the opportunity to improve our nation, and we will fall behind those countries that do. In fact, other countries already have adopted plans to address these gaps.

The ways that other countries have confronted this challenge help inform how we might approach the problem. But each country's experiences and challenges have critical differences. Our solutions must reflect the unique economic, institutional and demographic conditions of our country.

The United States is distinct in many ways. For example, many countries have a single, dominant nationwide fixed telecommunications provider; the United States has numerous providers. Cable companies play a more prominent role in our broadband system than in other countries. The U.S. is less densely populated than other countries. Unlike most other countries, we regulate at both the state and federal levels. Our plan should learn from international experiences, but must also take into account the distinguishing realities of broadband in the United States.

Our plan must be candid about where current government policies hinder innovation and investment in broadband. Government or influences critical inputs needed to build broadband networks—such as spectrum, universal service funds and rights-of-way—yet all are structured to serve the priorities of the past, not the opportunities of the future. In addition, current government policies maintain incentives for our schools, hospitals and other public interest institutions to use outdated technologies and practices, disadvantaging our people and hindering our economy. Just as this plan should build on the distinctive attributes of the American market, it should also correct the problematic policies found here.

Above all, an American plan should build on American strengths.

The first of these strengths is innovation. The United States maintains the greatest tradition of innovation and entrepreneurship in the world—one that combines creativity with engineering to produce world-leading applications, devices and content, as well as the businesses that bring them to market.

Our national plan must build on this strength to ensure that the next great companies, technologies and applications are developed in the United States. U.S. leadership in these spheres will advance our most important public purposes. A healthy environment for innovation will enable advances in health care, energy, education, job training, public safety and all of our national priorities. Creativity is a national virtue that has catalyzed American leadership in many sectors. America's plan should unlock that creativity to transform the public sector, too.

We have just begun to benefit from the ways broadband unleashes innovations to improve American lives: a job seeker in South Bend telecommuting for a company in the Deep South; a medical specialist in Chapel Hill providing medical consultations to a patient in the Hill Country; grandparents in Cleveland video-chatting with their grandchildren in Colorado Springs; firefighters downloading blueprints of a burning building. The applications that broadband enables provide innovative, efficient solutions to challenges Americans confront every day.

Many international broadband plans emphasize speeds and networks, focusing only on technical capacity as a measure of a successful broadband system. Our plan must go beyond that. While striving for ubiquitous and fast networks, we must also strive to use those networks more efficiently and effectively than any other country. We should lead the world where it counts—in the use of the Internet and in the development of new applications that provide the tools that each person needs to make the most of his or her own life.

The United States is well positioned to lead in creating those applications. We have leading health research centers; we should also lead the world in effective health care applications. We have leading educational institutions; we should also lead the world in effective educational applications. We should seize this opportunity to lead the world in applications that serve public purposes.

The second great American strength is inclusion. As a country, we believe that to march ahead we don't need to leave anyone behind. We believe that all deserve the opportunity to improve their lives. We believe that where you start shouldn't dictate where you finish, that demography isn't destiny, that privilege isn't a necessary prologue to success.

This ideal doesn't just compel us to rebuke discrimination; it compels us to be proactive. It inspires us to live up to an

obligation we have to each other—to ensure that everyone has an opportunity to succeed.

This desire for equal opportunity has long guided our efforts to make access to technologies universal, from electricity to telephony, from television to radio. Today, as technology continues to change the way the world interacts, to be on the outside is to live in a separate, analog world, disconnected from the vast opportunities broadband enables.

While broadband adoption has grown steadily, it is still far from universal. It lags considerably among certain demographic groups, including the poor, the elderly, some racial and ethnic minorities, those who live in rural areas and those with disabilities. Many of these Americans already struggle to succeed. Unemployment rates are high, services like job training are difficult to obtain and schools are substandard.

Broadband can help bridge these gaps. Today, millions of students are unprepared for college because they lack access to the best books, the best teachers and the best courses. Broadband-enabled online learning has the power to provide high-quality educational opportunities to these students—opportunities to which their peers at the best public and private schools have long had access. Similarly, with broadband, people with disabilities can live more independently, wherever they choose.<sup>18</sup> They can telecommute and run businesses from their homes or receive rehabilitation therapy in remote and rural areas.

Of course, access to broadband is not enough. People still need to work hard to benefit from these opportunities. But universal broadband, and the skills to use it, can lower barriers of means and distance to help achieve more equal opportunity.

Absent action, the individual and societal costs of digital exclusion will grow. With so many Americans lacking broadband access or the skills to make it matter, the Internet has the potential to exacerbate inequality. If learning online accelerates your education, if working online earns you extra money, if searching for jobs online connects you to more opportunities, then for those offline, the gap only widens. If political dialogue moves to online forums, if the Internet becomes the comprehensive source of real-time news and information, if the easiest way to contact your political representatives is through e-mail or a website, then those offline become increasingly disenfranchised.

