U.S. Innovation: Driving the 21st Century World Economy

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Cisco Systems U.S. Sales Meeting
Service Provider Segment

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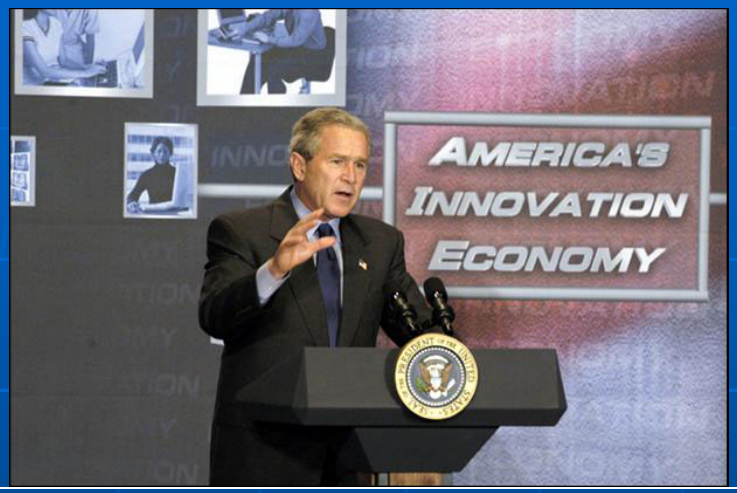
The President's Broadband Vision



President Bush speaking at the U.S. Department of Commerce June 24, 2004

"This country needs a national goal for broadband technology . . . universal, affordable access for broadband technology by 2007."

– President George W. Bush, Albuquerque, NM, March 26, 2004

Government's Role

"The role of government is not to create wealth; the role of our government is to create an environment in which the entrepreneur can flourish, in which minds can expand, in which technologies can reach new frontiers."

– President George W. Bush, Technology Agenda, November, 2002.

Benefits of Broadband

"The spread of broadband will not only help industry, it'll help the quality of life of our citizens."
— President George W. Bush, US Department of Commerce, June 24, 2004

- Tele-Medicine
- Distance Learning
- Tele-Work
- National Security
- Jobs and Economic Growth

Creating Economic Conditions For Broadband Deployment

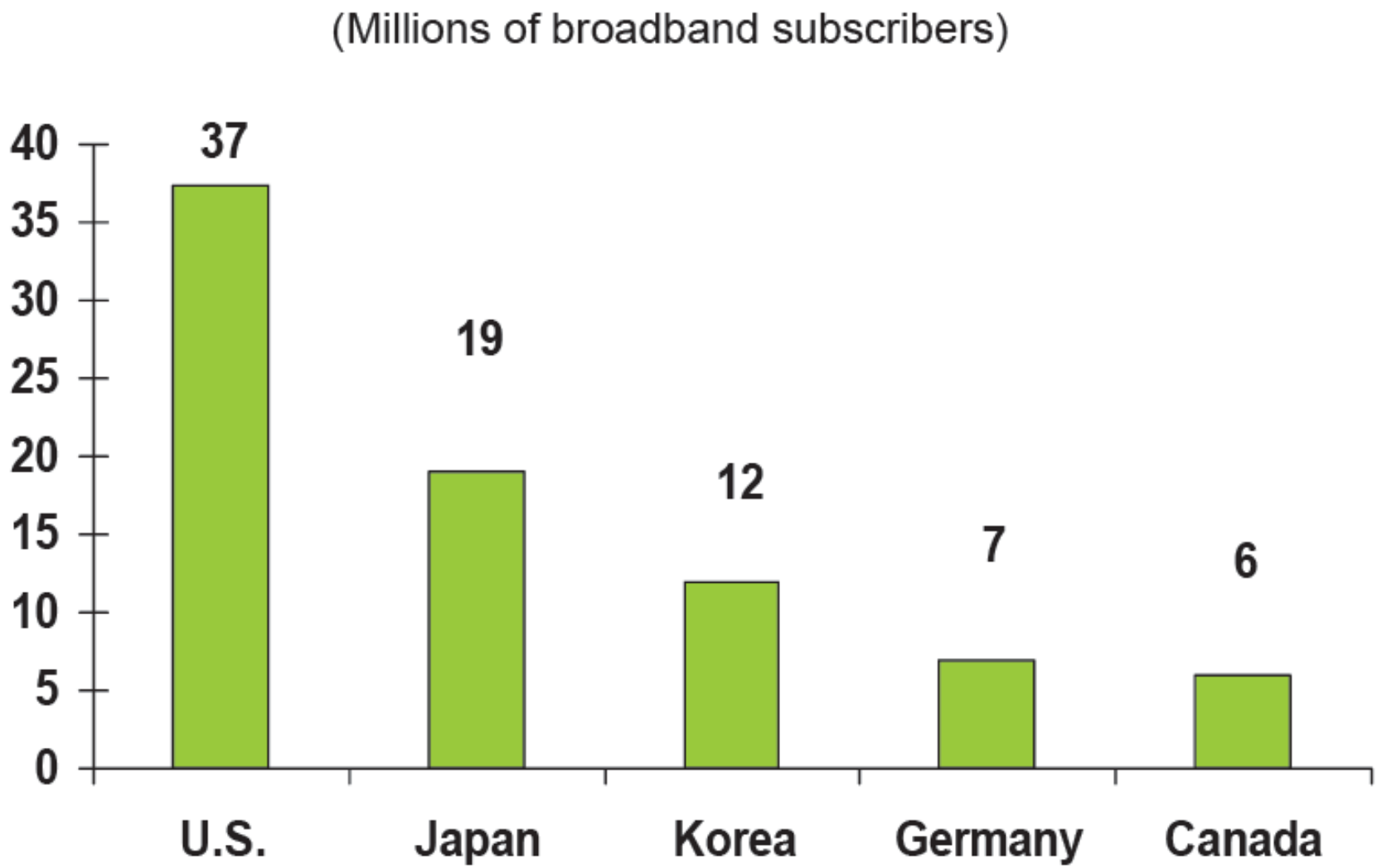
Tax relief has given businesses powerful incentives to invest in broadband technology:

- Accelerated depreciation for capital-intensive equipment.
- Extension of the Internet tax moratorium until Oct. 31, 2007; support making it permanent.
- An 18-month extension of the research and experimentation tax credit; support making it permanent.
- President's FY 2006 budget requests a record $132 billion for research and development.

