The **Broadband** Fact Book

Internet Innovation Alliance

To The Reader:

If you are over a certain age, you may regard the Internet as a technological marvel you don't fully comprehend. If you are under a certain age, the Internet has always existed and you may take it for granted. But no matter which side of this divide you are on, there is a very good chance that the Internet plays a significant role in your daily life. And, you almost certainly agree that maintaining a robust, expanding Internet that delivers more and better services to more people should be one of our national priorities.

Indeed, the goal of universal broadband in America unites community activists, elected officials, business executives, labor leaders and average citizens. Belief in universal broadband is bipartisan, persistent and urgent.

The urgency is warranted. Broadband – high speed Internet access – is the transformative technology of our generation. Access to and effective usage of broadband connections enhances individuals', industries' and nation's ability to grow, compete, and succeed. Broadband helps businesses become more productive, governments become more accessible, students become better prepared and citizens become more engaged. It is an opportunity platform that is transforming how we work, live, play and learn.

inside front cover
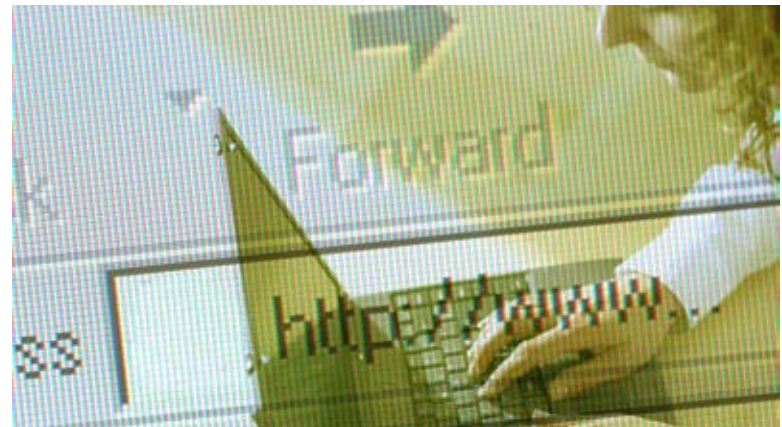
Even as we seek to spread Broadband, we face a companion reality – an exaflood of digital data as the Internet evolves from a text-based medium of e-mail and information searches to a video medium that promises great benefits, but also is creating enormous bandwidth demands barely imagined just a few years ago.

Consider: The Library of Congress in Washington, D.C. holds more than 29 million books and magazines, 2.7 million recordings, 12 million photographs, 4.8 million maps and 57 million manuscripts. That collection took two centuries to assemble. Today we churn out an equivalent amount of digital information every 15 minutes – or about 100 times each day.

The data on digitally-delivered video is even more impressive. YouTube consumes as much bandwidth today as the entire Internet consumed in the year 2000, with users uploading 65,000 more videos every day while downloading 100 million daily – a 1,000 percent increase from a year ago.

This explosion of digital information and applications is a cause for excitement, not concern. It augurs great things for our economy and our quality of life, provided we get the policy environment right.

In this new world, spreading broadband is just part of the job. We also must make sure that our networks are big enough, fast enough and smart enough to handle the coming exaflood.

So how do we do it?

At a minimum, we know that policy makers should ground their considerations in the facts. In our experience, **informed policy makers make the right decisions when they have the most accurate and current information at their fingertips.** Towards that end, the Internet Innovation Alliance has attempted to gather the relevant data in one single location.

We hope this information helps advance the thinking and discussions needed to get the policy environment right. And we welcome your thoughts, feedback and recommendations for additions or changes. Send suggestions to info@internetinnovation.org. This data will be constantly updated and improved on our website, **www.internetinnovation.org.**

Larry Irving & Bruce Mehlman
Co-Chairman
Internet Innovation Alliance

Table of Contents

I. EXECUTIVE SUMMARY

The information in this Broadband Fact Book is more than a collection of data or random facts. While each individual entry may be interesting on its own, the real power of this book flows from the collective story it tells about U.S. efforts to deliver high-speed Internet access to its people, the potential benefits of broadband, and what it will take to achieve our national goals.

The data shows that Americans are signing up for broadband at a rapid rate, but that we remain well short of our national goal of universal deployment.

According to the Pew Internet & American Life Project, the percentage of Americans with a home broadband connection stood at 42% in March 2006, compared to 30% a year earlier. The Federal Communications Commission reports that the number of high-speed lines in the U.S. rose to 64.6 million as of June 30, 2006, up from 42.4 million a year earlier. The FCC said 50.3 million of these lines primarily served residential users.

But Americans are not sharing equally in the spread of broadband. At the end of 2005, only about 24% of rural Americans were enjoying broadband service, compared to 39% in the rest of America. A Pew survey showed that about 58% of African-Americans are now using the Internet, compared to 72% of whites and 69% of English-speaking Hispanics.

The Growth in Broadband Connections Bodes Well for U.S. Economy

On page 33 of this book, we see that the economy grows faster, jobs are more plentiful, and pay is higher in areas where broadband is easily accessible. All told, economists project that universal broadband deployment could add 1.2 million jobs and $500 billion to the U.S. economy. Another study says effective use of broadband could cut $800 billion from health care costs for senior citizens over the next 25 years.

Telecommuting made possible by broadband also delivers measurable benefits. About 45 million Americans took advantage of the Internet to work from home at least some of the time in 2006, saving energy and reducing pollution by cutting back on drives to work. It's estimated that telecommuting can save Americans about $3.9 billion a year on gasoline.

The U.S. Continues to Trail Internationally

The data in this book shows that the U.S. is still well short of its national broadband goals. We continue to run behind many other countries – large and small – in broadband deployment and the speed of broadband services. The U.S. is ranked 15th in the world in broadband penetration, according to the International Telecommunications Union, and also runs behind in speed. Consumers in Japan and South Korea can download movies in less than 30 minutes, compared to about 6 hours on a typical U.S. cable or DSL connection.

Internet Traffic is Exploding as Video Applications Take Hold

Beginning on page 27, the factbook details growth in bandwidth demand because of such data-intensive applications as streaming video, HDTV downloads, and the popularity of peer-to-peer applications. YouTube alone now consumes as much bandwidth in a year as the entire Internet used in 2000 and it's estimated that Video streams will reach 163 million a year by 2011 compared to 1.67 million in 2005.

The explosion of video applications promises to generate an enormous amount of economic activity. Nearly a quarter of American households say they would download movies if the cost was $10 or less per film. It's estimated that video on demand will generate $12.6 billion annually by 2010, while video and music downloads combined are projected to make up a $27 billion market by 2008.

This book tells a story of opportunity as well as challenge. Broadband has the power to change lives for the better – providing we make the right policy choices. This book provides the facts to consider as the U.S. aims to meet the policy challenge of making broadband available to every one of our citizens.

II. INTERNET BASICS AND ACCESS SPEEDS

Definition of the Internet

The Internet is a series of private connected networks and works because of private investment. Competition and innovation make the Internet what it is. The current system has kept the Internet robust by encouraging the use of new technology to increase network efficiency and the offering of new services.


The Internet – A Series of Private Connected Networks.
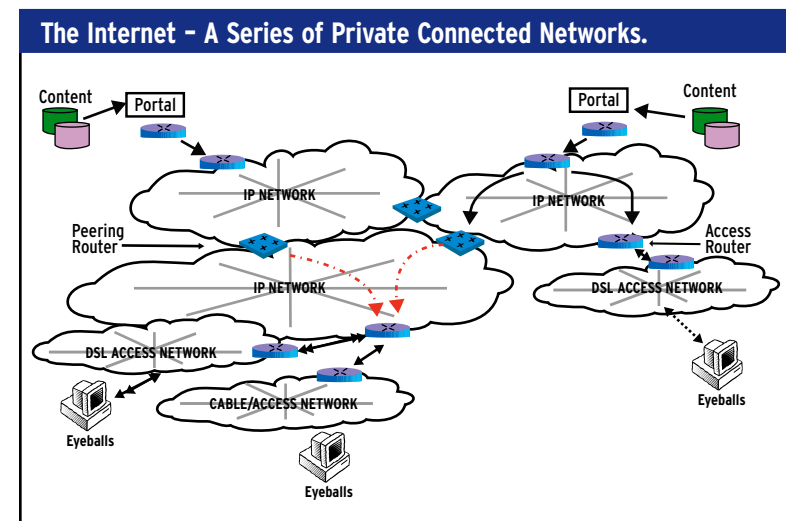
What is the Internet?
The Internet is a series of privately owned networks.

What is this ball of colors? It is the North American Internet, or more specifically a map of just about every router on the North American backbone, (there are 134,855 of them for those who are counting). The colors represent router registration: Red is Verizon; blue AT&T; yellow Qwest; green is major backbone players like Level 3 and Sprint Nextel; black is the entire cable industry put together; and gray is everyone else, from small telecommunications companies to large international players who only have a small presence in the U.S.

