



Bringing Home the Bits

CSTB's Broadband Report



About CSTB

“A pioneer in framing and analyzing Internet policy, CSTB provides independent assessments of technical and public policy issues relating to computing and communications.”

- Established in 1986 through the **National Research Council**.
 - Provides independent analysis to the United States Government.
- National Research Council is the “primary working arm” of the **National Academy of Sciences**, National Academy of Engineering, and the Institute of Medicine.
 - National Academy established by Congress in 1863, signed into existence by President Abraham Lincoln.
- See, <http://www4.nationalacademies.org/cpsma/cstb.nsf>

Getting to the Book



- Expert, multidisciplinary committee
- Numerous outside inputs + deliberations
- Multiple stake-holder perspectives
- Late 1999-Fall 2001
 - Ups and downs, changing world
 - Cf. CSTB's 1996 *The Unpredictable Certainty*
- Realpolitik? Consensus from a 'sadder but wiser' group that wants more broadband

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B. A Brief History Of Telecom Regulation

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Introduction

- Broadband is many things to/for many people
 - Many technologies, industries, uses, --disruptive technology
 - Incumbents, consumers, market observers, social visionaries, communications techs visionaries, computer industry
- Broadband is dynamic, no single winner expected
 - Cable & DSL dominate...but fiber & wireless growing
 - Walled Gardens and Public Commons coexist today



Introduction

- Many tensions/conundrums--something's broken?
 - Deployment glass is half-empty or half-full?
 - New businesses and lines of business have sprung up--and many businesses have failed or changed plans
 - Policy favors (presumes?) competition...but it's elusive
 - Broadband tied to the Internet/computing—but no Moore's Law
 - Walled Gardens and Public Commons coexist today



Location, Location, Location

*Number of providers will be location specific,
and may change in either direction over time.*

- Type 0—no provider... (but satellite ubiquitous)
- Type 1—one terrestrial facilities-based provider
- Type 2—two terrestrial facilities-based providers
- Type 3—one or more facilities-based providers install new infrastructure to compete with the incumbents



Progress Through Pragmatism

- Prioritize widespread deployment in early phases
 - Some broadband now > “competitive or bust”
 - Need more broadband to break chicken-egg cycle
- Learn demand & tech/market shapes--not presuppose
 - Monitor: distribution/performance variations, rates, market power
 - Stimulate development of alternative content, services, applications
 - Invest in training and support of users



Progress Through Pragmatism

- Universality/access important--but early overemphasis risks unintended consequences (chill or suboptimize investment)
 - Defer comprehensive pursuit in context of other actions
 - Again: priority on goal of getting substantially > 8%



Focus on Ends > Means I

- Technology neutrality?
- Aim for more facilities-based providers
 - Long-term preference over unbundling
 - Ensuring adequate spectrum
 - Shift distribution toward Type 3 where can
- Long-term, prefer 'logical-layer' to physical unbundling for new investment
 - Cable open access v. copper for DSL



Focus on Ends > Means II

- Focus regulatory expectations on the service rather than the technology (e.g., “reliable” telephony)
- Make framework coherent
 - Compare to current “stovepipes.” where related industries regulated differently.
 - Industry-technology-service binding presumed by policy doesn’t work as networks converge and fiber moves closer to customer through many paths



Locals Should Lead

- Broadband policy has been federal . . . but local variation and benefits call for bigger local roles
 - Area types: 0, 1, 2, more facilities-based providers
 - Promote distribution shift—toward more providers, but recognize potential for shift to fewer providers.
 - Help localities help themselves . . .



Locals Can Lead

- Public initiatives can foster market entry
 - Lower cost and/or risk; don't chill competition
 - Provide conduits, condominiums (avoid industry capture)
- Familiar tools can be used, esp. in high-cost and under-served areas
 - Relax local rules that may discourage investment.
 - Provide financial incentives?
 - Not urging proliferation of conflicting local rules



Locals Can Lead

- Increase local capacity
 - Planning grants? Cost-sharing (e.g., field trials)?
 - Clearinghouse of information and practices?

Transcend/Combat Assumptions



- **R&D on access technologies--esp. needs of nonincumbents and areas lacking stable private investment**
 - Architectural options and other means of cost-reduction in fiber access networks
 - Enhanced wireless capabilities
 - Technologies that foster the accommodation of multiple competitive service providers over intentionally open facilities
 - Quality of service for homogeneous and heterogeneous access scenarios

Transcend/Combat Assumptions



- **Research on economic, social, and regulatory factors**
 - Alternative business models and better understanding of consumer behavior
 - Economic and regulatory barriers to non-incumbent facilities providers
 - How to regulate/manage type 1 areas and avoid shifts to the left
 - Explore international comparisons
- **R&D on alternative content and services**

In Sum:

Prioritize Pushing Supply

- **From vision talk to action: promote deployment**
 - Bet that availability will stimulate demand, willingness to pay, and thereby entry
- **Keep the eyes open: monitor, move as needed**
 - Combine data and analysis with advocates' pressures
 - Be vigilant about market power abuses w/o presuming
- **Leverage learning to reframe universal service**
 - BB supply and user needs less uniform than telephony
- **Build better on grass roots**



Broadband: Bringing Home the Bits

- For information on how to order:
WWW.NAP.EDU (National Academy Press)
- For information about CSTB and this project:
WWW.CSTB.ORG