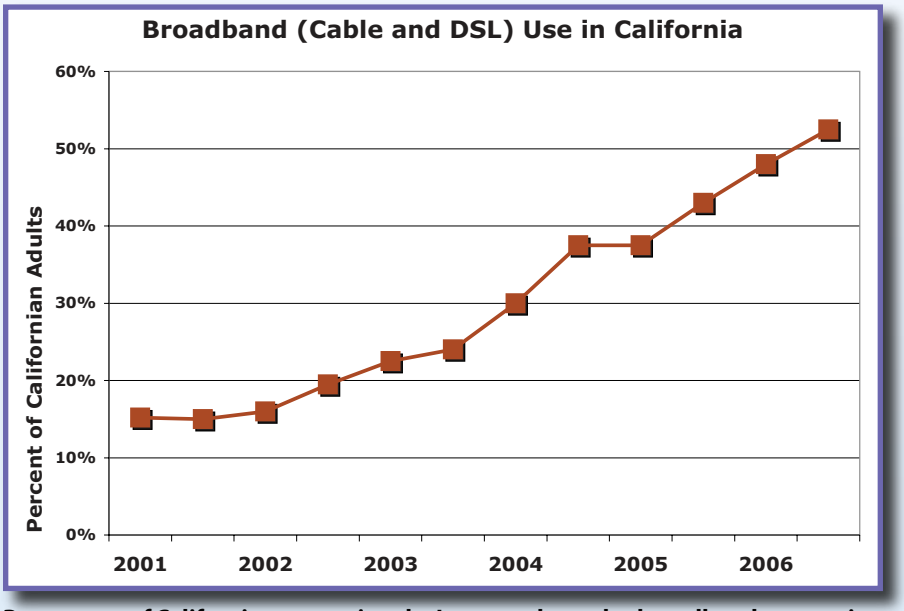
ECONOMIC DEVELOPMENT

Increased Broadband Use Could Add 1.8 Million California Jobs

An increase in California's broadband Internet usage could lead to significantly higher levels of employment and payroll in the state, according to a new study by the Sacramento Regional Research Institute (SRRI). The study finds that broadband use generated approximately 198,000 jobs and approximately $11.6 billion of payroll in California between 2002 and 2005, and concludes that, over the next 10 years, assuming a 3.8 annual percentage point increase in the proportion of the adult population using broadband, California could see a net gain of 1.8 million jobs and $132 billion in payroll.

"There is a clear connection between investing in broadband technology and job growth," says Dr. Kristin Van Gaasbeck, Assistant Professor of Economics at California State University, Sacramento, and one of the authors of the report. SRRI used statistical models, as well as economic and broadband usage data from 2001 through 2005 to analyze 24 major regions of California and project future growth.

According to the study, a boost in broadband use would affect all regions of the state, from major metropolitan areas to more rural communities. For example, in Los Angeles, where travel time is lengthy, broadband access could encourage telecommuting. In San Diego, life sciences and telecommunications companies are reliant on broadband infrastructure and would be positively impacted by increased broadband use. And in entrepreneurial regions like Silicon Valley, broadband allows entrepreneurs to reach beyond their kitchen table or garage and carry on business around the world.



Percentage of Californians accessing the Internet through a broadband connection has more than tripled since 2001

The economic growth model developed by SRRI estimates the historical effects of broadband use at the statewide level and forecasts three scenarios measuring moderate (0.2 percent per year), strong (3.8 percent per year) and dramatic (7.6 percent per year) increases in broadband adoption for the state and its 24 regions. The results cited here are based on the strong growth scenario.

The study was commissioned by AT&T. Detailed charts by region of economic impacts of broadband growth can be found in the summary report at www.srri.net.

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Better Broadband Statistics Needed for Economic Development Strategies

The Pew Internet Project's September 2007 survey found that half of all Americans now have broadband access at home. But even though telephone surveys can measure national broadband adoption and use, many questions require fine-grained data about *local* broadband deployment and use. This kind of detailed and publicly available information can only be collected by government agencies, the Pew Internet Project says – but the Federal Communications Commission has failed to collect it.

