

# UTC Telecom 2004

**“Achieving Economic Security and  
National Security”**

**Michael D. Gallagher**

**Acting Assistant Secretary**

**U.S. Department of Commerce**

**National Telecommunications and Information Administration**



[www.ntia.doc.gov](http://www.ntia.doc.gov)

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# Overarching Goal: Promoting Economic Growth

- Thanks to the President's policies, America is once again growing:
  - U.S. economy grew at 4.2% in the first quarter of 2004; economic growth in second half of 2003 was the fastest in nearly 20 years.
  - Tax relief has given businesses powerful incentives to invest in broadband technology:
    - Accelerated depreciation for capital-intensive equipment.
    - Extension of the Internet tax moratorium; support making the moratorium permanent.
    - Extension of the research and experimentation tax credit; support making it permanent.
  - Payroll employment increased by 288,000 in April, with 867,000 new jobs created so far this year. Over 1 million new jobs have been created since August 2003.
- The President will not be satisfied until every American who **wants a job** has a job.

# Universal, Affordable Access to Broadband by 2007

- Goal

*"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.

# Expanding Competition — Wireless Broadband and New Technologies

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

- **Advanced Wireless Services (“3G”)**
  - NTIA directed 90 new MHz of spectrum
- **Ultra-wideband (UWB)**
  - NTIA tested and analyzed UWB effects
  - Result - Devices operate in over 7 GHz of spectrum at power levels so low that it effectively underlays some of the most congested frequencies
- **5 GHz Spectrum**
  - Additional 255 MHz of spectrum made available for shared unlicensed use
  - Resolved a complex management issue that posed a potential barrier to the deployment of devices using 802.11(a) WiFi technology
- **70/80/90 GHz**
  - Web-based mechanism to coordinate of federal and non-federal operations
  - Non-federal users can determine potential frequency conflict with federal users in a matter of minutes

# Broadband Over Power Lines: Promoting Broadband Innovation

*“Broadband over power lines [BPL] holds promise to be the ‘Third Wire’ into American homes – a competitive, facilities-based, cost-effective new way to deliver high-speed Internet services to American citizens.”*

- NTIA Acting Assistant Secretary Michael Gallagher

- Principal concern is the risk that BPL systems might interfere with federal government radio communications or other state and private radio operators.
- FCC began BPL rulemaking on February 12, 2004.
- On April 27, 2004, NTIA published a report of Phase 1 research, measurement and analysis findings.
- Now NTIA is filing comments on the FCC’s proposed rules ...includes key analysis findings from Phase 2 study
- NTIA’s complete Phase 2 study report is targeted for release later this year.



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

# NTIA'S R&D is Showing How Radio and BPL can Co-exist

## Phase 1 Technical Study:

- Over 10 million measurements taken & analyzed.
- Over 800 BPL emission models assessed.
- Characterized federal use of 59,000 radio frequency assignments between 1.7 and 80 MHz.
- Special protections needed in 41 narrow frequency bands (5.4% of 1.7 - 80 MHz spectrum).
- Showed that interference risks are high under existing FCC Part 15 rules.
- Showed how risks can be reduced through refined compliance measurement procedures.
- Identified numerous other means for reducing risk and mitigating interference if it occurs.



BPL Measurement Site on Gallagher Drive in Whitehall, Pennsylvania

# NTIA'S On-going Studies Support Immediate BPL Rulemaking

- Key Phase 2 technical analyses have been completed and the findings are appended to NTIA's comments on proposed rules:
  - Ionospheric propagation and aggregation of Access BPL emissions is not a potential near-term problem.
  - Recommend adding a "height correction factor" of 5 dB to measurements made at 1 meter height ...estimates the peak field strength exceeded at 20% of heights along power lines:
    - Avoids varying measurement height (major time savings);
    - Statistical easement does not significantly affect interference risk and allows use of higher BPL power where and when needed.
  - Recommend measurement search for peak field strength all along the power line (10 meters away at 1 meter height)
- Studies of In-House BPL and Access BPL using low- and medium-voltage wiring provide a good basis for rulemaking.