Legend
- Verizon group
- AT&T group
- Qwest group
- Cable companies
- Other backbones
- other
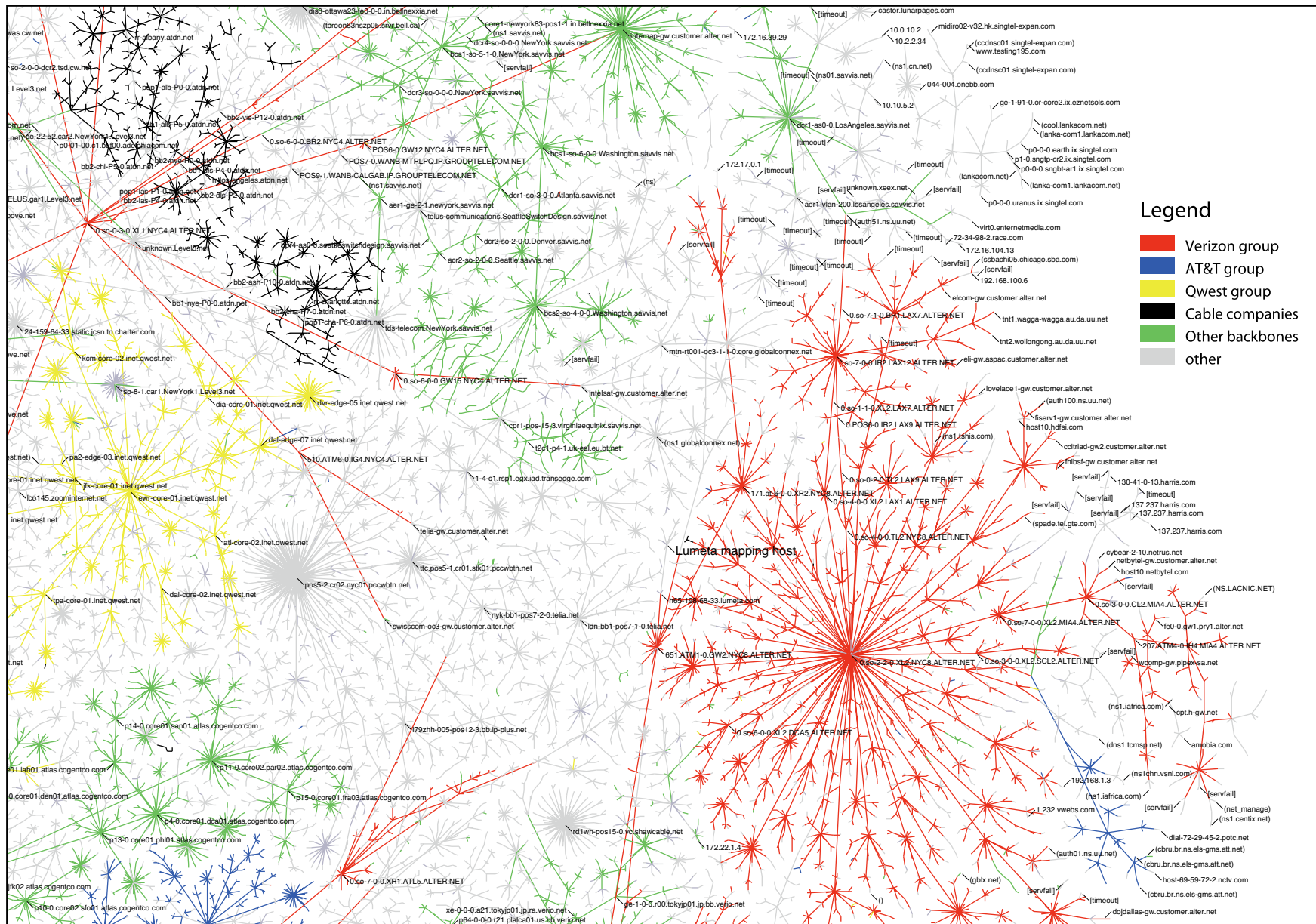
Types of High-Speed Internet

There are four kinds of high-speed Internet service: cable, DSL (Digital Subscriber Line), wireless broadband and satellite. Collectively, they're all referred to as broadband Internet. So what are the differences between them?

Service Type	Estimated Speed	Delivery Method	Installation Method
Cable	Up to 8 Mbps*	Over your cable line and through a cable modem.	Local cable TV provider; coaxial cable wall outlet required
Notes: With cable Internet service, there's no need to log on or off – you're always logged on. And you won't miss any		phone calls, since your phone line isn't used.	
DSL	Up to 6 Mbps*	Over your phone line and through a DSL modem	Local telephone provider; uses your existing phone jacks
Notes: Unlike cable, DSL service is delivered over your existing phone lines. The signal goes through your DSL modem, which converts the signal and sends it over your		phone line back to the phone system; it is then delivered to the Internet. Even though DSL shares the phone line, you can still use your phone when you're online, just like cable.	
Wireless	Up to 1.5 Mbps*	Via local cellular phone towers to modem or PC card	No technician installation or software required
Notes: There are multiple ways to deliver high-speed Internet wirelessly to your home or office or directly to your computer. Local cellular phone towers transmit the signal wirelessly instead of relying on telephone or cable		lines. Benefits to wireless broadband include simple setup and the ability to take your connection with you within the coverage area.	
Satellite	Up to 400 Kbps*	Satellite dish or antenna	Satellite company; satellite dish mounted on your home
Notes: With satellite broadband service, the high-speed Internet signal uploads and downloads directly from the satellite. The benefits of satellite are that it's high-speed, you're always online and it's available to almost anyone		with a clear, unobstructed view of the southern sky. Satellite service is mainly for those who need a high-speed Internet connection but live outside the service area of DSL or cable providers.	

Source: Types of High-Speed Internet

[http://www.bestbuy.com/site/olspage.jsp?id=pcmcat100050001&type=category],
March 2007.

What Are Bits and Bytes?

A "bit" is the smallest unit of information that can be stored in a computer, and consists of either a 1 or 0 (or on/off state). All computer calculations are in bits.

A "byte" is a collection of 8 bits. Bytes are convenient because, when converted to computer mode, they can represent 256 characters, such as numbers or letters. So a byte is 8 times larger than a bit.

Common aggregations for bytes come in multiples of 1,000, such as kilobyte, megabyte, gigabyte, and so on. The progression is as follows:

Bit (b)	**1 or 0**
Byte (B)	**8 bits**
Kilobyte (KB)	**1,000 bytes**
Megabyte (MB)	**1,000 KB**
Gigabyte (GB)	**1,000 MB**
Terabyte (TB)	**1,000 GB**
Petabyte (PB)	**1,000 TB**
Exabyte (EB)	**1,000 PB**
Zettabyte (ZB)	**1,000 EB**

This seems simple enough, except sometimes multiples of bytes are considered as powers of 2, since the original machine language only has two states, 1 or 0. A kilobyte would then be 2^{10} bytes, or 1,024 bytes. A megabyte would be 2^{20} bytes, or 1,024 kilobytes, and so on.

"The Expanding Digital Universe," [http://www.emc.com/about/destination/digital_universe/pdf/May 2006]


Broadband Applications and Download Speeds

DOWNLOAD SPEED	APPLICATION	TECHNOLOGY
56 kbps	Low Quality, Streamlining Audio	Dial Up
200 kbps	FCC Definition of High Speed	DSL Lite: (256 kbps)
1 mbps	Streaming Video	Satellite DSL Cable
4 mbps	Standard TV	DSL
6 mbps	Videoconferencing	
20 mbps	High Definition TV ADSL	

Source: S. Derek Turner, Broadband Reality Check, Free Press, August 2005.

More speed means savings in terms of time − and productivity. For example, to download a 4 gigabyte video file over the Internet will take the following amounts of time:[1]

Japan: ADSL (26 mBps)	20 minutes
Korea: VDSL (20 mBps)	26 minutes
US: cable or ADSL (1.5 mBps)	6 hours
US: dial up	7.5 days
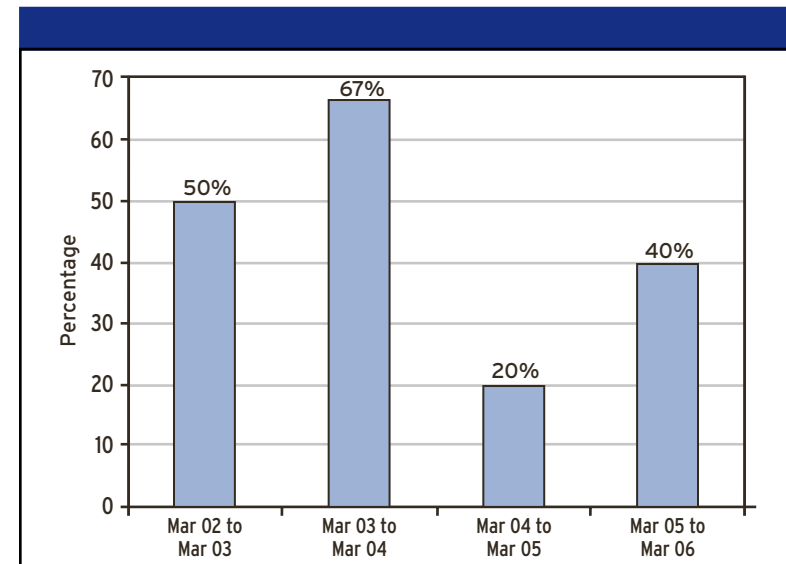
Source: "Home Broadband Adoption," Pew/Internet & American Life Project, May 2006.

[1] Eric Lie and Taylor Reynolds, Birth of Broadband: ITU Internet Reports, September 2003.

As of March 2006, 42% adult Americans – or 84 million people – have highspeed at home, up from 30% who had broadband at home in March 2005. This represents a 40% increase in the number of people with high-speed connections at home over a year's time. To put this growth rate in context, in a comparable timeframe of a year earlier, broadband adoption at home grew by 20% from March 2004 to March 2005. The chart below shows growth rates in broadband adoption in recent years.

Source: "Home Broadband Adoption," Pew/Internet & American Life Project, May 2006.

## III. DEMOGRAPHICS OF INTERNET USERS

Internet usage varies widely among demographic groups. While usage is still rising, limitations on broadband availability has slowed consumer adoption in some parts of the country. Although statistics show that many people go online without any specific reason, inability to access the Internet deprives people of potentially important opportunities.

Internet use differs by age, race and educational attainment

Pew Internet's most recent survey from December 2006 showed the stark differences in Internet usage among various groups in the U.S. More than 80% of people aged 18 to 49 use the Internet, while only 33% of those older than 65 do. And in racial groups, 72% of whites and 69% of English-speaking Hispanics use the Net, while 58% of African-Americans do. Plus, 59% of those with a high school education use the Internet, while 91% of college-educated folks do.

"Pew Internet & American Life Project", [http://www.pewinternet.org/pdfs/PIP_News.and.Broadband.pdf], January 2007.

U.S. Internet Use by Geographic Location, 2006
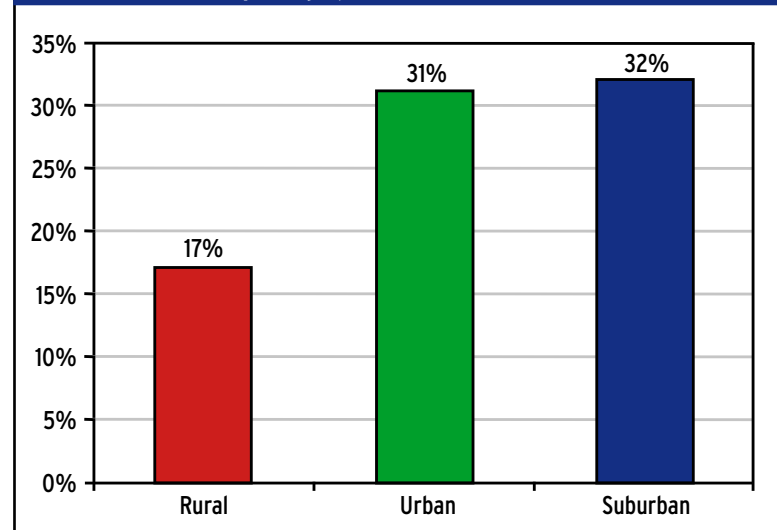
Average U.S. family spends 3.6 hours a day on the Internet

On average, families said they spent 3.6 hours per day using the Internet, 2.5 hours daily watching television and one hour on instant messaging. Sep 26, 06

"Average U.S. Family Spends 3.6 Hours a Day on the Internet," [http://www.itfacts.biz/index.php?id=P7435], September 2006.

