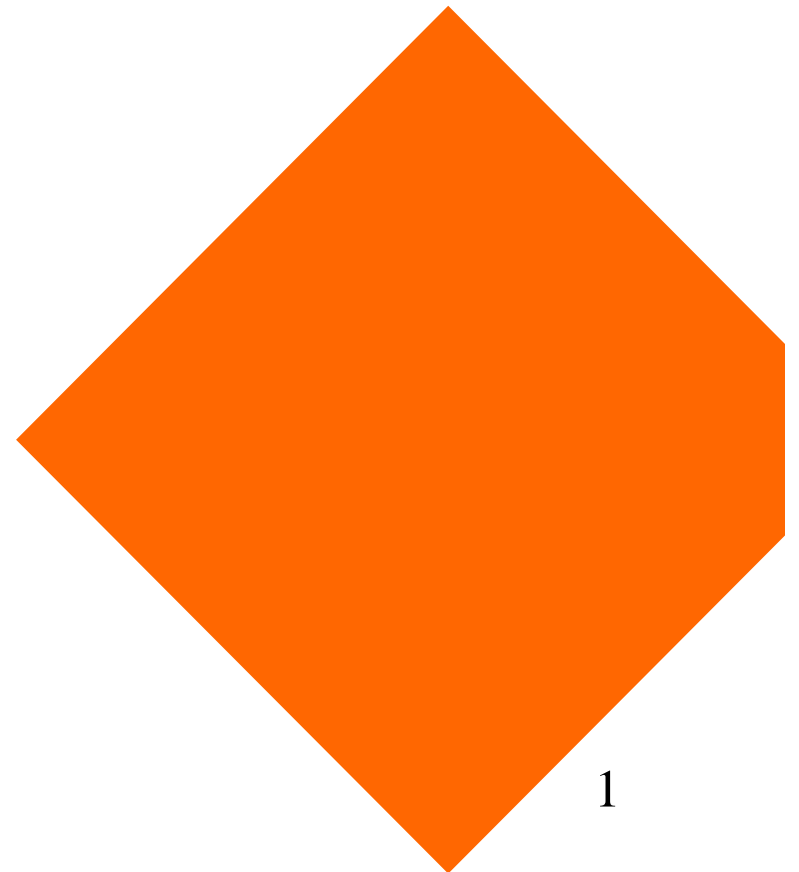


Broadband in America

Eli M. Noam

Columbia Business School

© Eli M. Noam, November 2003



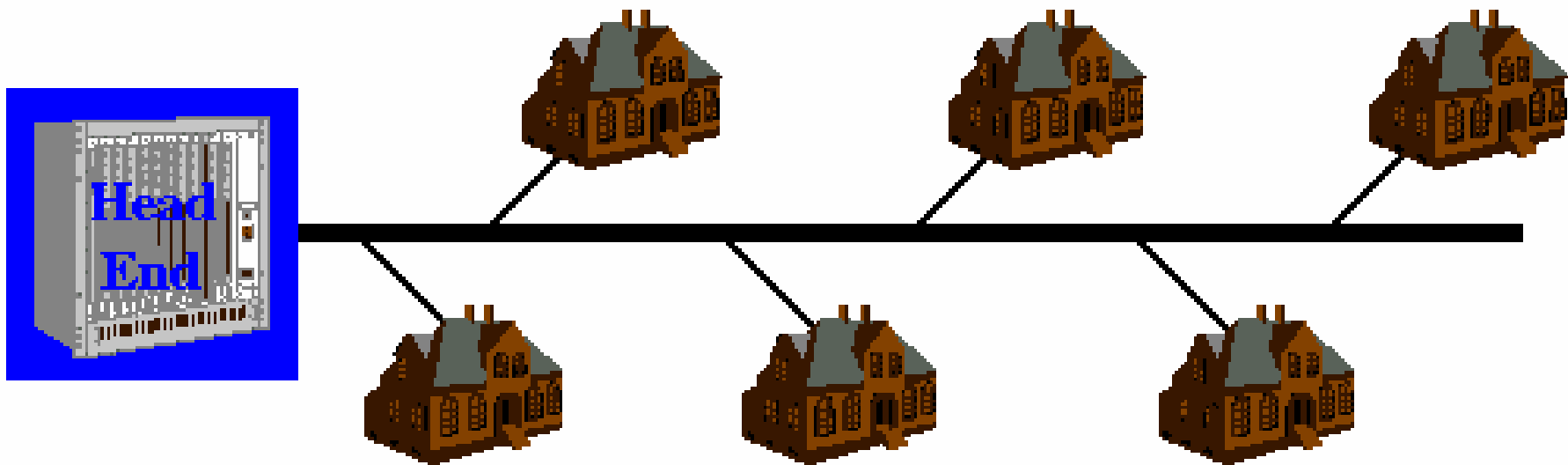
Presentation Outline

1. State of broadband in America
2. Implications of American broadband for other countries

Broadband: the Context

- In the past we created transmission networks of 2 types:
 1. Networks that moved a lot of bits shared by many: fat party line—cable TV