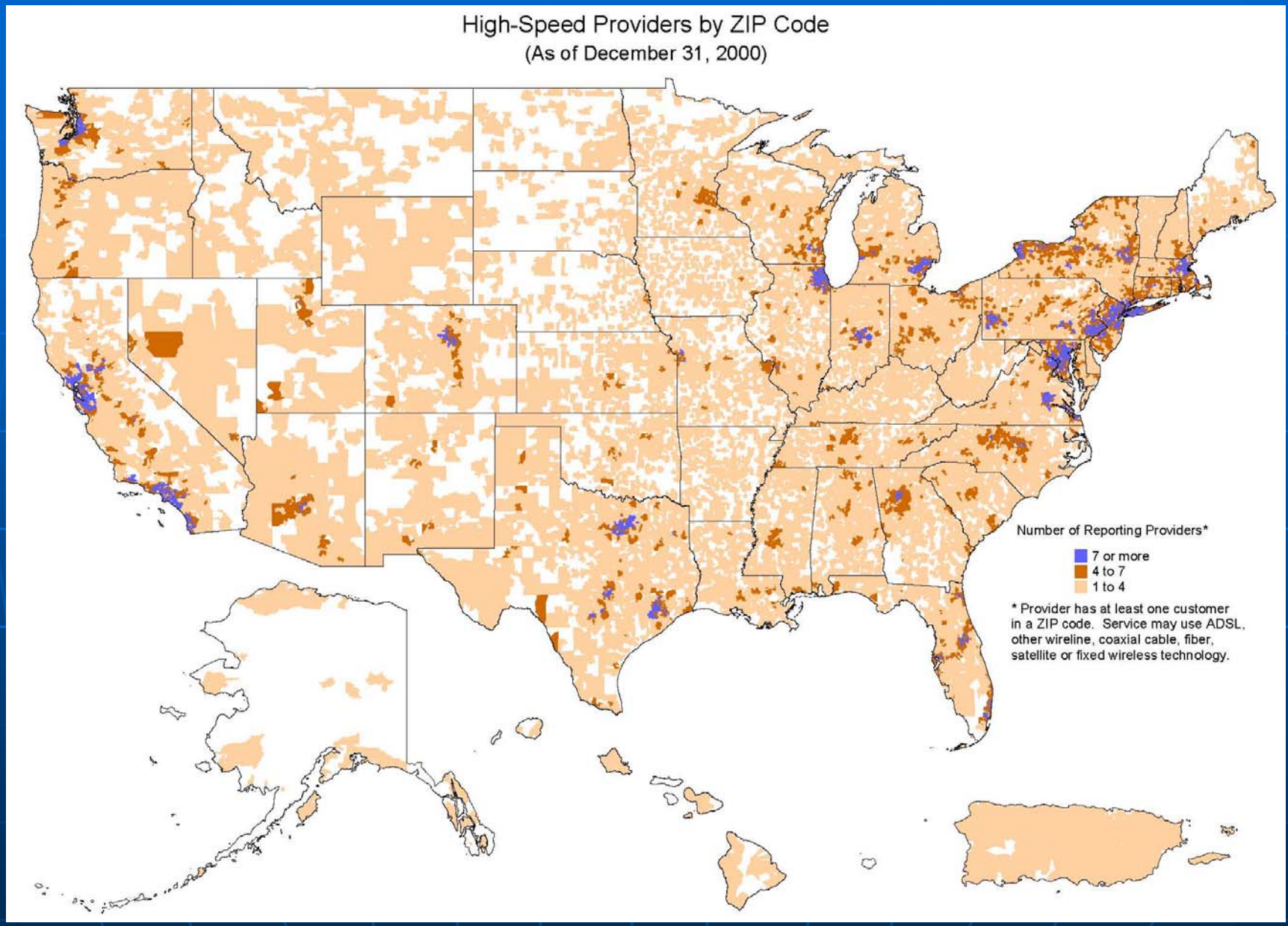
Reducing legacy regulation of broadband services:

- The Administration supports the FCC's order freeing newly deployed broadband infrastructure from legacy regulation.
- As a result – FOCUS, FTTH Council and TIA announced 5/10/05 that the number of communities with fiber build outs has increased 83% from 217 communities to 398 communities in 43 states. The number of homes passed by fiber grew from 970,000 in October '04 to 1.6 million in April '05.