30% of Internet users go online without any specific reasons

Some 30% of Internet users go online on any given day for no particular reason, just for fun or to pass the time, according to Pew Internet & American Life Project. Compared to other online pursuits, the act of surfing for fun now stands only behind sending or receiving email (52% of Internet users do this on a typical day) and using a search engine (38% of Internet users do this on a typical day), and is in a virtual tie for third with the act of getting news online (31% of Internet users do this on a typical day). In aggregate figures, this development is striking because it represents a significant increase from the number of people who went online just to browse for fun on a typical day at the

end of 2004. In a survey in late November 2004, about 25 million people went online on any given day just to browse for fun. In December 2005, that number had risen to about 40 million people.

Fallow, Deborah. "Browsing the Web for Fun," [http://www.pewinternet.org/pdfs/PIP_Surfforfun_Feb06.pdf], February 2006.

High-power broadband users prefer Internet over other media for news

Frequent broadband users comprise 40% of the entire population of home broadband users and 44% of all Internet users who get news on the typical day. They are better educated and have higher incomes than other Americans, and, as noted, they are part of an information-elite that shapes how delivery of news and information will evolve online. 71% of high-powered users [those who reported doing 4 or more things online yesterday] get news online on the average day - three times the rate of other high-speed users; 59% get news on the average day from local TV; 53% get news on the typical day from radio; 52% get news on the average day from national TV newscasts; 43% get news on the average day from the local paper; 21% get news on the average day from a national newspaper, Pew Internet & American Life Project reports.

Horrigan, John B. "For Many Home Broadband Users, the Internet is a Primary News Source," [http://www.pewinternet.org/pdfs/PIP_News.and.Broadband.pdf], March 2006.

33% of adults over 65 use the Internet

Broadband enhances life for seniors in a number of ways including enhancing communications with family and friends; expanding opportunities for lifelong learning; improving the delivery of health care services; supporting independent living; and creating new options for entertainment.

"Pew Internet & American Life Project", [http://www.pewinternet.org/pdfs/PIP_News.and.Broadband.pdf], January 2007.
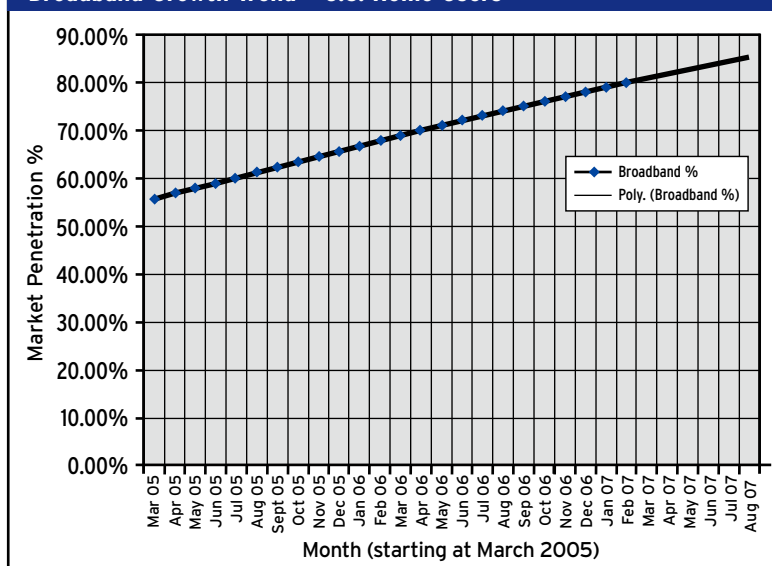
Internet Useage by Family Income
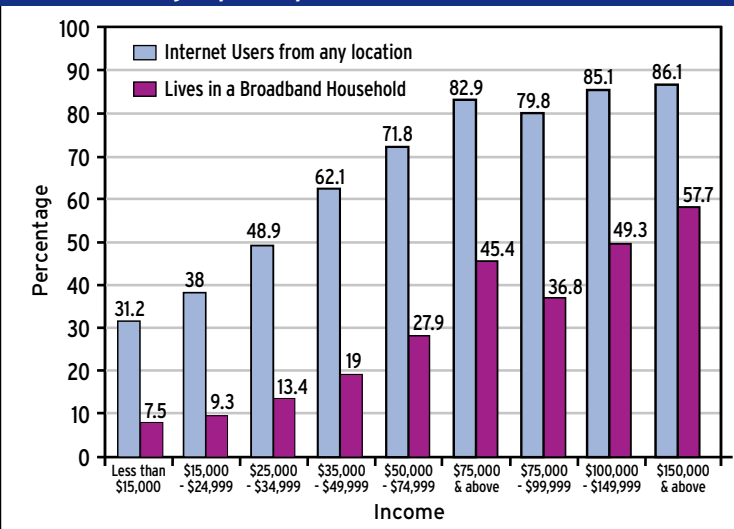
Source: U.S. Census Bureau, 2003

Broadband Growth Trend – U.S. Home Users

Extrapolated by Web Site Optimization, LLC from Nielsen/NetRatings data

In January 2007, broadband penetration in U.S. homes grew 0.62 percentage points to 79.03%, up from 78.45% in December. This increase of 0.62 points is below the average increase in broadband of 0.9 points per month over the last 6 months. At current growth rates U.S. broadband penetration should break 80% among active Internet users by March 2007.

"US Broadband Penetration Breaks 80% Among Active Internet Users," [http://www.websiteoptimization.com/bw/0703], February 2007.

Less than 25% of rural Americans have broadband connections

By the end of 2005, 24% of rural Americans had high-speed Internet connections at home compared with 39% of adult Americans living elsewhere. In 2003, 9% of rural Americans had broadband at home, less than half the rate (22%) of urban and suburban Americans. For overall Internet use (by whatever connection from any location), the penetration rate for adult rural Americans lagged the rest of the country by 8% at the

end of 2005 (a 62% to 70% margin). This is about half the gap that existed at the end of 2003, Pew Internet & American Life Project reports.

Horrigan, John & Murray Katherine, "Rural Broadband Internet Use," [http://www.pewinternet.org/pdfs/PIP_Rural_Broadband.pdf], February 2006.

Rural broadband penetration remains 10 percentage points behind the national average

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. In 2006, 25% of rural adults reported a home broadband connection compared to 44% of urban adults.

John B. Horrigan, "Home Broadband Adoption 2006," Pew Internet & American Life Project, May 28, 2006.

IV. U.S. DEPLOYMENT

Today Americans use the Internet more than ever. In the last decade, the Internet has become a fixture of daily life for the majority of Americans – in part because the availability of high-speed broadband connections has made online communications easier and more reliable.

42% of all Americans had broadband at home by March 2006

As of March 2006, 42% of American adult enjoyed broadband access in their home, a substantial increase from March 2005 when 30% of adults had home broadband.

"Home Broadband Adoption 2006", Pew Internet & Amercian Life Project, May 2006

U.S. broadband connections reached 64.6 million in June 2006

The number of broadband connections climbed 26% during the first half of 2006 to 64.6 million lines. About 50.3 million of these high-speed lines served residential users.

"High-Speed Services for Internet Access: Status as of June 30, 2006" [http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-270128A1.pdf], January 2007.

Broadband users spend 33% more time on line than those with dial up

Broadband users spent 33% more time online than dial-up users (35 hours for the month), compared with 26 hours and some change for dial-up. Broadband users also viewed twice as many Web pages, according to Nielsen/NetRatings.

"Three Quarters of Web Users on Broadband," [http://www.msnbc.msn.com/id/16174787], December 2006.

## 72% of Americans who use the Internet have broadband

Nielsen/NetRatings announced that nearly three-quarters of U.S. active Web users connected at home via broadband in May, growing 15% over a year ago, when just 57% of active Web users relied on broadband connections at home. Research also indicates that broadband users are more likely to make better use of Internet functionalities and newer technologies, such as Rich Site Summary (RSS) feeds and blogging. While in May 2005, 43% of Americans were on narrowband connections, and 57% were on broadband, in May 2006 the share of narrowband went down to 28%. The total number of home broadband users has grown 30% YTY, from 78.6 million in May 2005 to 102.5 million in May 2006, while the number of narrowband users has dropped 31% in the same time period, from 58.8 million to 40.3

million. Broadband composition remains high in the workplace, with 90% saturation in May 2006; a year ago that figure was at 82%.