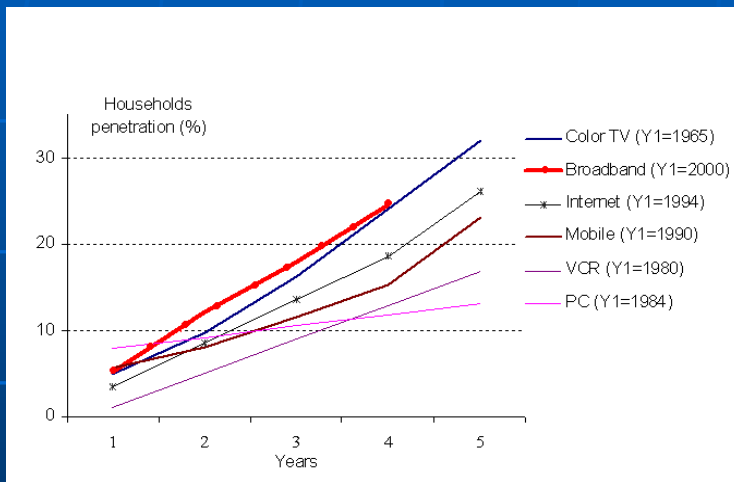
# NTIA'S Recommended Solutions Intend To Satisfy All Parties

- No change to BPL emission limits.
- Refine Access BPL measurement procedures to reduce risks.
- Fulfill special protection requirements by specifying minimal:
  - Coordination areas, wherein planned Access BPL deployment must be coordinated with a specified authority;
  - Excluded bands, wherein Access BPL emissions are prohibited;
  - Exclusion zones – areas in which specified frequencies may not be used for Access BPL.
- Voluntarily coordinate other radio operations to reduce risks -- enabled by advance notification of planned Access BPL deployments.
- Mandatory Access BPL power control, frequency agility and shut-off capabilities to reduce risks and expedite interference mitigation.
- Provisions requiring prompt response to complaints of suspected interference (recast FCC's shut-down requirement as a last resort)



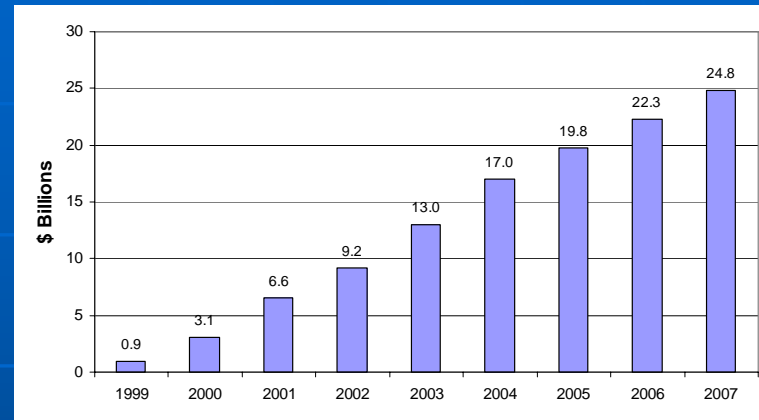
# Strong Growth in the Broadband Market

## Rate of Broadband's Diffusion



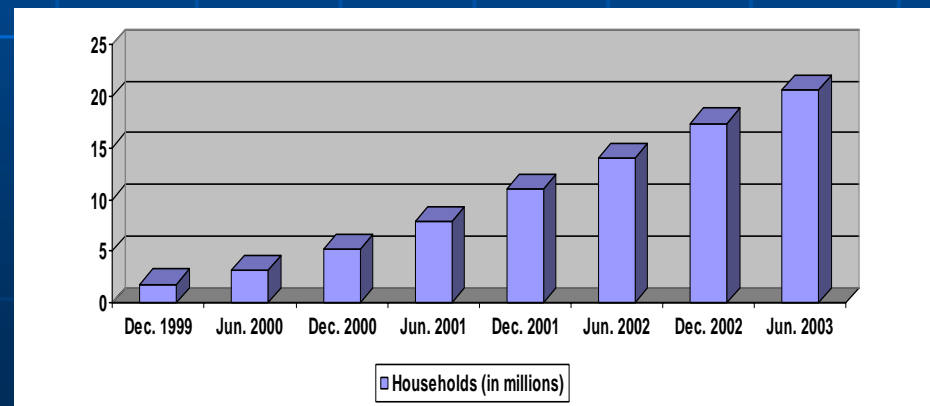
Source: OECD, 2003

## Broadband Revenues



Source: TIA's 2004 Telecommunications Market Review and Forecast

## Broadband Subscription



Source: FCC, Dec. 2003

# National Security: CIP Directives and Plans

- CIP Publications and Information Sharing
  - *National Strategy to Secure Cyberspace* (Feb. 2003)
  - Homeland Security Presidential Directive -7 (Dec. 2003)
  - National Infrastructure Protection Plan (currently underway)
  - National Cyber Alert System (Jan. 2004) [www.us-cert.gov](http://www.us-cert.gov)
- CIP Organizations
  - Department of Homeland Security
  - Homeland Security Council
  - National Infrastructure Advisory Council
- CIP Outreach
  - Domestic (DHS and DOC)
  - International (State Department)