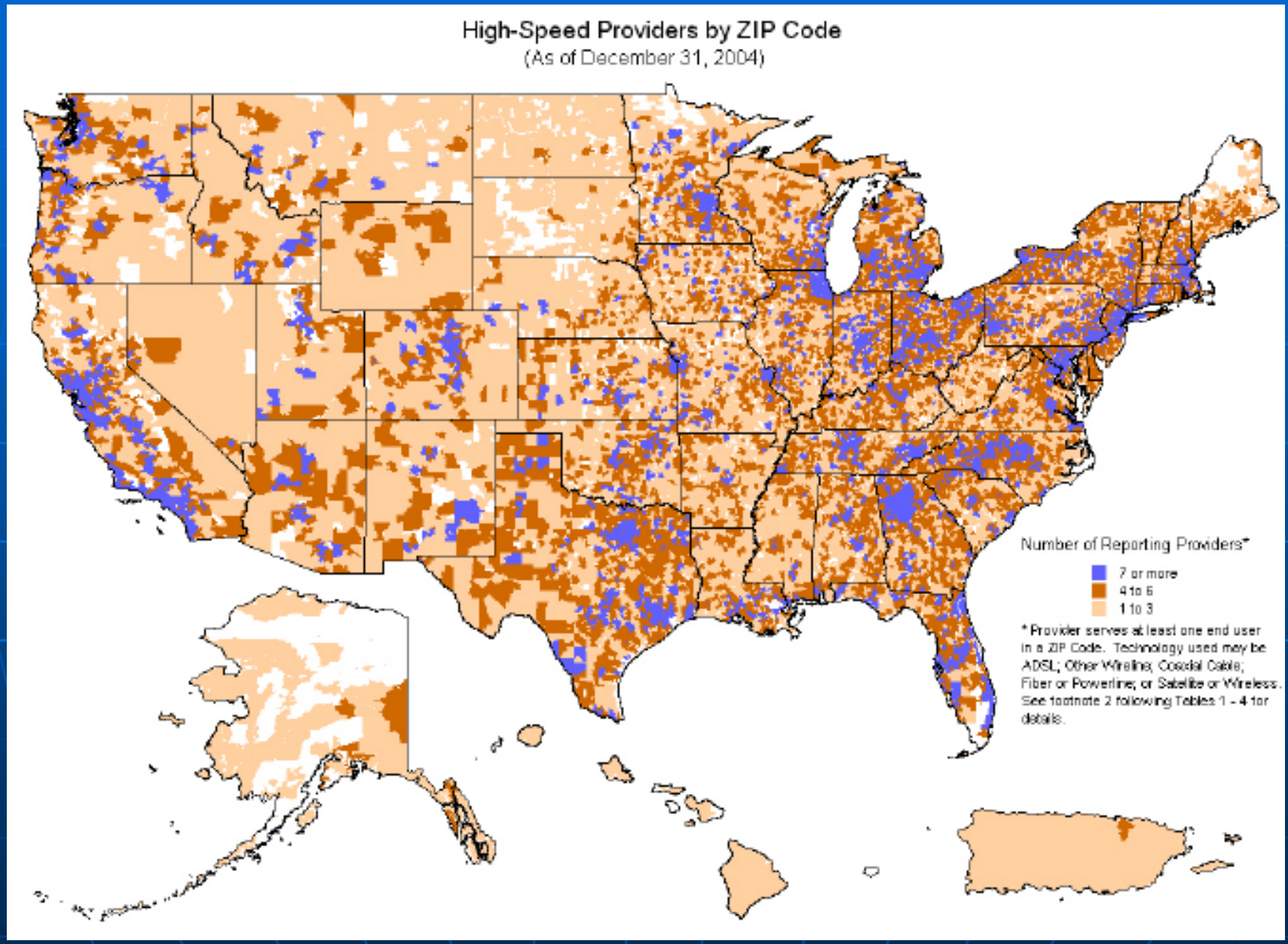
Largest Broadband Markets in the World



Source: OECD, December 2004

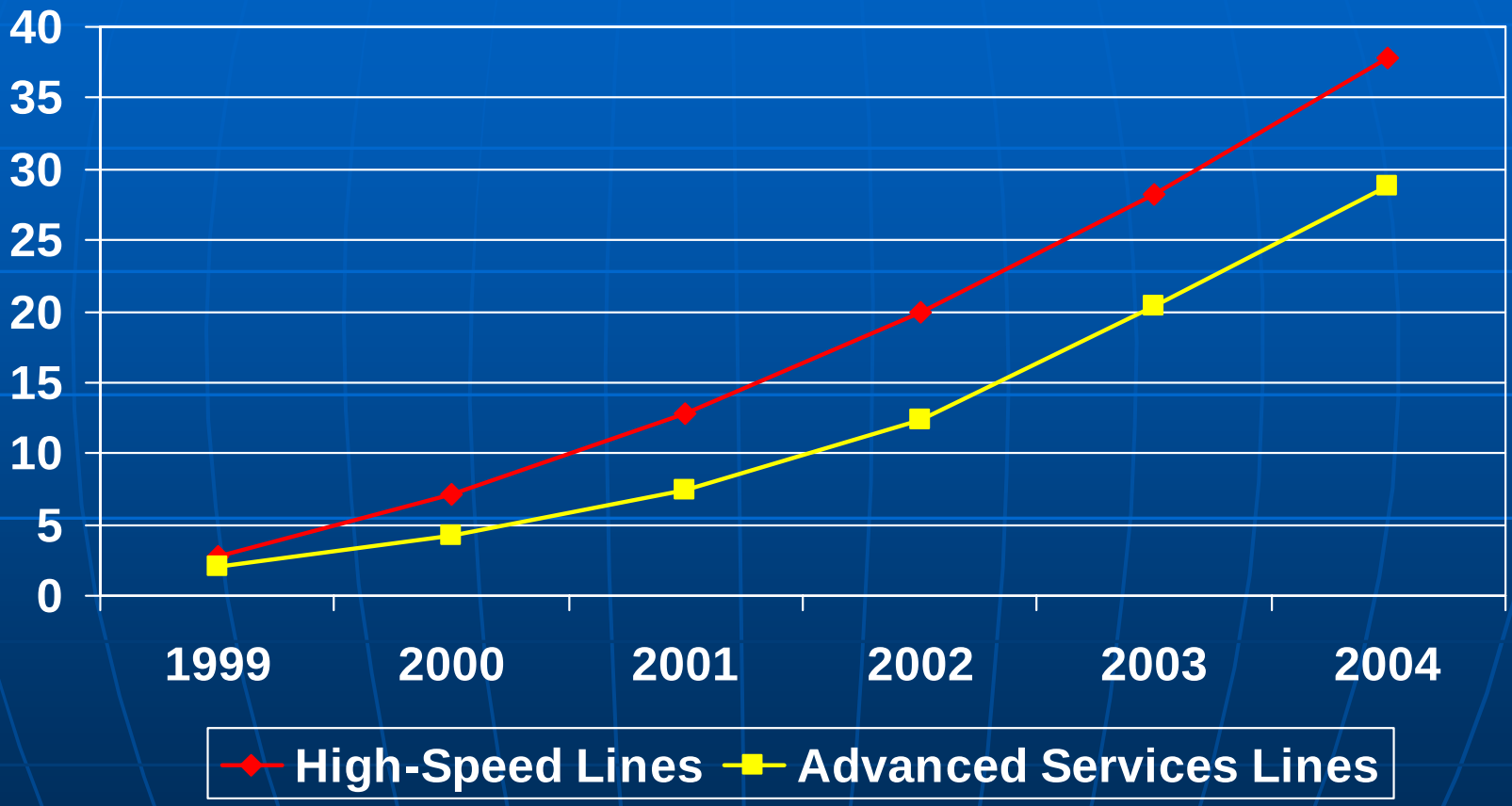

High-Speed Providers by ZIP Code
(As of December 31, 2000)
Number of Reporting Providers*
7 or more
4 to 7
1 to 4
* Provider has at least one customer in a ZIP code. Service may use ADSL, other wireline, coaxial cable, fiber, satellite or fixed wireless technology.