Bausch, Suzy & Han, Leilani, "U.S. Broadband Composition Reaches 72% at Home, a 15 Point Year-Over-Year Increase, According to Nielsen/Netratings," June 2006.
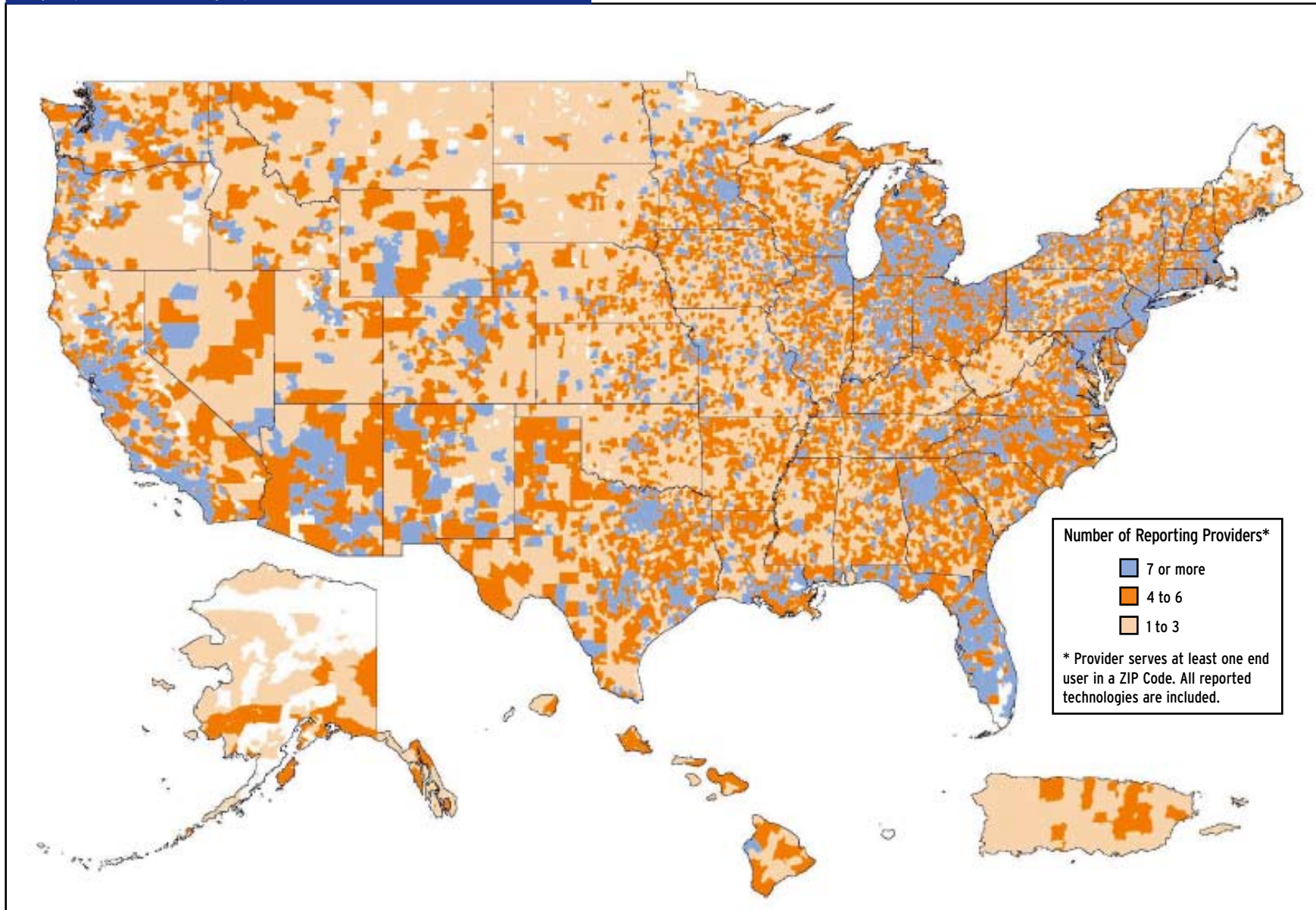
High Speed Line Growth 1999 - 2005
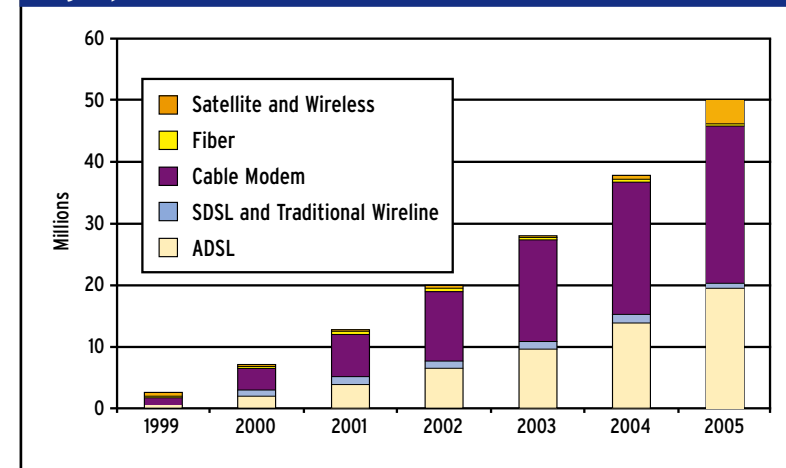
Source: FCC'S High Speed Services for Internet Access Report, July 2006

BROADBAND PROVIDERS BY ZIP CODE

High Speed Providers by Zip Code (As of June 30, 2005)

Number of Reporting Providers*

- 7 or more
- 4 to 6
- 1 to 3

* Provider serves at least one end user in a ZIP Code. All reported technologies are included.

Source: FCC

BPL to increase from 400,000 to 2.5 million by 2011

The number of U.S. households subscribing to broadband over power line (BPL) services will increase from 400,000 in 2007 to 2.5 million by 2011, according to a report from Parks Associates.
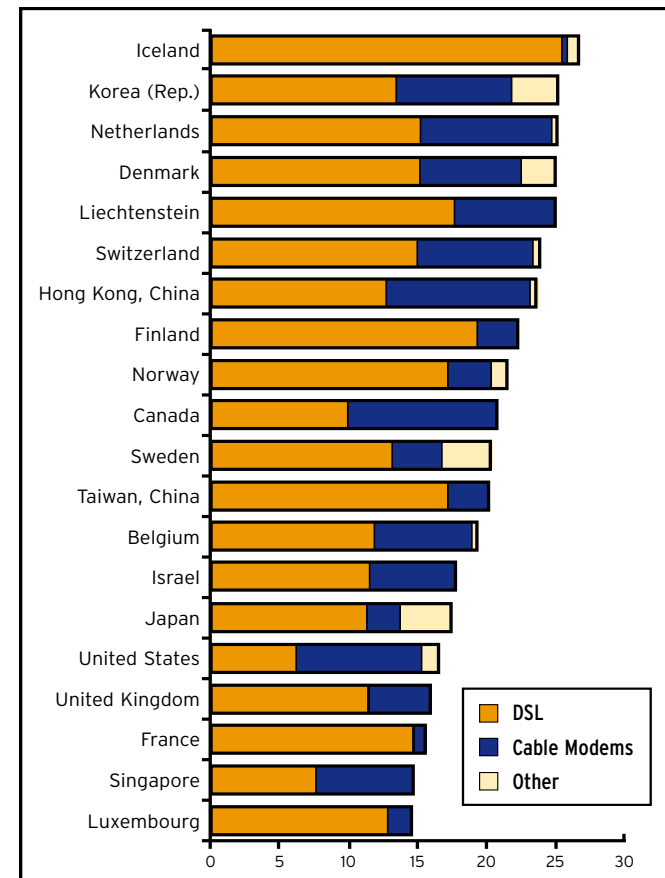
"Broadband Penetration by Technology, Top 20 Economies Worldwide" [http://www.itu.int/ITU-D/ict/statistics/at_glance/top20_broad_2005.html], December 2005.

V. INTERNATIONAL RANKINGS

America is lagging behind other nations in terms of access, speed and competitive pricing of broadband services. The following international rankings illustrate our status among other nations.

Broadband penetration by technology, top economies worldwide, December 2005

Legend:
- DSL
- Cable Modems
- Other

Countries (top to bottom): Iceland, Korea (Rep.), Netherlands, Denmark, Liechtenstein, Switzerland, Hong Kong, China, Finland, Norway, Canada, Sweden, Taiwan, China, Belgium, Israel, Japan, United States, United Kingdom, France, Singapore, Luxembourg

X-axis: 0, 5, 10, 15, 20, 25, 30

U.S. Ranks 16th in the World – paying twice as much for connections with 1/20th the speed.

The U.S. is 16th in the world in broadband penetration, according to the International Telecommunication Union (ITU). When the ITU measured a broader "digital opportunity" index (considering price and other factors) we were 21st – right after Estonia. Asian and European customers get home

connections of 25 to 100 megabits per second (fast enough to stream high-definition video). Here, we pay almost twice as much for connections that are one-twentieth the speed.

Copps, Michael J. "America's Internet Disconnect," [http://www.washingtonpost.com/wp-dyn/content/article/2006/11/07/AR2006110701230.html], November 2006.

U.S. definition of broadband is 6 times slower than universal standards

The FCC's 200 kbs broadband definition is roughly six times slower than universal standards.

"FCC Issues Report on the Availability of High-Speed and Advanced Telecommunications Services," [http://www.fcc.gov/Bureaus/Common_Carrier/News_Releases/2000/nrcc0040.html], August 2003.

Japanese can get 8.5 times the speed for one-twelfth the cost

U.S. consumer pay more for slower speeds. In the U.S., DSL generally reaches speeds of up to 1.5 – 3.0 mbps at a price averaging $30-$50 per month (not including fees) while cable modems generally reach speeds of 3-5 mbps for $40-$50 per month. In Japan, the cost of an average connection with the speed of 26 mbps costs about $22. The contrast is even more striking when expressed in terms of cost per 100 kbps. The top speed generally available in Japan is 51 mbps at a cost of $0.06 per 100 kbps. The top speed generally available in the U.S. is 6 mbps available at a cost of $0.72 per 100 kbps. In other words, the Japanese have 8.5 times the speed at 1/12 of the cost.

"CWA:Speed Matters," [http://files.cwa-union.org/speedmatters/SpeedMattersCWAPositionPaper.pdf], October 2006.

VI. CONSUMER BENEFITS OF BROADBAND

Thanks to a surge in the number of home broadband connections, the number of Americans who telecommute at least part of the time has grown from 4 million in 1990 to 45 million in 2006. In addition to improving work-life balance, telecommuting also saves fuel and increases worker productivity. In the event of a pandemic, natural disaster or threat to national security, people can stay informed and connected, even providing essential services in times of crisis. Broadband also delivers important healthcare benefits, enabling remote monitoring of patients and real time exchange of medical data and images between distant medical specialists.

79% of office workers believe telecommuting improves work-life balance

79% of all office workers agree that allowing employees to work remotely improves their work-life balance.

"Avaya 2005 Global Research Report", January 2006.

Broadband telework - time savings equivalent to 4 weeks of vacation a year

A survey conducted by Sage Research offers further evidence of the benefits of IP communications. 100 organizations that have deployed IP communications reported an average benefit of 4.3 hours per week (or 28 days a year) for each remote worker.

Governments save $3,000 for every telecommuter

Every worker who begins telecommuting could reduce government transportation spending by $3,000, according to a study by George Washington University's Center for Economic Research.

Telecommuting could save $3.9 billion a year in fuel – reduce congestion, greenhouse gases, and dependence of foreign oil

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 jobs -- reducing our dependence on foreign oil, traffic congestion, and greenhouse gas emissions at the same time.

"2005/2006 National Technology Readiness Survey," [http://www.rhsmith.umd.edu/ntrs/NTRS-2005-06.pdf], July 2006.

Internet technologies have inherent advantages in offering resiliency to attacks

The Internet's inherent network efficiencies were on display on September 11th prompting the National Academies of Science to find afterwards that the Internet held up better than other communications technologies on that fateful day. Among the thousands of casualties on 9/11 was our outdated communications infrastructure. According to the National Academies on 9/11, 95% of cell phone calls at 11 a.m. failed to get through, the central office for the phone system cut off 300,000 landline phones, television stations were knocked off the air, police and Fire Department radios failed. In fact, only 2% of Internet addresses remained off-line for an extended period. 9/11 demonstrated the Internet's overall resilience to attacks thru its flexibility, and adaptability.

"The Benefits of Universally-Available Broadband are Enormous," [http://www.benton.org/index.php?q=node/5026], March 2006.

Broadband could save seniors $800 billion in health costs over 25 years

Policies designed to accelerate the use of broadband could save seniors more than $800 billion by reducing health care costs. 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 U.S. currently spends annually for health care for all its citizens.

Litan, Robert E. "Great Expectations: Potential Economic Benefits To The Nation From Accelerated Broadband Deployment To Older Americans And Americans With Disabilities," [http://www.newmillenniumresearch.org/archive Litan_FINAL_120805.pdf] December 2005.