Until recently, not having broadband was an inconvenience. Now, broadband is essential to opportunity and citizenship.

While we must build on our strengths in innovation and inclusion, we need to recognize that government cannot predict the future. Many uncertainties will shape the evolution of broadband, including the behavior of private companies and consumers, the economic environment and technological advances.

As a result, the role of government is and should remain limited. We must strike the right balance between the public and private sectors. Done right, government policy can drive, and has driven, progress. In the 1960s and '70s, government research funding supported the development of the technology on which the Internet is based.<sup>19</sup> In the 1990s, the Federal Communications Commission acted to ensure that telephone providers would not stall use of the Internet.<sup>20</sup> An act of Congress stimulated competition that caused cable companies to upgrade their networks and, for the first time, offer broadband to many Americans.<sup>21</sup> Auctions for public spectrum promoted competitive wireless markets, prompting continual upgrades that first delivered mobile phones and, now, mobile broadband.<sup>22</sup>

Instead of choosing a specific path for broadband in America, this plan describes actions government should take to encourage more private innovation and investment. The policies and actions recommended in this plan fall into three categories: fostering innovation and competition in networks, devices and applications; redirecting assets that government controls or influences in order to spur investment and inclusion; and optimizing the use of broadband to help achieve national priorities.

A thoughtful approach to the development of electricity, telephony, radio and television transformed the United States and, in turn, helped us transform the world. Broadband will be just as transformative.

The consequences of our digital transformation may not be uniformly positive. But the choice is not whether the transformation will continue. It will. The choice is whether we, as a nation, will understand this transformation in a way that allows us to make wise decisions about how broadband can serve the public interest, just as certain decisions decades ago helped communications and media platforms serve public interest goals. This plan is the first attempt to provide that understanding—to clarify the choices and to point to paths by which all Americans can benefit.