Source: FCC

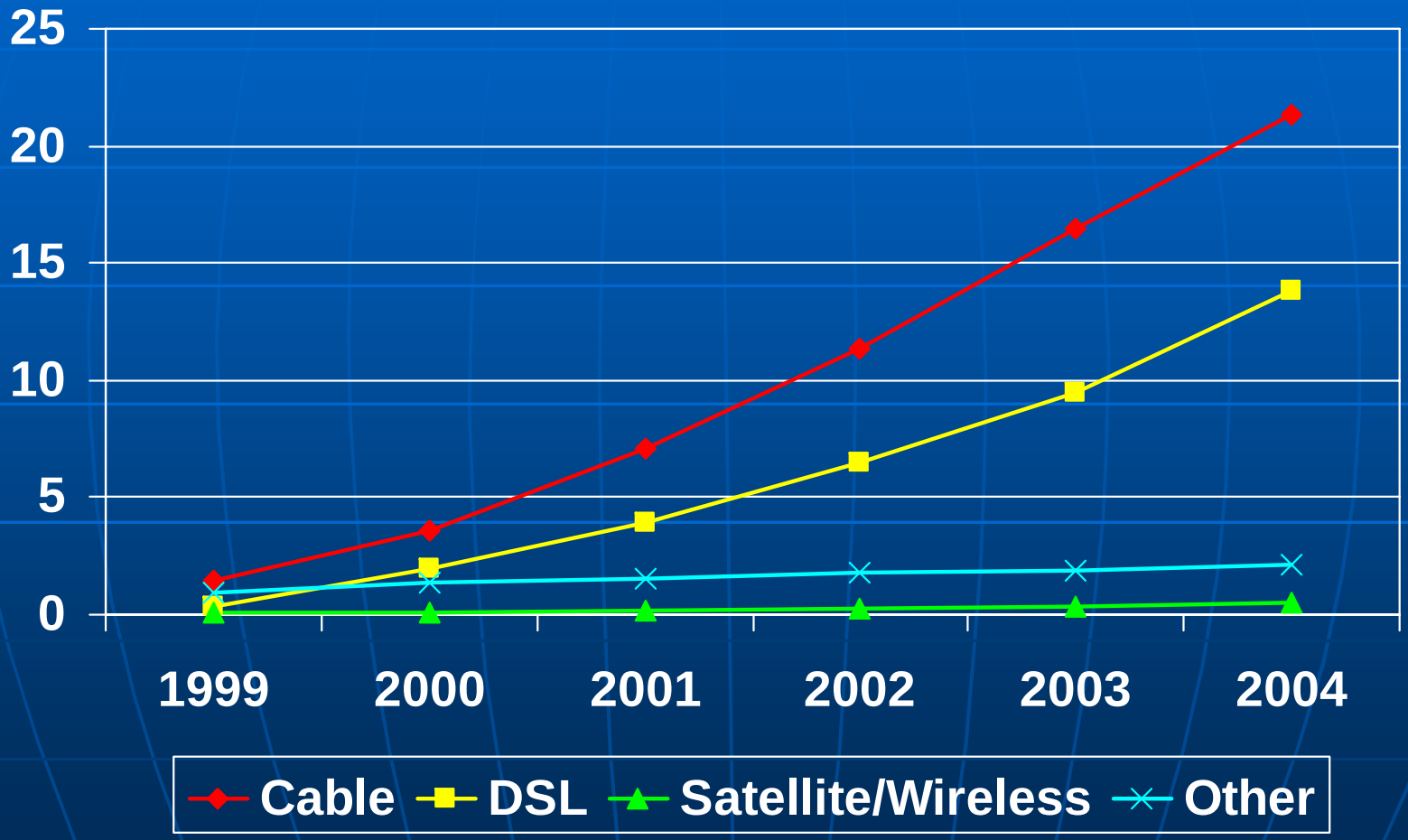

High-Speed Providers by ZIP Code
(As of December 31, 2004)
Number of Reporting Providers*
7 or more
4 to 6
1 to 3
* Provider serves at least one end user in a ZIP Code. Technology used may be ADSL; Other Wireline; Coaxial Cable; Fiber or Powerline; or Satellite or Wireless. See footnote 2 following Tables 1 - 4 for details.

Source: FCC

Growth in Broadband Lines 1999-2004



Types of Broadband Lines 1999-2004



Value – and Threats – Continue to Grow

Then...	Now
Domain Names **38.4 million** (Verisign, 2001)	**Domain Names** **82.9 million** (Verisign, 2Q05)
Average DNS Queries per Day - 3.3 billion (Verisign, 2001)	**Average DNS Queries per Day - 13.0 billion** (Verisign, 2005)
Average Emails per Day **15.8 billion** (IDC Market Analysis, 2001)	**Average Emails per Day** **31.8 billion** (IDC Market Analysis, 1Q05)
Average Virus/Malware Incidents per Day **2.0** (Verisign, 2001)	**Average Virus/Malware Incidents per Day** **4.0** (Verisign, 2005)
E-Commerce Revenue **$6.9 billion** (Census Bureau, 1Q01)	**E-Commerce Revenue** **$19.2 billion** (Census Bureau, 1Q05)