Remote patient monitoring could cut overall health care expenditures by 25%

Broadband-based remote monitoring for all chronically ill patients could reduce hospital, outpatient, and drug expenses by 30% – reducing overall health care expenses for the U.S. by roughly 25%, or about $350 billion annually.

Litan, Robert E. "Massive Economic Benefits Foreseen: Ultra-fast telemedicine and telecommuting can save money and improve quality of life," [http://www.broadbandproperties.com/2006issues/feb06issues/Litan%20-%20Health%20and%20Medicine.pdf], February 2006.

Internet Video

The Internet is experiencing an unprecedented surge in traffic that will strain the capacity of the current infrastructure. Unless we prepare for it, consumer downloads of high definition television shows, movies and music, just to name a few examples, could slow the networks and disrupt services that cannot tolerate transmission delays. Continued investment in network infrastructure is necessary to handle growing demands and ensure that Americans enjoy the full benefits of the Internet.

46% of online users watch an online video at least once a week

More than half of Internet users have watched or downloaded video. News clips were the most popular, seen by 72% of online video viewers, followed by short movie and TV clips, music videos, sports highlights and user-generated amateur videos, AOL/AP survey says. 7% of video users have paid to watch any video online. Nearly 75% of online video users prefer free videos

with ads. 46% of video watchers with high-speed service view video at least once a week, compared with 22% of dial-up users. Dial-up users also were more likely to complain about download times.

"46% of Online Users Watch an Online Video At Least Once a Week," [http://blogs.zdnet.com/ITFacts/?p=11663], September 2006.

News leads the way in frequency of viewing, with 27% of online video viewers watching at least once a week, followed closely by funny videos (26% watch at least once a week). Online video viewing is very common at home (39% of those with home Internet access watch at least once a week) compared to 19% of those who watch at least once a week at work, according to Online Publishers Association. When it comes to finding the videos they watch, Internet users often rely on a handful of specific sites. Half of all video viewers go to a specific Web site to find video, and 58% say they rely on two to five sites. Another popular way to find video is through random surfing, which is done by 48% of video viewers. Online video advertising is being viewed regularly and leads to specific actions. 66% of video viewers have watched online video ads, and 44% of those have taken action on what they've seen. Visiting a Web site ranks highest at 31%, while 8% are actually driven to make a purchase. Video ad watchers generally prefer short ads, however 39% said they would watch ads lasting longer than 30 seconds.

"Online Video Achieving Mass Appeal With News Leading the Way, According to Online Publishers Association Study," [http://www.online-publishers.org/?pg=press&dt=032906], March 2006.

6 million U.S. households downloaded peer-to-peer (P2P) video, 1.2 million paid for legal videos

Among U.S. households, with members who regularly use the Internet, 8% (6 million households) downloaded at least one digital video file (10MB or larger) from a P2P service for free in Q3 2006, NPD Group says. Nearly 60% of video files downloaded from P2P sites were adult-film content, while 20% was TV show content and 5% was mainstream movie content. In Q3 2006 2%

of U.S. households (1.2 million) with Internet access paid for a video download from an online download store. Apple's iTunes led the market for paid digital video downloads, with 90% of downloads occurring on that site, followed by Vongo (5%), Movielink (3%) and less than 1% for CinemaNow. 62% was TV program content, 24% was music video content and 6% was mainstream movie content.

"The NDP Group: Peer-to-Peer Digital Video Downloading Outpacing Legal Alternatives Five to One," [http://www.npd.com/press/releases/press_061220.html], December 2006.

9.2 million Americans have downloaded a podcast, 5.6 million downloaded video

Nielsen/NetRatings announced that 6.6% of the US adult online population, or 9.2 million Web users, have recently downloaded an audio podcast; 4.0%, or 5.6 million Web users, have recently downloaded a video podcast. These figures put the podcasting population on a par with those who publish blogs, 4.8%, and online daters, 3.9%. However, podcasting is not yet nearly as popular as viewing and paying bills online, 51.6%, or online job hunting, 24.6%.

As is often typical with new technologies, young people are more likely than their older counterparts to engage in audio or video podcasting. Web users between the ages 18 – 24 are nearly twice as likely as the average Web user to download audio podcasts, followed by users in the 25-34 and 35-44 age groups, who were also more likely than the average Web user to do audio podcasting. Video podcasters trended a little older, with 25-34 year olds indexing the highest. Web users above the age of 45 were less likely than average to engage in podcasting of either sort.

Bausch, Suzy & Han, Leilani. "Podcasting Gains an Important Foothold Among U.S. Adult Online Population, According to Nielsen/NetRatings," [http://www.netratings.com/pr/pr_060712.pdf], July 2006.

iTunes Player Usage Grows 47.5% in 2006					
PLAYER	NOV 05	JAN 06	NOV 06	JAN 07	YOY
Apple QuickTime	11,771	12,817	12,670	13,934	8.7%
iTunes	13,922	18,568	23,460	27,396	47.5%
RealPlayer	26,262	28,687	30,566	31,309	9.1%
Windows Media Player	68,758	71,112	71,705	72,510	2.0%

"iTunes Player Usage Grows 47.5% in 2006," [http://www.websiteoptimization.com/bw/0702/], February 2007.

iTunes: Videos Drive Downloads

Peak increase of 140% in iTunes bandwith consumption **Sept. 2006**
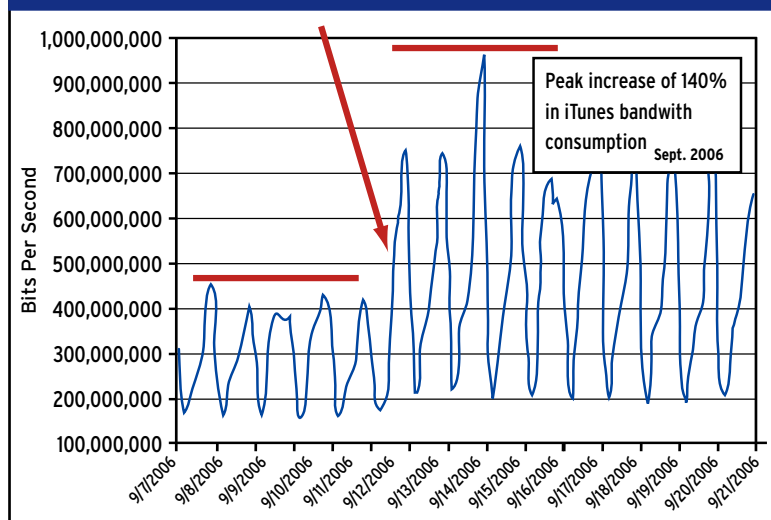
"iTunes: Video Drive Downloads," [http://sandvine.com/], September 2006.

Streaming video and music to generate $27 billion by 2011

Streaming video and music on the Web and mobile devices will generate $27 billion in revenue by 2011, according to Insight Research. Insight projects a 32% compound annual growth rate (CAGR) for the streaming media market. In the U.S., Internet video ads brought in $225 million in 2005 and are expected to break the $1 billion mark in 2008, according to eMarketer.
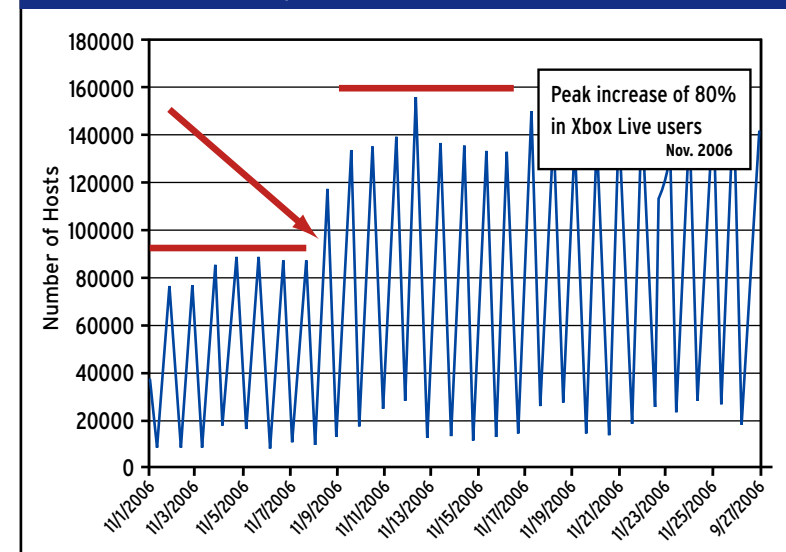
"Internet Video Services to Generate $7 bln by 2010," [http://www.itfacts.iz/index.php?id=P8078] February 2007.

100 million casual game players online

There are more than 100 million regular casual-game players, whose demographic is more representative of middle America than most gamer circles, having equal numbers of women and men and an average age above 35.

Gnatek, Tim. "Just for Fun, Casual Games Thrive Online," [http://www.nytimes.com/2006/02/23/technology/circuits/23basics.html?ex=1173844800&en=de311b429f8f95f7&ei=5070], February 2006.

Xbox Live: New Games, More Users

Peak increase of 80% in Xbox Live users **Nov. 2006**

"Xbox Live: New Games, More User," [http://sandvine.com/], November 2006.

Total number of U.S. video uploaders is comparable to U.S. online gamblers

Viewing and creating video have become significant activities for U.S. Internet users, with 31% watching online videos at least monthly and 8% uploading clips to Websites such as YouTube, according to Parks Associates. The majority of monthly "video uploaders" are young, predominately 18-24 years old, with men only slightly more likely than women to upload video. Further, the total number of uploaders is comparable to the number of monthly online gamblers.

"Video Uploaders almost equal in number to Online Gamblers," [http://newsroom.parksassociates.com/article_display.cfm?article_id=1384], September 2006.

YouTube facts:
70% of users are American, 50% are under 20, Total world-wide viewing time adds up to over 9,305 years

Wall Street Journal's Lee Gomes published various statistics regarding YouTube, the Internet's top video destination. 70% of YouTube's registered users are American and roughly half are under 20 years of age. YouTube videos take up an estimated 45 terabytes of storage. The total time the people of the world spent watching YouTube is 9,305 years.

"Top Video Sites: MSN Video, YouTube, Google Video," [http://blogs.zdnet.com/ITFacts/?p=10410] March 2006.

55% of social network visitors view streaming videos

Users who frequent social networking sites such as MySpace show a predilection for online video, with 55% viewing streaming videos and 21% downloading long-form videos on at least a monthly basis, according to Parks Associates. People who visit a social networking site at least weekly are overall 6 times more likely to download long-form videos and 1.5 times more likely to view streaming Internet videos than are those who do not use these websites.

The number of new videos uploaded daily on YouTube.com jumped from 20,000 in the beginning of 2006 to 65,000 in beginning of 2007.