Rural communities that want to address their lack of broadband infrastructure don't have the data to tell them where deployment gaps exist. Economic development officials in cities wonder whether higher-quality information infrastructure would improve their pros-

pects for attracting jobs, but their economists struggle to provide reliable advice. Finally, service organizations want to know about the user experience so they can design service delivery programs more effectively.

In June 2006, researchers at the Pew Internet Project, the University of Texas at Austin, and the Massachusetts Institute of Technology convened a workshop including academics, state and federal officials from data-collection agencies, and staff from Capitol Hill. The experts at the workshop, whose proceedings are now available at www.pewinternet.org, recommended collecting data at the smallest geographic levels possible – smaller than areas captured by 5-digit ZIP codes.

Legislation currently working its way through the House and the Senate captures many of the points raised at the workshop. In the Senate, Commerce Committee Chairman Daniel Inouye has introduced the Broadband Data Improvement Act, which calls on the FCC to reevaluate its current definition of broadband (200 Kbps in one direction) and develop a new "second generation broadband" metric. The Inouye bill also requires providers to report broadband availability in 9-digit ZIP code areas, which will enable robust mapping of infrastructure. Inouye's bill also directs the Census Bureau, the Government Accountability Office and the Small Business Administration to gather information about broadband availability and use.

On the House side, the Energy and Commerce Committee approved on October 30 the Broadband Census of America Act, sponsored by Congressman Ed Markey. The House bill directs the Commerce Department to develop an interactive map of broadband infrastructure at the 9-digit ZIP code level. The House bill designates the FCC as the agency to conduct periodic surveys of residential and business broadband users. Like the Senate, the House bill authorizes funding for grants to local planning organizations to facilitate technology planning.

Failure to Achieve Universal Broadband Has "Staggering" Costs

The failure to achieve President Bush's 2004 goal of universal broadband access to the Internet "in every corner of America by the year 2007" has cost the United States hundreds of billions of dollars in added economic development and more than a million high-paying jobs, according to a report by the nonprofit Center for Creative Voices in Media (www.creativevoices.us).

The report finds that wide swaths of America have no broadband at all, or only "fraudband" that is so slow, unreliable, expensive or consumer-unfriendly that it cannot bring Americans the benefits of universal broadband that President Bush cited in 2004, including economic development, high-paying jobs, increased public safety and security, better health care at lower cost, enhanced educational opportunities, and greater citizen participation in government and culture.

"Despite the President's 2004 call for 'Full Speed Ahead' deployment of universal broadband in America by 2007, Washington has moved at 'No Speed Nowhere,'" says Jonathan Rintels, executive director of the Center for Creative Voices in Media. "The economic, social and cultural costs of this failure to deploy broadband to all Americans are staggering."

The report details the overwhelming evidence that fast, affordable and reliable broadband access to the Internet often makes the difference between success and failure, including:

- ***Success***. *Bob Hale, a farmer in rural northeast Oregon, has used his access to high-speed broadband to become the largest red onion supplier to the Subway sandwich chain.*
- ***Failure***. *The Longaberger Company, one of the largest privately held companies in America, built its business selling baskets and crafts produced in its home state of Ohio, where it is a major employer and civic booster. But it was forced to locate its new data center in another state because fast, reliable, and affordable broadband did not exist in the northeast Ohio area where the company is headquartered.*
- ***Success***. *A regional effort to bring fast, reliable, affordable broadband to rural southwest Virginia has spurred the creation of so many high-paying "knowledge-worker" jobs that to avoid a labor shortage, the state has established a "Return to Roots" program to lure back area natives who left before broadband arrived.*
- ***Success***. *In Japan, fast broadband enables pathologists to use high-definition video and remote-controlled microscopes to examine tissue samples from patients living in areas without access to major hospitals.*
- ***Failure***. *Japan has broadband that is eight to thirty times faster than the average speed in America. Here in the U.S., many innovative and cost-saving Internet-based applications are not available because broadband in so many sections of the country is too slow, costly and/or unreliable.*
- ***Success – If We Act Now!*** *Researchers project that deployment of fast, reliable and affordable broadband across America could generate $500 billion a year in added economic development, and expand US employment by an estimated 1.2 million new and permanent jobs.*

The bottom line, the report says, is that in 2007, America is not even close to deploying fast, reliable and affordable broadband to all its citizens. It calls upon the federal government to undertake a concerted national effort to deploy universal, net-neutral broadband comparable to the efforts that deployed telephone and electric service and built a vast network of superhighways, saying that the economic, social and cultural benefits of this investment will vastly outweigh its costs.