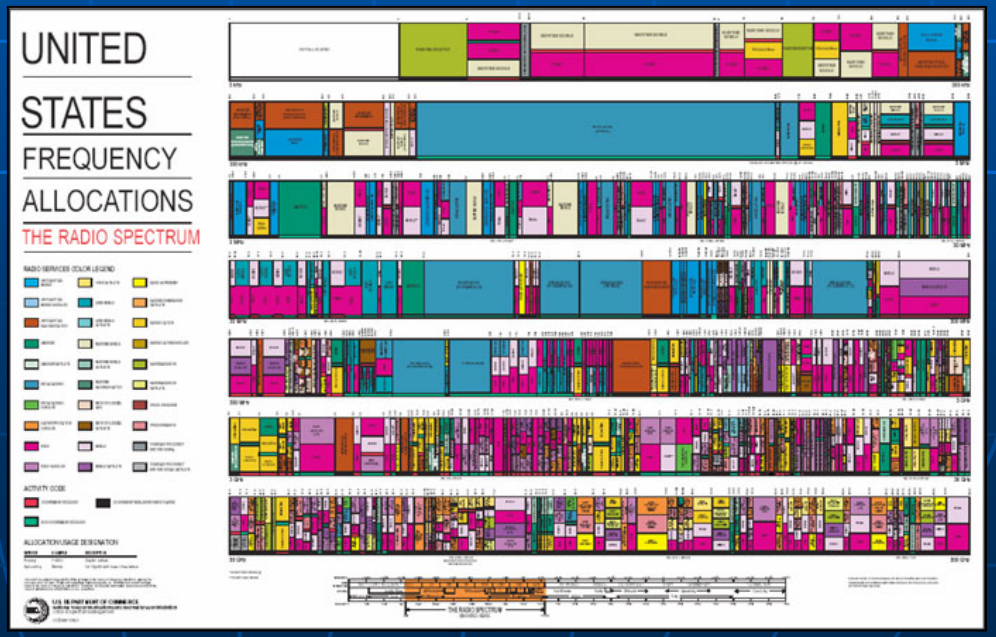
Moore meets Marconi: Wireless Broadband and New Technologies

"The other promising new broadband technology is wireless. The spectrum that allows for wireless technology is a limited resource . . . [a]nd a wise use of that spectrum is to help our economy grow, and help with the quality of life of our people."

-- President George W. Bush, June 24, 2004

The Administration has made more radio spectrum available for wireless broadband technologies:

- Advanced Wireless Services ("3G")
- Ultra-wideband
- 5 GHz Spectrum
- 70/80/90 GHz

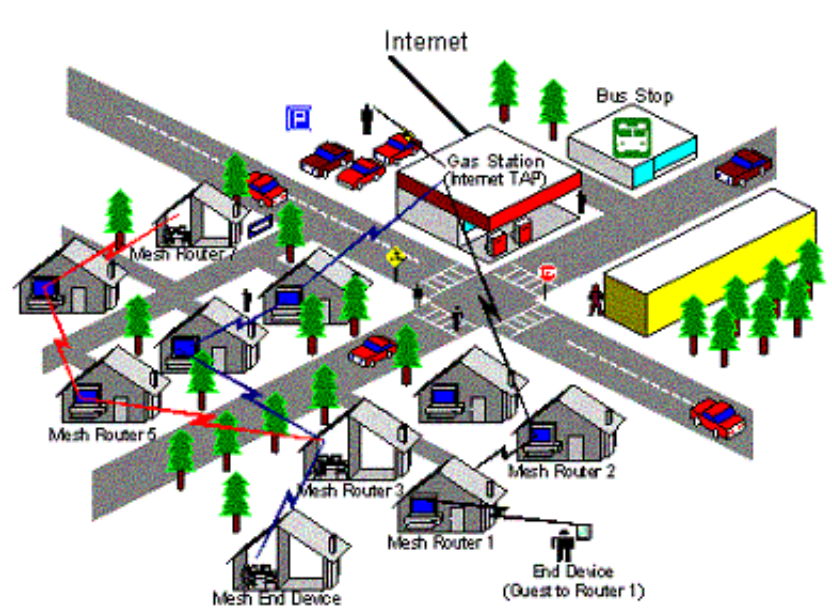


Expanding Competition: Wireless Applications of VoIP

- **Wi-Fi:** Until recently, the utility of Wi-Fi phones was limited to businesses and colleges. Companies such as Nokia, Flarion, IDT, Motorola, Cisco, and SpectraLink are beginning to develop hardware and software to facilitate Wi-Fi telephony.
- **WiMax:** Intel plans to build WiMax into its Centrino chip platforms, which power 80% of all PCs, by 2006. InStat/MDR estimates that a company could reach 97.2% of the US population with a $3.7 billion investment in Wi-Fi.
- **Software Defined Radio** (SDR) devices can dynamically reconfigure the device's characteristics for better performance and new services.
- **Cognitive radio technology** is a particular extension of SDR that employs model based reasoning based upon its assessment of the radio environment.
- **Smart antenna systems** provide numerous benefits in wireless communications environments.

Unlicensed Mesh Networking

- By linking nodes on an ad hoc basis, mesh technology promises to deliver high bandwidth at an order of magnitude lower cost than existing licensed wireless technologies.
- Mesh architecture permits the extension of wireless coverage to areas that do not have wire infrastructure, and can link diverse devices or networks.
- Mesh access points integrate with existing WLAN access points to extend wireless coverage to areas not readily accessible by cables.



Self-Organizing Neighborhood Wireless Mesh Networks
(Source: Microsoft Research)

"Big V" over IP: IPTV

- IPTV delivers streaming broadcast-quality video over the Internet. In consumer settings, IPTV can support video on demand (VoD), digital video recording (DVR), and interactive TV.
- Businesses can also use IPTV for video conferencing, employee training, or product training.
- IPTV will enable telephone companies to offer video services, as well as bundles of voice, data, and video services.
- Microsoft, Thompson/RCA, Juniper, Cisco, Minerva Systems, and Amino) are developing hardware and software to support IPTV.
- SBC and Verizon plan to invest over $8 billion on network upgrades to make IPTV available to more than 20 million homes over the next several years.
- Legislators in Congress and several states are considering bills to allow telephone companies to offer TV without having to negotiate franchise deals with cities.