YouTube is currently serving 100 million videos per day, with more than 65,000 videos being uploaded daily. According to Hitwise, YouTube videos account for 60% of all videos watched online and people are spending an average of 17 minutes per session on the site. According to Nielsen/NetRatings, YouTube has nearly 20 million unique users per month.

20% of all TV households to have Internet Protocol Television (IPTV) by year-end 2010

The number of households worldwide with broadband will grow from 184 million in 2005 to near 400 million by the end of 2010. The IPTV share of the global digital television market will grow from 6% of all households at the end of 2006 to nearly 20% by the end of 2010, with robust deployment in Asian and European markets in particular. By the end of 2006, there will be 51 million broadband households in Western Europe. By 2010 that number will have increased to 80 million, Parks Associates says.

VII. BROADBAND FUELS ECONOMIC GROWTH

In addition to the benefits provided individual users, broadband is a powerful force for national economic growth and job creation. Experts estimate that broadband could add as much as half a trillion dollars and 1.2 million jobs to the U.S. economy. Video over the Internet alone could generate 12.6 billion dollars in the next 3 years.

Universal broadband could add $500 billion to the economy

U.S. economy could gain $500 billion in additional benefits from universal broadband deployment.

Crandall, Robert W. & Jackson, Charles L. "The $500 Billion Opportunity: The Potential Economic Benefit of Widespread Diffusion of Broadband Internet Access," July 2001.

Failure on broadband could reduce U.S. productivity 1% per year

Failure to improve broadband performance could reduce U.S. productivity by 1 percentage point or more per year.

(Ferguson, C. The U.S. Broadband Problem: Analysis and Recommendations. Brookings Institution Working Paper, 2002.)

89% of U.S. small and medium businesses have broadband

U.S. small and medium businesses are heavy users of basic computing technology with high adoption rates for servers with local area networks (88%) and high-speed Internet access (89%), Forrester Research says.

Barnard, Patrick. "Forrester Predicts Drivers in IT Market for 2006," [http://www.tmcnet.com/news/2006/02/02/1335891.htm], February 2006.

Internet video services will generate $1.7 billion by 2010

Internet video services are on the brink of becoming a mainstream phenomenon in the U.S. According to IDC, Internet video services will generate over $1.7 billion in revenues by 2010, an increase of more than $1.5 billion from 2005 totals. Much of this growth will be fueled by a surge in the amount of premium content made available online.

"Billion Dollar Opportunity: Internet Video Services Primed for Explosive Growth, According to IDC," [http://www.idc.com/getdoc.jsp?containerId=prUS20 114806], April 2006.

Video on demand (VOD) to generate $13 billion by 2010

iSuppli is predicting the global video-on-demand market will grow to nearly $13 billion by the year 2010. While 2006 will be a banner year for the VOD market, the real explosive growth will begin in 2008 when these delivery systems begin to mature. By 2010, the global VOD market will generate more than $12.6 billion in revenue, up from $1.7 billion in 2006.

"VOD market to grow to nearly $13bn by 2010," [http://www.engineerlive.com/news/16396/vod-market-to-grow-to-nearly-and3613bn-by-2010.thtml], April 2006.

IPTV subscriptions to generate $13.2 billion in 2010

Worldwide subscriptions to IPTV will rise from 3 million in 2005 to almost 49 million in 2010. Revenue will also grow rapidly, from

Worldwide VOD Revenue Forecast by Video Operator Type (Millions of Dollars)
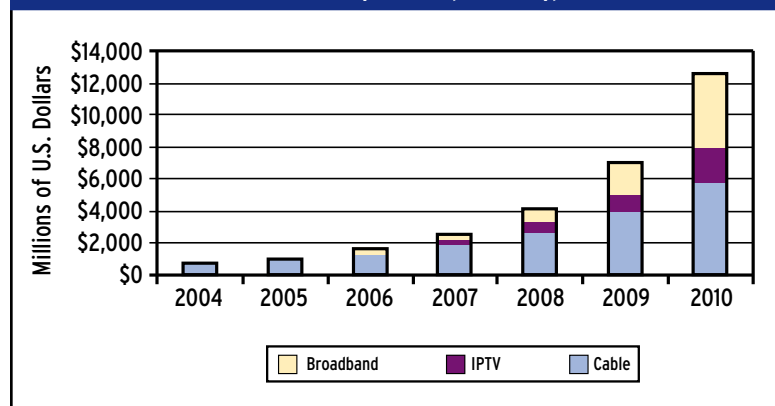
$401 million in 2005 to $13.2 billion by the end of the forecast period, Gartner reports. Aug 27, 06
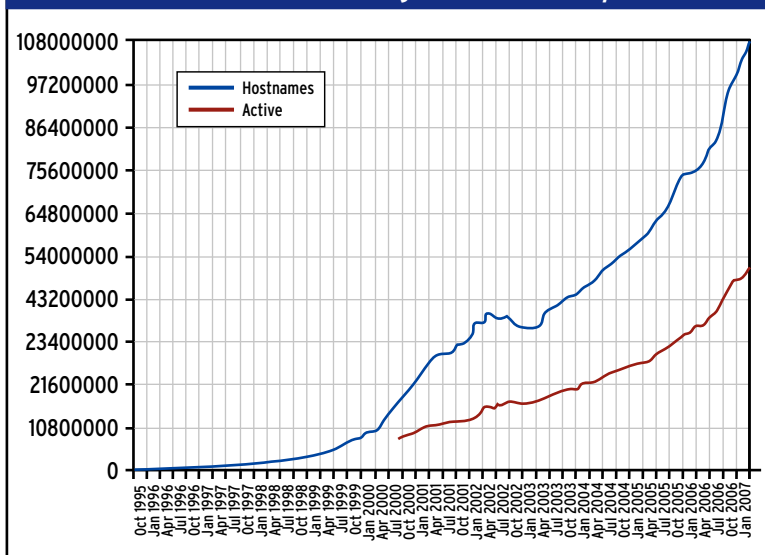
"3.6 mln IPTV subscribers in 2006," [www.itfacts.biz/index.php?id=P8086], February 2007.
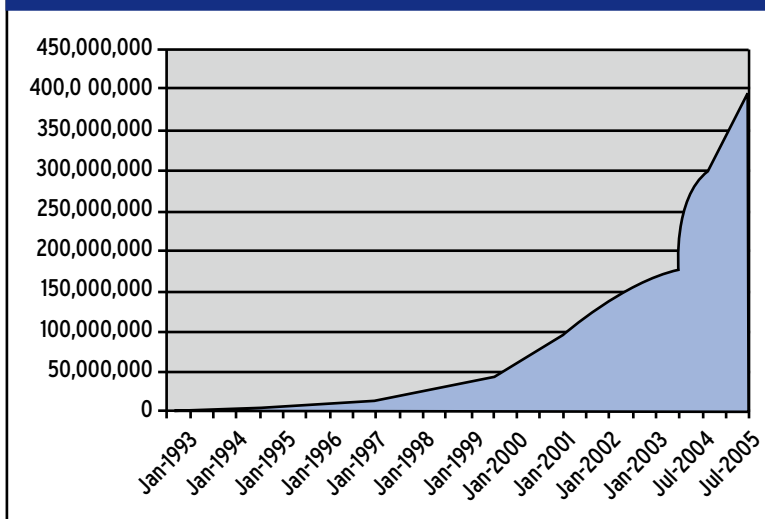
VIII. INTERNET TRAFFIC GROWTH

The explosive growth in video applications and downloads is threatening to strain the networks' capacity. With a growing number of businesses competing to offer online services, the need to expand capacity is growing greater on an almost daily basis.

Total Sites Across All Domains – August 1995 - January 2007

Legend:
- Hostnames
- Active

Y-axis: 0, 10800000, 21600000, 23400000, 43200000, 54000000, 64800000, 75600000, 86400000, 97200000, 108000000

X-axis: Oct 1995, Jan 1996, Apr 1996, Jul 1996, Oct 1996, Jan 1997, Apr 1997, Jul 1997, Oct 1997, Jan 1998, Apr 1998, Jul 1998, Oct 1998, Jan 1999, Apr 1999, Jul 1999, Oct 1999, Jan 2000, Apr 2000, Jul 2000, Oct 2000, Jan 2001, Apr 2001, Jul 2001, Oct 2001, Jan 2002, Apr 2002, Jul 2002, Oct 2002, Jan 2003, Apr 2003, Jul 2003, Oct 2003, Jan 2004, Apr 2004, Jul 2004, Oct 2004, Jan 2005, Apr 2005, Jul 2005, Oct 2005, Jan 2006, Apr 2006, Jul 2006, Oct 2006, Jan 2007

Number of Hosts Advertised in DNS

Y-axis: 0, 50,000,000, 100,000,000, 150,000,000, 200,000,000, 250,000,000, 300,000,000, 350,000,000, 400,0 00,000, 450,000,000

X-axis: Jan-1993, Jan-1994, Jan-1995, Jan-1996, Jan-1997, Jan-1998, Jan-1999, Jan-2000, Jan-2001, Jan-2002, Jan-2003, Jul-2004, Jul-2005

Source: "Internet Systems Consortium, Internet Domain Survey," January 2006

YouTube today consumes as much bandwidth as the entire Internet consumed in the year 2000.

Dell, Michael. Consumer Electronics Show Las Vegas," [http://www.cesweb.org/docs/Dell_2007transcript.doc], January 2007.

Downloading a single half hour TV show on the web consumes more bandwidth than does receiving 200 emails a day for a full year. Downloading a single high definition movie consumes more bandwidth than does the downloading of 35,000 web pages; it's the equivalent of downloading 2,300 songs over Apple's iTunes web site.

"Craig Moffett of Bernstein Research, Senate Committee Testimont," [http://commerce.senate.gov/pdf/moffett-031406.pdf], March 2006.

The growth in video downloads could create an Internet traffic jam that threatens the net's development... The web infrastructure - and even Google's - doesn't scale.

"Rise of Video Downloads Threatens Gridlock on Net," [http://tech.netscape.com/story/2007/02/10/rise-of-video-downloads-threatens-gridlock-on-net], February 2007.

Peer-to-peer video will account for 30-40% of total traffic in 2007.