10 Million FTTH Subscribers in Japan

Asian markets, apparently unconstrained by the desire to protect legacy networks, are investing strongly in fiber. A new study by BuddeComm (www.budde.com.au) reports that Japan is leading the way in FTTH, jumping from 1.5 million subscribers in mid-2004 to an estimated 10 million by September 2007.

In fact, FTTH subscribers in Japan account for more than 32 percent of the country's total broadband subscriber base. The rapid expansion into fiber saw the number of Digital Subscriber Line (DSL) services peak in early 2006, and the DSL numbers have since moved into decline, as BBP has reported. Japan's initial broadband development was built on the back of huge push into DSL.

The development of FTTH in Asia has been occurring in the more developed markets, but the report find that the adoption rate varies considerably from market to market. In South Korea, for example, the number of FTTH subscribers is relatively small, but there has been strong growth in fiber-to-the-curb and fiber-to-the-node.

Other Asian markets, like Singapore and Taiwan, are busy with pilot FTTH networks and early commercial activity. Taiwan's Chunghwa Telecom has an ambitious plan to cover the island with fiber and was aiming for 2.5 million FTTH subscribers by 2011. Chunghwa has plans to spend $1.83 billion over the next five years for a fiber-to-the-building network that has initially been designed to connect about 25 percent of Taiwan's 7.4 million residences and offices.

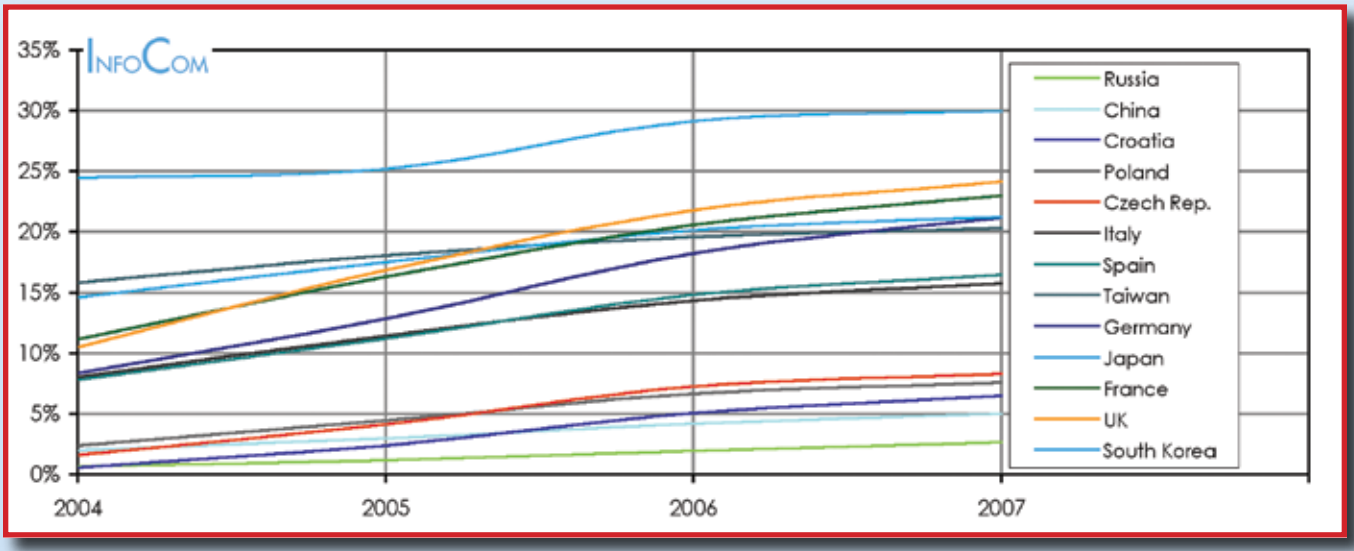
China has also been making positive statements about FTTH rollouts. The development of FTTH was the eleventh priority in China's five-year plan published in 2005. With the 2008 Beijing Olympics fast approaching, China Netcom is making extensive use of fiber as its broadband platform of choice in preparation. In the meantime, China Telecom has announced plans to have FTTH established nationwide by 2010.