Broadband Over Power Lines: The Third Wire

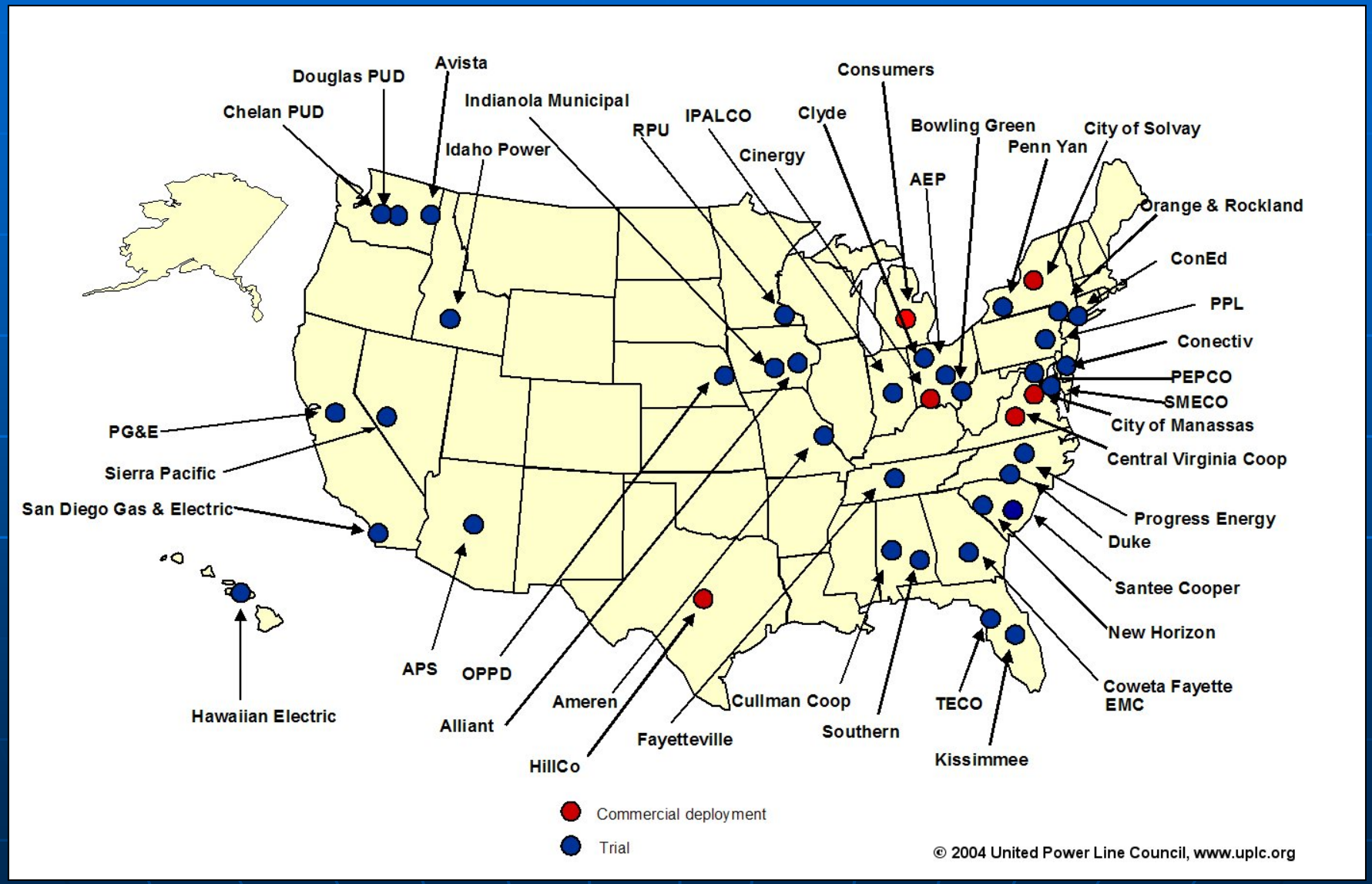
"We need to get broadband to more Americans . . . one great opportunity is to spread broadband throughout America via our power lines."

— President George W. Bush, US Department of Commerce, June 24, 2004

- The FCC began a BPL rulemaking on February 12, 2004.
- Principal concern was the risk that BPL systems might interfere with radio communications.
- NTIA submitted to the FCC a Phase 1 study that defined interference risks and potential mitigations (April 2004).
- Based on additional analyses, NTIA recommended several supplements to the FCC proposed BPL rules to reduce risk of BPL interference (June 2004)
- The FCC adopted rules incorporating most NTIA recommendations on October 14, 2004.
- Today, many utilities, hotel operators and others are deploying experimental and operational BPL systems.

HomePlug Modem can turn an electrical outlet into an Internet connection.

Broadband Over Power Lines: Current Deployments



Source: UPLC 2005

The Small Business Opportunity: Accelerating Americas Growth Engine

- The approximately 23 million small businesses in the U.S. represent half of all employment and create more than half of net new jobs. (U.S. Small Business Administration Office of Advocacy)
- In the six months ending December 2004, the number of high speed lines serving residential and business customers grew 25%, to over 26 million. (Federal Communications Commission)
- According to a poll by the National Federation of Small Businesses, 82% use the Internet, and of those, 58% have high-speed Internet. Yet of those without high speed Internet, only 19% do not have access to it, while 79% choose not to subscribe. (NFSB National Small Business Poll 2004.)
- The same poll found that only 7% of small business owners use VOIP. NTIA has developed a program strategy that over the next 5-10 years will result in the implementation of spectrum policy that satisfies the United States' requirements for using the spectrum domestically and globally.