"Craig Moffett of Bernstein Research, Senate Committee Testimont," [http://commerce.senate.gov/pdf/moffett-031406.pdf], March 2006.
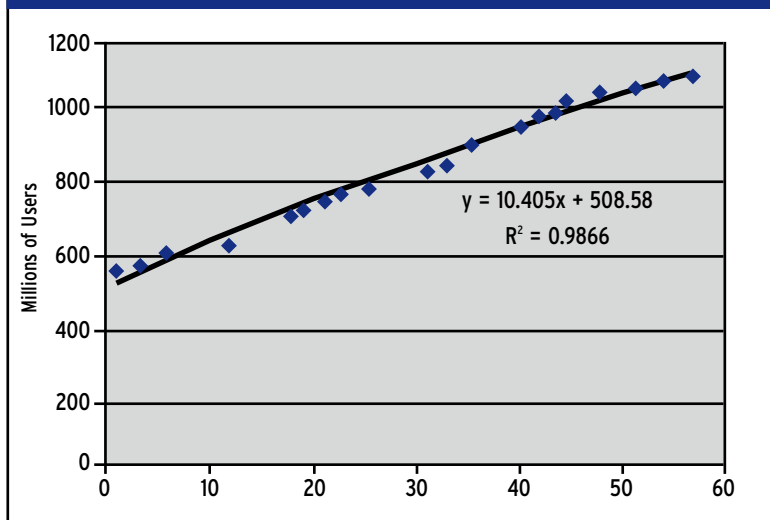
- 107 million Americans viewed online video in 2006
- 123 million Americans will view online video in 2007
- 157 million Americans will view online video in 2010

"Internet Video Audience," [Emarketer.com], November 2006.

In 2010, just 20 homes using the latest broadband technology to access video content will generate enough traffic to equal the entire load on the Internet in 1995.

Duffy, Jim. "Bandwidth Prices Stabilizing Based on Additional Factors, Consolidation," [http://www.networkworld.com/newsletters/optical/2007/0219optical1.html], February 2007.

Global Internet User Estimate

$$y = 10.405x + 508.58$$
$$R^2 = 0.9866$$

Source: "Global Internet User Estimate," [http://www.allaboutmarketresearch.com/internet.htm], January 2007.

YouTube was founded in February of 2005. Now they are serving 100 million video downloads a day.
Source: YouTube corporate website

Netflix ships 1.4 million DVDs every day. They spend $300,000,000 a year on postage. They plan to begin delivering movies over the Internet.
Source: Netflix corporate website

WalMart accounts for 40% of all DVD sales in America. They also plan to start delivering movies on the web.
Source: Reuters, 2/6/07

Downloading a high-definition movie takes more bandwidth than viewing 35,000 web pages. It's like downloading 2,300 songs from the iTunes music store.
Source: Craig Moffett, Amelia Wong and Judah Rifkin, Testimony before the Senate Commerce Committee, March 14, 2006.)

A significant portion of Internet traffic is generated by peer-to-peer file sharing - specifically the sharing of audio, image of video files. Here is a partial list of the devices currently capable of creating or capturing information, and sharing it across the Internet:

DEVICE	MILLIONS IN 2006
Digital Cameras	400
Camera Phones	600
PCs	900
Audio Players	550
Mobile Subscribers	1,600
LCD/Plasma TVs	70

By 2010, devices will be cheaper, image resolutions higher, and this base of devices and subscribers will be 50% larger.
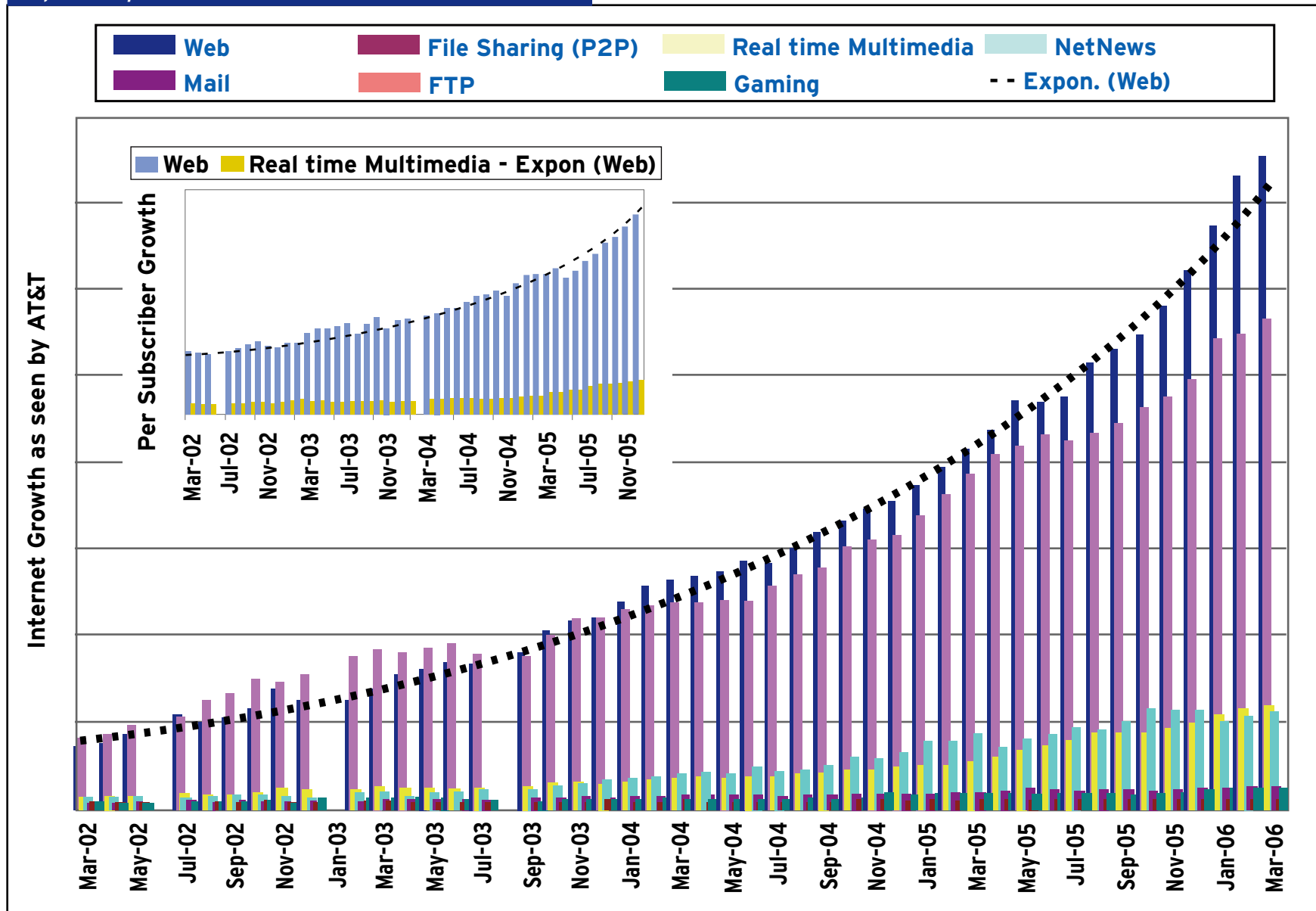Source: IDC Whitepaper

Spam has doubled in the last year, and each spam email is up to 10 times the size of traditional spam.
Source: MSNBC 1/19/07

Exponentially More Volume: IP Traffic

Legend: Web, Mail, File Sharing (P2P), FTP, Real time Multimedia, Gaming, NetNews, Expon. (Web)

Inset legend: Web, Real time Multimedia - Expon (Web)

Y-axis (main chart): Internet Growth as seen by AT&T

Y-axis (inset): Per Subscriber Growth

X-axis (main chart): Mar-02, May-02, Jul-02, Sep-02, Nov-02, Jan-03, Mar-03, May-03, Jul-03, Sep-03, Nov-03, Jan-04, Mar-04, May-04, Jul-04, Sep-04, Nov-04, Jan-05, Mar-05, May-05, Jul-05, Sep-05, Nov-05, Jan-06, Mar-06

X-axis (inset): Mar-02, Jul-02, Nov-02, Mar-03, Jul-03, Nov-03, Mar-04, Jul-04, Nov-04, Mar-05, Jul-05, Nov-05

Source: AT&T, March 2002-2006 Data.

North American Revenues by Source							
Category	2005	2006	2007	2008	2009	2010	CAGR
Broadband Music Revenues[1]	$6.5	$10.8	$15.3	$20.5	$24.7	$29.1	1.35%
On-line Gaming[2]	$0.9	$1.3	$1.9	$2.4	$2.9	$3.3	30%
VoD Revenues[3]	$0.5	$1.0	$1.9	$3.0	$3.8	$4.4	54%
IPTV Revenues[4]	$0.1	$0.4	$0.7	$1.3	$2.1	$2.9	97%
	$8.1	$13.6	$19.9	$27.2	$33.4	$39.7	38%

1 - Ovum, Aleksandra Bosnjak and Michelle MacKenzie, September 2006
2 - Ovum, Aleksandra Bosnjak and Jonathan Arber, August 2006
3 - Ovum, Aleksandra Bosnjak, August 2006
4 - Ovum, Aleksandra Bosnjak and Annelise Berendt, August 2006

Internet video could soon consume 10 times the Internet's current yearly traffic

Each year the original content on the world's radio, cable and broadcast television channels adds up to about 75 petabytes of data -- or, 10 to the 15th power. If current estimates are correct, the two-year-old YouTube streams that much data in about 3 months. But a shift to high-definition video clips by YouTube users would flood the Internet with enough data to more than double the traffic of the entire cybersphere. And YouTube is just one company with one application that is itself only in its infancy. Given the growth of video cameras around the world, we could soon produce 5 exabytes of amateur video annually. Upgrades to high-definition will in time increase that number by another order of magnitude to some 50 exabytes or more, or 10 times the Internet's current yearly traffic.

Swanson, Bret. "The Coming Exaflood," Wall Street Journal, January 2007.

## 163 million concurrent video streams to be delivered by 2011

Concurrent VOD streams worldwide will explode from 1.67 million in 2005 to 163 million in 2011, according to ABI Research.

"Video-on-Demand Evolution to IP and Ad-Insertion," [http://www.abiresearch.com/products/market_research/Video-on-Demand_Evolution_to_IP_and_Ad-Insertion], October 2006.

## BitTorrent accounts for as much as 40% of all Internet traffic

BitTorrent said traffic generated by millions of its users now accounts for as much as 40% of all worldwide Internet traffic.

