

# Measuring Broadband's Economic Impact\*

Sharon E. Gillett, Dr. William Lehr, Carlos Osorio  
Massachusetts Institute of Technology  
Communications Futures Program (CFP)

Prof. Marvin Sirbu  
Carnegie Mellon University  
Engineering and Public Policy

September 2005

*\* Research supported by the Economic Development Administration of the U.S. Department of Commerce, with matching funds provided by MIT CFP industry sponsors*

# Communications Futures (CFP) in a Nutshell

## CFP VISION

- Define roadmap for communications and the industries that depend on it
- Develop cross-cutting partnerships between industry and university
- Focus on destabilizing shifts of intelligence and control between network owners and users

## WORKING GROUPS

- **Broadband**
- **FTTX, jointly with CIPS**
- Core-Edge (Business) Dynamics
- Internet Architecture (QoS, D-DOS, Routing)
- Security and Privacy
- Viral Networking

## UNIVERSITY PARTNERS

- MIT CSAIL (David Clark)
- MIT CTPID (Sharon Gillett, Bill Lehr)
- MIT Media Lab (Andy Lippman, David Reed)
- MIT Sloan School of Mgmt (Charlie Fine)
- Cambridge and UCL (Jon Crowcroft, Mark Handley, Ian White, Richard Penty, Alwyn Seeds)

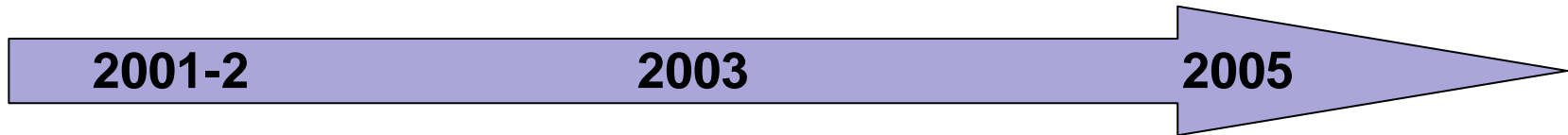
## INDUSTRY PARTNERS

- British Telecom      Motorola
- Cisco                      Nokia
- Comcast                  Nortel
- Deutsche Telekom      Samsung
- France Telecom          T-Mobile
- Intel

For further information: <http://cfp.mit.edu> or email Deborah Widener, [dw@media.mit.edu](mailto:dw@media.mit.edu)

# Progression of BB Impact Studies

---



- **1G: Prospective, hypothetical**
- **Crandall & Jackson (Verizon): BB to add \$500b to GDP by 2006**
- **Pociask (New Millenium Research Council): BB to create 1.2m jobs**
- **Ferguson (Brookings): Lack of BB to lower productivity growth by 1% annually**
- **2G: Case studies, individual communities**
- **Kelley: Cedar Falls, Iowa (muni bb since 1997) improved vs. neighboring Waterloo**
- **Strategic Networks: S. Dundas, Ontario (muni fiber since 2000) grew sales, jobs, tax revenues**
- **3G: Controlled, statistical, larger geographic scope**
- **Ford & Koutsky (Applied Economic Studies): Retail sales grew in Lake County, Florida (muni bb since 2001) vs. 10 control counties**
- **This study: U.S. national scope, compares 2002 economic indicators by zip code, based on FCC report of BB availability by 1999**

# Key Findings

---

- **National data supports the conclusion that broadband positively affects economic activity**
  - Even after controlling for community-level factors known to influence BB availability and economic outcomes
  - Controls: urban, income, education, growth in previous period
- **Communities where mass-market BB was available by December 1999 experienced more rapid growth by 2002 in:**
  - Jobs (employment)
  - Number of businesses (overall)
  - Businesses in IT-intensive sectors
- **Property values higher in 2000 where BB available by 1999**
  - Higher market rates for rental housing in 2000
  - Rents reported more accurately than home values in Census data

# Estimated Magnitude of Impacts

---

<b>Economic Indicator</b>	<b>Results (zip code comparison)</b>
<b>Employment (Jobs)</b>	<b>BB added about 1% to growth rate 1998-2002</b>
<b>Wages</b>	<b>No statistically measurable impact observed by 2002</b>
<b>Housing Rents (Proxy for Property Values)</b>	<b>More than 6% higher in 2000 where BB available by 1999</b>
<b>Business Establishments (Proxy for Number of Firms)</b>	<b>BB added nearly 0.5% to growth rate 1998-2002</b>
<b>Industry Mix</b>	<b>BB added over 0.5% to share of establishments in IT-intensive sectors, 1998-2002</b>  <b>BB reduced share of small establishments by about 1%, 1998-2002</b>

# The Usual Academic Qualifiers

---

- **Impacts larger than we expected**

- Upcoming peer review of methodology
- Are some controls missing?
  - If so, results could just be telling us that BB went first to communities already growing faster for other reasons
- We tested “matched sample” regressions to address this. Direction of impacts stays same, but statistical significance declines because of limited sample.

- **Penetration better metric than availability?**


- In most cases, BB has to get used to have economic impact
- FCC only collects lines in use at state level
- We tested statewide penetration as BB metric. Found state level to be too large a geographic aggregate to produce meaningful results: often more variation within states than across them.

- **Data limitations**

- Early BB availability / penetration variations lost by 1999 / 2000 (1<sup>st</sup> FCC data collections)
- 2000 Census data too soon to see impacts from 1999 availability (other than rent)
  - Wish list: self-employment, work-at-home, share of white-collar jobs, public assistance

# More Info and Paper Available...

---

- <http://cfp.mit.edu>  **Broadband Working Group**
- **Personal Broadband**
  - Architectures for seamless user experience
  - Enable opportunities for non-traditional (and traditional) providers
- **Broadband Incentive Problem**
  - Usage is not free
  - Need more nuanced approach to pricing, if BB is to follow Moore's Law
- **Reaching me**
  - [sharoneg@mit.edu](mailto:sharoneg@mit.edu); +1-617-253-2373
- **Thank you!**