ENUM: Seamless Movement between Telephone and Internet

- Electronic numbering (ENUM) protocol promises true convergence by facilitating communications through email, fax, instant messaging, or voice calls by using a single telephone number for all transmissions.
- The ENUM protocol was developed by the Internet Engineering Task Force; Global implementation will be administered by the International Telecommunication Union (ITU).
- NTIA has been supportive of industry efforts to bring about an ENUM trial.
- NTIA, in partnership with the FCC and State Department, is leading U.S. Government support of industry efforts to initiate an ENUM trial.

RFID and Wireless Sensors

- Estimated 10 billion RFID tags will be sold and in use by the end of 2005 (Source: Deloitte & Touche, 2005 Outlook for the Telecom Sector).
- Mega retailers Wal-Mart, Target, Marks & Spencer, Tesco, Metro AG, along with the Dept. of Defense have implemented RFID mandates.

- Implementation of RFID in the supply chain will result in reduced labor costs, greater inventory availability and efficiencies in management of the supply chain. For example, Deloitte & Touche projects Wal-Mart's cost savings at $1.3 billion annually (annual sales $256 billion).
- RFID is anticipated to increase sales by 3% from improved in-store stocks, reduce in-store labor expenses up to 65%, and reduce annual store and warehouse expenses by 7.5% (Precursor Analysis, 2004).
- Some current uses for RFID include: tracking airline baggage to reduce lost luggage, monitoring livestock, and beer kegs locators.

The Spectrum Challenge

A Presidential Policy Board examining spectrum management summed up the urgent issues in stating:

"The development of so valuable a resource as the radio spectrum is a matter of paramount importance. Despite technical and operational improvements the demand for frequencies has steadily crowded the supply within the usable spectrum. The use of this resource should have the most careful planning and administration within the United States and in cooperation with other countries. Unfortunately, guidance and administration have often been inadequate."

Cover story
July 23, 1990

President's Spectrum Policy Initiative

"The existing legal and policy framework for spectrum management has not kept pace with the dramatic changes in technology and spectrum use."

- President George W. Bush, Presidential Memorandum, May 29, 2003

Stated Purposes:

- To foster economic growth,
- Ensure national and homeland security,
- Maintain U.S. global leadership in communications technology development and services,
- Satisfy other vital U.S. needs such as public safety, scientific research, federal transportation infrastructure and law enforcement.

President's Spectrum Policy Initiative
Mission and Objectives

From the President's June 2003, Executive Memorandum:

A) Establish incentives for achieving improved efficiencies in spectrum use and for providing incumbent users more certainty of protection from unacceptable interference

B) Modernize and Improve the Spectrum Management System

C) Promote the timely implementation of new technologies and services while preserving national and homeland security, enabling public safety, and encouraging scientific research

D) Develop means to address the spectrum needs of critical governmental missions

President's Spectrum Policy Initiative Milestones

President's Executive Memorandum to Federal Departments and Agencies (June 2003)

-- Stated Need and Objectives

Two Reports from the Secretary of Commerce to the President (June 2004)

-- Recommendations of the Federal Government Spectrum Task Force

-- Recommendations from State and Local Governments and Private Sector Responders

Second Executive Memorandum (November 2004)

-- Adopted recommendations as policy

-- Assigned responsibilities and deadlines for implementation

Secretary of Commerce Implementation Plan

-- To implement those recommendations of the reports not expressly directed to other agencies and offices

Congress and the FCC: Looking Ahead

- Congressional Priorities
  - Digital TV Transition
  - Re-examination of the 1996 Telecom Act
  - Universal Service Reform
  - Intercarrier Compensation
  - Confirming new FCC Commissioners
- FCC Priorities
  - Digital TV Transition
  - Universal Service Reform
  - Merger Approvals
  - Media Ownership

U.S. Government's Views on Network Security

- Develop and promulgate standards applicable to federal government networks that vendors must meet.
- Encourage voluntary adherence to security standards by non-federal systems, e.g., networks and information systems used by private sector.
- Participate in domestic and international efforts to improve network security.
- Key messages from Commerce's July 2005 Wireless Security Forum:
  - Multi-layered security approach is necessary
  - Best practices and corporate/consumer education are important

NIST Role in Standards Development

- Implement Federal Information Systems Management Act (FISMA) of 2002
  - Develop *standards* for use by Federal agencies to categorize information systems -- FIPS (Federal Information Processing Standards Publication 199, issued February 10, 2004)
  - Issue *Guidelines* that help identify National Security Systems and map types information and information systems to security categories -- NIST SP (Special Publication) 800-59 and 800-60
  - Draft minimum information security *requirements* (management, operational, and technical security controls) -- FIPS 200
- Cooperate on Standards Development with Private Sectors (*e.g.*, ANSI-HSSP)
  - Co-chair programs designed to raise awareness and educate public re cooperative effort in developing standards.

Opportunities for International Trade and U.S. Job Growth

- Online retail sales has increased from $5.68 billion in 1Q of 2000 to $19.2 billion in 1Q of 2005 (U.S. Census Bureau).
- The number of international calling minutes in the U.S. has grown from 1.6 billion in 1980 to 43 billion in 2003 ("*Trends in the Telephone Service*," FCC, 6/05)
- Wireless broadband expansion married to VoIP creates great opportunity to reach vast markets in China, India, and other emerging markets.
- In 2002, mobile subscribers worldwide out-numbered fixed line telephone subscribers (ITU report, 6/03).
  - 1.43 billion GSM subscribers worldwide (GSM Ass'n 8/05).
  - Over 256 million CDMA subscribers worldwide (CDG 3/05).
- HSPDA, a faster version of 3G (WCDMA) is expected to reach the mass market in 2006 → launching first in the United States, followed by Japan, then Europe.
- CDMA2000 1xEV-DO Revision A – an enhanced version of CDMA2000 1xEV-DO that increases the efficiency, data speeds and capacity of existing EV-DO networks – will be commercially available in 2006.