# First Responder Interoperability Initiatives

- DHS has a number of First Responder Grant programs aimed at improving ability to deal with threats. (\$2.2 billion State Homeland Security Grant Program; \$725 million Urban Area Security Initiative)  
[www.grants.gov](http://www.grants.gov), [www.firstgov.gov](http://www.firstgov.gov)
- **SAFECOM Program** – Administration eGov initiative to coordinate communications interoperability among federal/state/local first responders. [www.pswn.gov](http://www.pswn.gov)
- **DOJ's High-Risk Metro Area Interoperability Assistance Project** – Top 25 Metro areas.
- **Wireless Priority Service (WPS)** – a service available only to designated individuals at all government levels: national security, emergency responders, and private sector critical infrastructure leaders and decision makers, as approved by Federal Communications Commission Rules and Requirements and the NCS. Plans are to bring its current WPS carrier (T-Mobile) to full operating capability this summer and to add other carriers to the program.  
[www.ncs.gov](http://www.ncs.gov)

# Public Safety Interoperability Standards

## ■ Project 25

- User-driven (Fed/State/local) digital interoperability standard with manufacturer participation through TIA.
- Provides for competition between manufacturers—user's choice.
- Voluntary standard adopted by many Federal Agencies, including: Justice, Treasury, DHS, DOD, Interior, DEA, FBI, FCC, NCS, NSA, Customs, Border Patrol, DISA, Secret Service, Park Police, INS, Forest Service and Fish and Wildlife Service.
- NTIA Public Safety Division and ITS involvement in standards development and test beds.
- More at [www.project25.org](http://www.project25.org)

## ■ Project MESA

- Joint US – EU standards development for broadband public safety applications. TIA and ETSI sponsored. User, manufacturer, service provider driven.
- Broadband ad-hoc wireless network to provide a wide range of services on scene.
- Statement of Requirements completed. Architecture development and technology definition has begun.
- NTIA Public Safety Division and ITS involvement in standards development.
- More at [www.projectmesa.org](http://www.projectmesa.org)

# Software Defined Radio (SDR)

- SDR can potentially solve problems facing the commercial wireless communication industry by easing the transition to new technologies
- Example – SDR-enabled devices can be dynamically programmed in software to reconfigure the device's characteristics for better performance, richer feature sets, advanced new services that provide choices to the end users and new revenue streams for the service provider
- SDR has the potential to alleviate interoperability problems facing federal, state, and local public safety organizations, and spectrum access and deployment problems faced by the military
- Current projects involved in the development of SDR include Department of Defense's Joint Tactical Radio System (JTRS)
- Security issues need to be resolved before SDR technology can be fully accepted for commercial and public safety applications

# Cognitive Radio

- Cognitive radio technology is a particular extension of SDR that employs model based reasoning based upon its assessment of the radio environment.
- NTIA is addressing the following issues raised in the FCC's Notice of Proposed Rulemaking on SDR and CR:
  - Ways CR can facilitate opportunistic use of the spectrum by unlicensed devices while protecting incumbent licensed spectrum users;
  - Rules for CRs permitting additional flexibility for unlicensed devices operating in rural and underserved areas;
  - How CR can enhance interoperability between different public safety entities;
  - Changes to the FCC's equipment authorization processes to better accommodate SDR and CR systems.

# Smart Antenna Technology

- Smart antenna systems provide numerous benefits in wireless communications environments:
  - Reduce multipath fading
  - Increase system capacity
  - Extending battery life of terminals
  - Extending the range of base stations
  - Interference reduction
- Systems employing advanced antenna designs such as sectorized and phased array adaptive antennas are now being used as part of wide area network systems.
- Sectorized and phased array antennas are used to create dynamic communication links with associated mobile and fixed devices in any direction around an antenna structure.
- The FCC has issued a rulemaking (et docket no. 03-201) to address compliance measurement issues related to sectorized and phased array antenna systems.



# Summary

- The President's policies are working to promote economic growth.
- Prepare, Plan, and Share Best Practices. Our BPL study of more than 10 million signal samples shows that solutions exist to all identified BPL technical issues.
- Redundant systems and networks, that yield appropriate priority access, are key to making sure that first responders have the resources they need to handle emergency situations.
- The Administration's efforts to promote a policy and regulatory environment for broadband technologies will allow everyone in our great nation to realize the benefits of broadband by 2007.