## CHAPTER 1 ENDNOTES

- 1 See The Pacific Railroad Act of July 1, 1862 § 5, 12 Stat. 489, 492–93, available at <http://memory.loc.gov/cgi-bin/ampage?collId=llsl&fileName=012/llsl012.db&recNum=524>.
- 2 See Federal Highway Administration, Eisenhower Interstate Highway System—Frequently Asked Questions, <http://www.fhwa.dot.gov/interstate/faq.htm#question7> (last visited Feb. 12, 2010).
- 3 Communications Act of 1934, Pub. L. No. 73–416, 48 Stat. 1064 (codified, as amended, at 47 U.S.C. § 151 et seq.).
- 4 American Recovery and Reinvestment Act of 2009, Pub. L. No. 111–5, § 6001(k)(2)(D), 123 Stat. 115, 516 (2009) (Recovery Act).
- 5 See John Horrigan, *Broadband Adoption and Use in America* 13 (OBI Working Paper No. 1, 2010) (Horrigan, *Broadband Adoption and Use in America*) (finding that only 67% of households have broadband).
- 6 See OMNIBUS BROADBAND INITIATIVE (OBI), THE BROADBAND AVAILABILITY GAP (forthcoming); In general, availability of access infrastructure capable of supporting a given download speed does not guarantee that service providers will offer service at those speeds. Note that these numbers do not take into account quality of service.
- 7 Horrigan, *Broadband Adoption and Use in America* at 33. Since 75% of families have broadband at home, 25% of families do not. According to the U.S. Bureau of the Census, 17.4% of the U.S. population is between the ages of 5 and 17. 17.4% of 305 million (total U.S. population estimate) is 53 million people. 25% of 53 million is approximately 13 million. Population estimates come from U.S. Census Bureau, 2006–2008 American Community Survey 3-Year Estimates—Data Profile Highlights, <http://factfinder.census.gov/servlet/ACSSAFFacts>.
- 8 Natalie Carlson, *National Survey Finds Kids Give High Marks to High Speed*, HISPANIC PRWIRE (Apr. 2007), available at <http://www.hispanicprwire.com/generarnews.php?1=in&id=2774&cha=0>.
- 9 See Pew Research Center, *Pew Internet & American Life Project*, Data Sets, June 2003 and March 2007, <http://pewInternet.org/Data-Tools/Download-Data/Data-Sets.aspx>. (see variable BBW, which is the percentage of people saying they use broadband at work. The calculation compared the number of Americans saying they used broadband at work in 2003 to the number saying they used broadband at work in 2007).
- 10 See BUREAU OF LABOR STAT., OCCUPATIONAL PROJECTIONS AND TRAINING DATA, 2008–2009 EDITION (2008), available at [http://www.bls.gov/emp/optd/optd\\_archive.htm](http://www.bls.gov/emp/optd/optd_archive.htm) (download from link).
- 11 Horrigan, *Broadband Adoption and Use in America* at 5.
- 12 Cathy Schoen et al., *Survey of Primary Care Physicians in Eleven Countries*, 28 HEALTH AFF. W1171 (2009), available at <http://content.healthaffairs.org/cgi/reprint/28/6/w1171?ijkey=46Z9Be2ia7vm6&keytyp e=ref&siteid=healthaff> (requires purchase). Count of 14 functions includes: (1) electronic medical record; (2, 3) electronic prescribing and ordering of tests; (4–6) electronic access to test results, Rx alerts, and clinical notes; (7–10) computerized system for tracking lab tests, guidelines, alerts to provide patients with test results, and preventive/follow-up care reminders; and (11–14) computerized list of patients by diagnosis, by medications, and due for tests or preventive care.
- 13 Richard Hillestad et al., *Can Electronic Medical Record Systems Transform Healthcare? Potential Health Benefits, Savings, and Costs*, 24 HEALTH AFF. 1103, 1103 (Sept./Oct. 2005), available at <http://content.healthaffairs.org/cgi/reprint/24/5/1103>.
- 14 PACIFIC NORTHWEST NAT'L LAB. (PNNL), DOE, SMART GRID: AN ESTIMATION OF THE ENERGY AND CO<sub>2</sub> BENEFITS (2009), available at [http://www.pnl.gov/main/publications/external/technical\\_reports/PNNL-19112.pdf](http://www.pnl.gov/main/publications/external/technical_reports/PNNL-19112.pdf). EMISSION FACTS: GREENHOUSE GAS EMISSIONS FROM A TYPICAL PASSENGER VEHICLE (2005) (providing EPA auto emission facts), available at <http://www.epa.gov/OMS/climate/420f05004.pdf>.
- 15 Marsha Lovett et al., *The Open Learning Initiative: Measuring the Effectiveness of the OLI Statistics Course in Accelerating Student Learning*, J. INTERACT. MEDIA IN EDUC., May 2008, available at <http://jime.open.ac.uk/2008/14/jime-2008-14.pdf>; Joel Smith, Vice Provost and CIO, Carnegie Mellon Univ., Remarks at FCC Education Workshop (Aug. 20, 2009), available at [http://www.broadband.gov/docs/ws\\_education/ws\\_education\\_smith.pdf](http://www.broadband.gov/docs/ws_education/ws_education_smith.pdf).
- 16 RICHARD FRY, PEW RESEARCH CENTER., COLLEGE ENROLLMENT HITS ALL-TIME HIGH, FUELED BY COMMUNITY COLLEGE SURGE (2009), available at <http://pewsocialtrends.org/assets/pdf/college-enrollment.pdf>.
- 17 BRIAN L. HAWKINS & JULIA A. RUDY, EDUCAUSE, FISCAL YEAR 2007 SUMMARY REPORT 35/29, available at <http://net.educause.edu/ir/library/pdf/PUB8005.pdf>.
- 18 Letter from Kathy Martinez, Exec. Director, World Inst. on Disability, to Michael J. Copps, FCC Acting Chairman, and Commission Members, GN Docket No. 09-51 (June 1, 2009) at 1–2.
- 19 See, e.g., Mitch Waldrop, *DARPA and the Internet Revolution*, in DARPA: 50 YEARS OF BRIDGING THE GAP 83 (2008), available at [http://www.darpa.mil/Docs/Internet\\_Development\\_200807180909255.pdf](http://www.darpa.mil/Docs/Internet_Development_200807180909255.pdf).
- 20 See, e.g., *Amendment of Section 64.702 of the Commission's Rules and Regulations (Second Computer Inquiry)*, Final Decision, 77 F.C.C.2d 384 (1980) (regularly separating “basic” from “enhanced” services to prevent owners of telecommunications infrastructure from impeding upon enhanced service growth); *MTS and WATS Market Structure*, Memorandum Opinion and Order, 97 F.C.C.2d 682, paras. 76–83 (1983) (allowing an exemption for access charges for enhanced service providers (ESP)); *Amendments of Part 69 of the Commission's Rules Relating to Enhanced Service Providers*, CC Docket No. 87-215, Order, 3 FCC Red 2631 (1988) (making the ESP access charge exemption permanent).
- 21 Cable Television Consumer Protection and Competition Act of 1992, Pub. L. No. 102-385, 106 Stat. 1460 (1992) (codified at 47 U.S.C. § 533).
- 22 See Omnibus Budget Reconciliation Act of 1993, Pub. L. No. 103-66, Title VI, § 6002(b), 107 Stat. 312 (1993) (amending the Communications Act of 1934 and codified at 47 U.S.C. §§ 153(n), 332(c)(1)).