"BitTorrent Secures $20 Million in Venture Capital," [http://www.bittorrent.com/about/press/bittorrent-secures-20-million-in-venture-capital], December 2006.
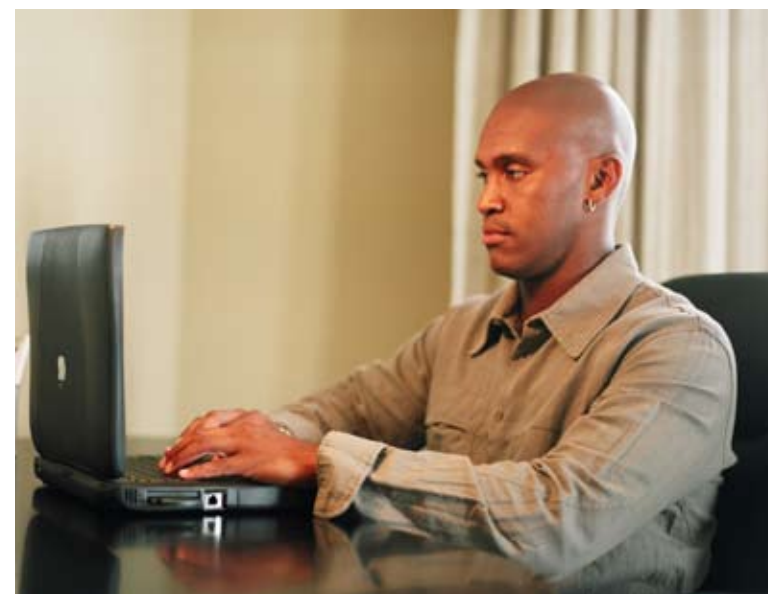
Internet Protocol Trends (1)
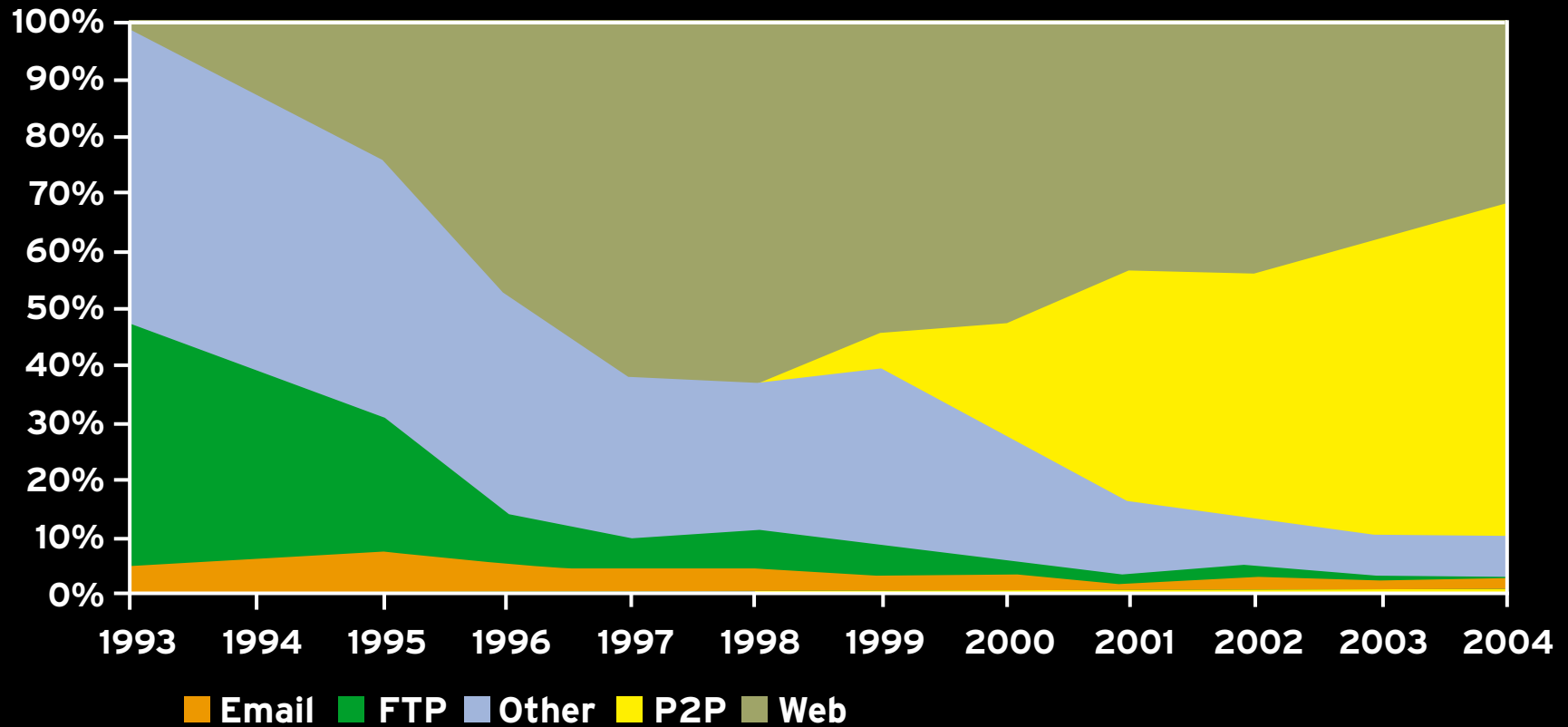
Source: CacheLogic "P2P in 2005," September 2005.. Competit.

Households will use 1.1 terabits per month by 2010 meaning that 20 homes will generate more traffic then the entire Internet did in 1995.

Household bandwidth demand continues to increase and is expected to reach approximately 1.1 terabits per month per household by 2010 in the U.S.. For comparison, 20 of these homes would generate more traffic than the entire Internet of 1995. However, the demand is not being met by increasing supply.

Giancarlo, Charles H. "The Internet accelerates while U.S. trails behind," [http://www.sfgate.com/cgi-bin/article.cgi?file=/chronicle/archive/2006/12/14/EDGOULJ5TB1.DTL?sid=BAC-spot3], December 2006.

U.S. only industrialized country lacking a comprehensive national broadband strategy

Almost every economically developed nation has a national telecommunications policy to promote broadband development – except for the U.S..

Keefe, Jeffrey. "Racing to the Bottom: How Antiquated Public Policy is Destroying the Best Jobs in Telecommunications," Economic Policy Institute, July 2005.

IX. INTERNET INNOVATION ALLIANCE CO-CHAIRMEN

Larry Irving is the President and CEO of the Irving Information Group, a consulting firm providing strategic advice and assistance to international telecommunications and technology companies, technology and media startups and foundations and non-profit organizations. Prior to founding the Irving Information Group, Mr. Irving served for almost seven years as Assistant Secretary of Commerce for Communications and Information and Administrator of the National Telecommunications and Information Administration (NTIA), where he was a principal advisor to the President, Vice President and Secretary of Commerce on domestic and international telecommunications and information technology issues.

During his tenure as Assistant Secretary, the focus of Mr. Irving's work was opening domestic and foreign telecommunications markets to competition, ensuring consumer choice, and spurring development of advanced telecommunications and information infrastructures in rural and under served areas. Mr. Irving was one of the principal architects and advocates of the Clinton Administration's telecommunications and Internet policies, and was a point person in the Clinton Administration's successful efforts to reform the United States' telecommunications laws. Those efforts resulted in passage of the Telecommunications Act of 1996, the most sweeping change in America's telecommunications laws in 60 years.

Similarly, in international fora, Irving was an ardent advocate of regulatory reform on behalf of the Clinton Administration. He represented the United States Government as "Sherpa" (lead coordinator for the U.S. Government) at the G-7's first Ministerial meeting on the Global Information Society in Brussels, and at the Information Society and Development Conference in South Africa, the first Ministerial meeting between developing countries and developed countries to discuss the Global Information Infrastructure. Mr. Irving was also a key member of the United States' team that negotiated the World Trade Organization (WTO) agreement on basic telecommunication services.

On behalf of the Clinton Administration, Mr. Irving led or participated in trade missions and global conferences in all corners of the world to promote principles of competition, liberalization, and privatization of telecommunications and information technology sectors. Mr. Irving also has been an ardent advocate of regulatory forbearance with regard to new information technologies, particularly the Internet, and helped establish domestic and international policies regarding the emerging Electronic Commerce marketplace.

Mr. Irving is widely credited with coining the term "the digital divide" and sparking global interest in the growing problem it represents. He initiated and was the principal author of the landmark Federal survey, Falling Through the Net, which tracked access to telecommunications and information technologies, including telephones, computers and the Internet, across racial, economic, and geographic lines. In large part due to his work to promote policies and develop programs to ensure access to advanced telecommunications and information technologies, Mr. Irving was named one of the fifty most influential persons in the "Year of the Internet" by Newsweek Magazine.

He received a Bachelor of Arts degree from Northwestern University in 1976, and is a recipient of the University's Alumni Merit Award for distinguished professional achievement. He is also a graduate of Stanford University School of Law, where he was President of the Class of 1979.

He is married to Leslie Annett Wiley and resides in the District of Columbia.

Bruce P. Mehlman is co-founder of Mehlman Vogel Castagnetti, Inc., a bipartisan public affairs consulting firm based in Washington, D.C. A technology industry leader for many years, Mehlman helps high tech players understand, anticipate and navigate the public policy environment and trends likely to impact the global marketplace. As Executive Director of the Technology CEO Council, the leading CEO-led information technology association, Mehlman works with leading CEOs to identify and promote public policies that encourage innovation leadership and tech-led economic growth. Mehlman works with other clients on a variety of issues including software, telecom and emerging technologies.

Mehlman previously served as Assistant Secretary of Commerce for Technology Policy (2001-2003). Nominated by President Bush and confirmed by the U.S. Senate, Assistant Secretary Mehlman led the Office of Technology Policy's efforts to maximize technology's contribution to U.S. economic growth and global competitiveness. At Commerce Mehlman worked closely with leaders from industry, federal labs, universities and governments on critical policy issues impacting technology creators and users including innovation policy, broadband, biotechnology, open source software, tech-led economic growth, technology transfer, nanotechnology and the IT workforce. Assistant Secretary Mehlman appeared before more than 200 audiences, from large national conferences of industry analysts to thought leaders at leading universities, from middle school students in computer classrooms to testimony before Congressional committees.

Prior to joining the Department of Commerce, Mehlman served as Telecommunications Policy Counsel for Cisco Systems, Inc. At Cisco, Mehlman worked with public policy leaders and technologists throughout the information technology community on issues of broadband deployment, wireless networking, e-commerce strategies and Internet policy. Before joining Cisco Systems, Mehlman served as Policy Director and General Counsel at the House Republican Conference, the House of Representatives' leadership office headed by Oklahoma Congressman J.C. Watts, Jr. Mehlman formerly served as General Counsel of the National Republican Congressional Committee under Chairmen Bill Paxon (NY) and John Linder (GA), advising Members of Congress and congressional candidates on election law, political broadcast regulations and ethics regulations. He also worked as a commercial litigation attorney in the Washington, D.C. law firm of Wiley, Rein & Fielding.

Bruce serves on the Board of One Economy Corporation, a non-profit devoted to universal broadband access and content, and the Advisory Boards of the NanoBusiness Alliance and the Princeton University Plasma Physics Lab. He is a term member of the Council on Foreign Relations and co-chairs the working group on Infrastructure & Environment as part of the Council on Competitiveness' National Innovation Initiative. Mehlman received his B.A. from Princeton University (cum laude) and his J.D. from the University of Virginia School of Law, where he served on the Virginia Law Review.

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