Fiber Gains Momentum in Western Europe

Broadband connections in Western Europe reached 85 million at the end of 2Q07, according to market analyst InfoCom (www.infocomde.com), with FTTx gaining momentum as the fastest broadband technology.

In almost all European countries, DSL is the most prevalent wireline broadband technology with a share of over 83 percent, followed by cable modem with about 15 percent and fiber optic with 1.7 percent. Despite its small share of the broadband market, FTTx is showing the strongest growth rate, with 7.7 percent growth during the second quarter.

Fiber optic access is most widespread in Scandinavian countries, especially Sweden (15.1 percent), Denmark (8.4 percent) and Norway (6.5 percent). DSL share has increased slightly in Spain, Italy and the UK, while Germany shows the strongest growth in broadband connections in the quarter (up 5.6 percent). The Netherlands is still the most "broadband" country in Europe, with a penetration of over 34 percent.



Broadband penetration rates in a selection of countries **Source: InfoCom**

ABI Research: FTTH Take Rates Will Rise Dramatically

Fiber-to-the-home take rates will increase over the next several years, topping 56 percent by 2011, says a recent report from ABI Research (www.abiresearch.com).

Demand for high-speed Internet access and broadband services is escalating quickly due to services such as VoD, IPTV, VoIP, and to the integration of mobile and wireline voice services with traditional residential communications services. According to the report, this growth in demand is pushing subscriber levels higher for all categories of broadband access networks, particularly fiber to the home.

The report finds that while GePON is the leading technology today worldwide, GPON will gain a decisive lead in a few years due to deployments by RBOCs and other Tier 1 telecom operators, and Active Ethernet, as the choice of smaller operators, will also gain ground. BPON shipments will decline, but BPON will remain viable for longer in emerging markets such as Latin America, where bandwidth demands are lower.

Nemertes: Internet Demand Could Outpace Capacity by 2010, Stifling Innovation

Consumer and corporate Internet usage could outstrip network capacity both in North America and worldwide in a little more than two years, according to a study by Nemertes Research (www.nemertes.com). The study indicates that Internet access infrastructure, specifically in North America, will cease to be adequate for supporting demand within the next three to five years.

The financial investment required to bridge the gap between demand and capacity ranges from $42 billion to $55 billion in the US, most of it for broadband access capacity, not including the $72 billion that service providers are already planning to invest. Required investment globally is estimated at $137 billion, again primarily in broadband access.

The study was funded by Nemertes' client base including the Internet Innovation Alliance, which purchased distribution rights to the research findings. "The Nemertes study is evidence the exaflood is coming," says Larry Irving, co-chairman of the Internet Innovation Alliance.

Voice and bandwidth-intensive applications such as streaming and interactive video, peer-to-peer file transfer and music downloads and file sharing are redefining the Internet. To analyze the demand and capacity factors, Nemertes Research created a detailed model of Internet infrastructure capacity and user demand based on academic research data; user demand data from surveys; vendor and service provider financials; and interviews with vendors, service providers, IT executives and others. Unlike previous studies, this one measured how demand might grow if capacity were not an issue, and compared that demand to planned capacity growth.

The findings indicate that by 2010, users could increasingly encounter Internet "brownouts" or interruptions to the applications they've become accustomed to using. For example, it may take more than one attempt to confirm an online purchase or it may take longer to download the latest video from YouTube. Overall, the impact of this inadequate infrastructure will be primarily to slow down the pace of innovation. The next Amazon, Google or YouTube might not arise – not from a lack of user demand, but because of insufficient infrastructure preventing applications and companies from emerging.