Opportunities for International Trade and U.S. Job Growth (cont'd)

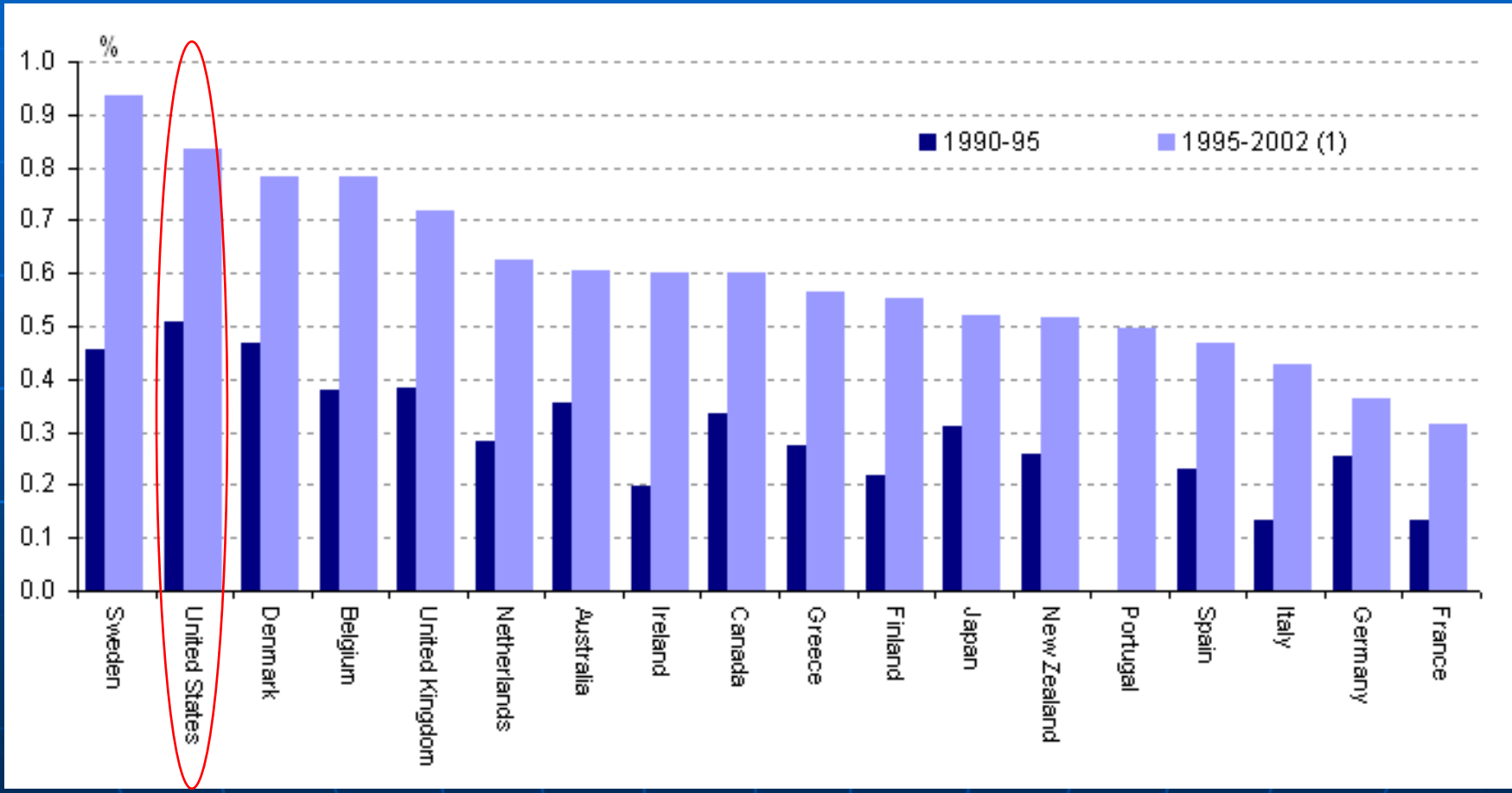
"In the last ten years, 3 billion people have joined the world economy."

- Craig Barrett, CEO Intel Corporation

- **India**
  - 1.08 billion people = world's largest democracy [1]
    200 million people = world's largest middle class [2]
  - Broadband and internet growth a priority -- Government of India has set a minimum goal of 20 million broadband subscribers and 40 million Internet subscribers by 2010.
- **China**
  - World's largest landline and mobile telecom networks -- China plans to inject $500 billion between 2001-2005 into its telecom infrastructure.
  - China's telecom equipment market, ($20 billion estimated worth) is among the world's largest. U.S. exports comprise only $630 million of that total, leaving ample room for expansion.
- **Russia**
  - Market for IP Telephony expected to reach $200 million in 2004.
  - Mobile penetration almost twice that of fixed-line telephony, and growing at 104% annually.

[1] The World Factbook 2005 (updated July 2005).
[2] "Tech's Future", *Business Week,* Sept. 27, 2004.

Contributions of ICT Investment to GDP Growth: International Comparisons



1. 1995-2002 for Australia, Canada, France, Germany, Japan, New Zealand and the United States, 1995-2001 for other countries.

Source: OECD Productivity Database, September 2004, [www.oecd.org/statistics/productivity]

Overarching Goal: Promoting Economic Growth

Thanks to the President's policies, America's economy is strong:

- GDP grew 3.4% in 2Q05 and 3.6% during the past 4 quarters, above the averages of the past 3 decades. During the past 4 quarters, EU25 GDP grew 1.3% and euro-zone GDP grew 1.2%.
- The economy has shown job growth for 26 straight months and added nearly 4 million new jobs since May 2003 – more than Canada, France, Germany, Great Britain, and Japan combined.
- Over the past four years, productivity grew at its fastest 4-year rate in over 50 years.
- 207,000 new jobs added in July – the U.S. unemployment rate is 5.0%, while the EU25 unemployment rate is 8.8%.
- Manufacturing activity (ISM index) has been growing for 26 straight months – the longest period of growth in 16 years.
- National homeownership is 68.2%, near its record high of 69.2% in 4Q2004.