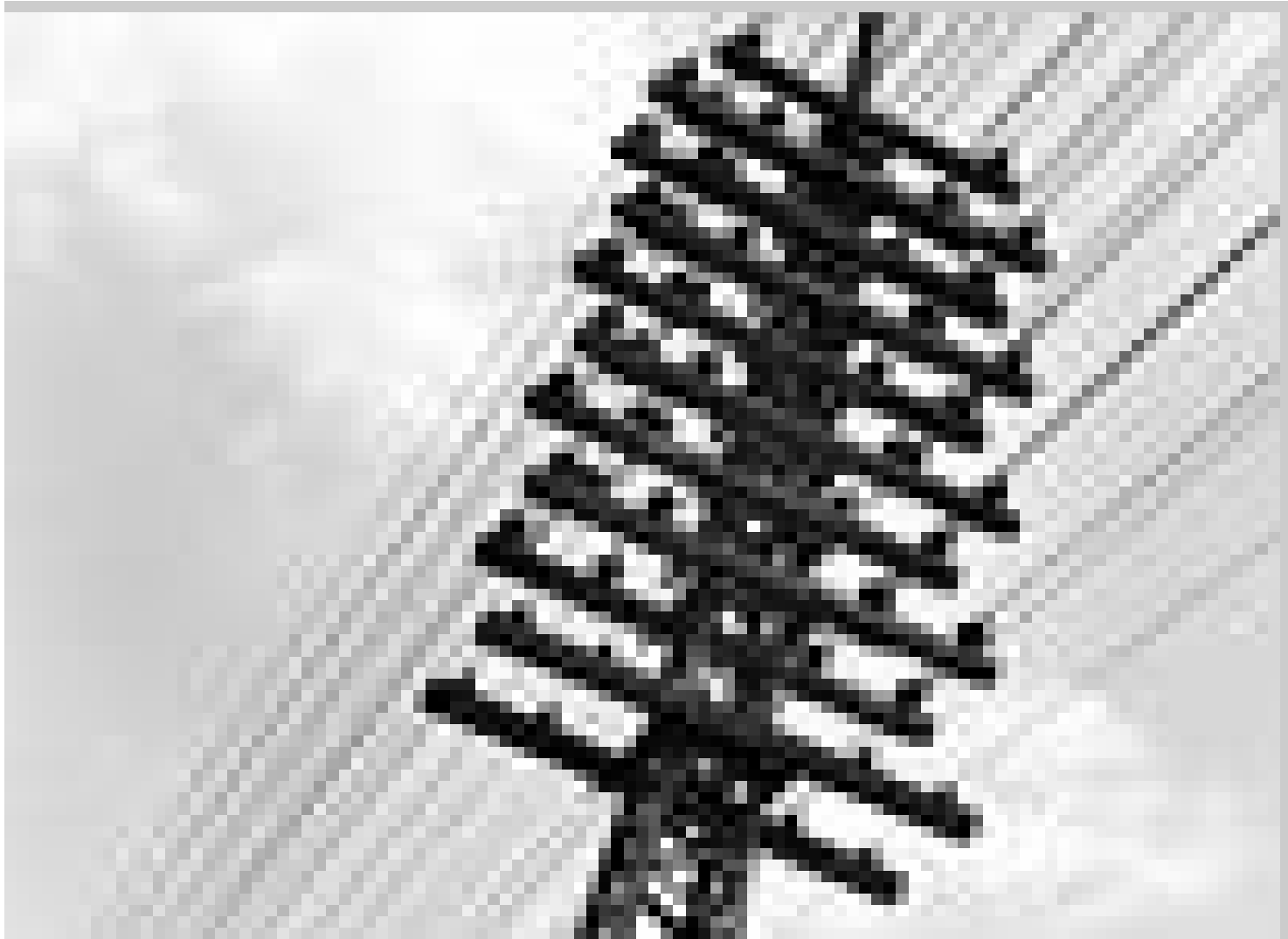
Fat Shared Pipes



<http://www.classic-cable.com/howworks.html>

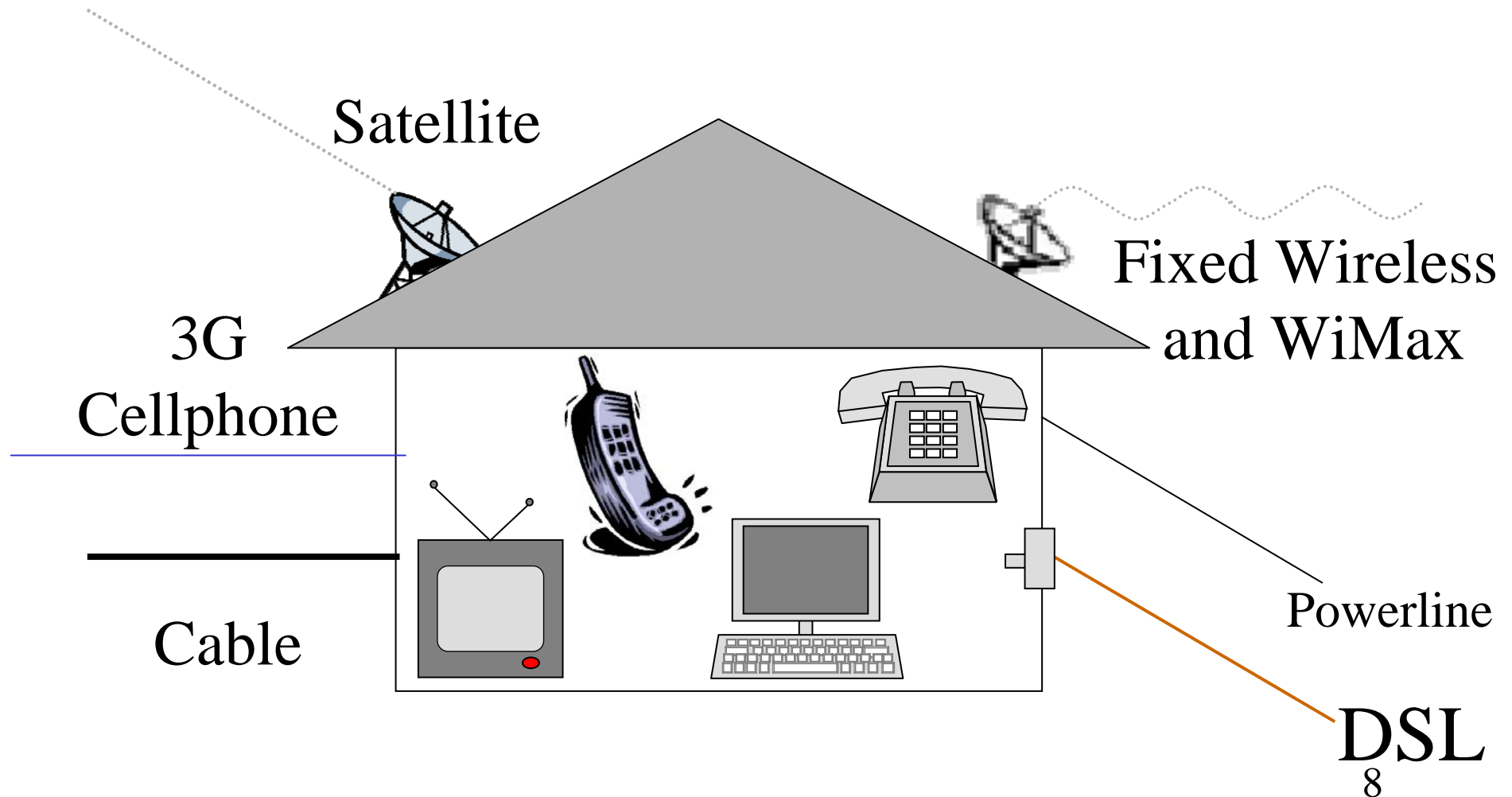
2. Networks that moved a relatively small number of bits, on an individualized basis—skinny individual lines--telephony

Skinny Individual Pipes



- But now we are in the midst of a historical move
 - From the kilobit stage of individualized communications to
 - the megabit stage
 - and within the reasonable future to the gigabit stage

Broadband in America



Good News: As of end of Q2 2003

- ~18% of US households subscribe to DSL or cable modems
- ~ 27% of Internet homes
- ~35% of IN usage hours

Subscribers mil (2Q 03)

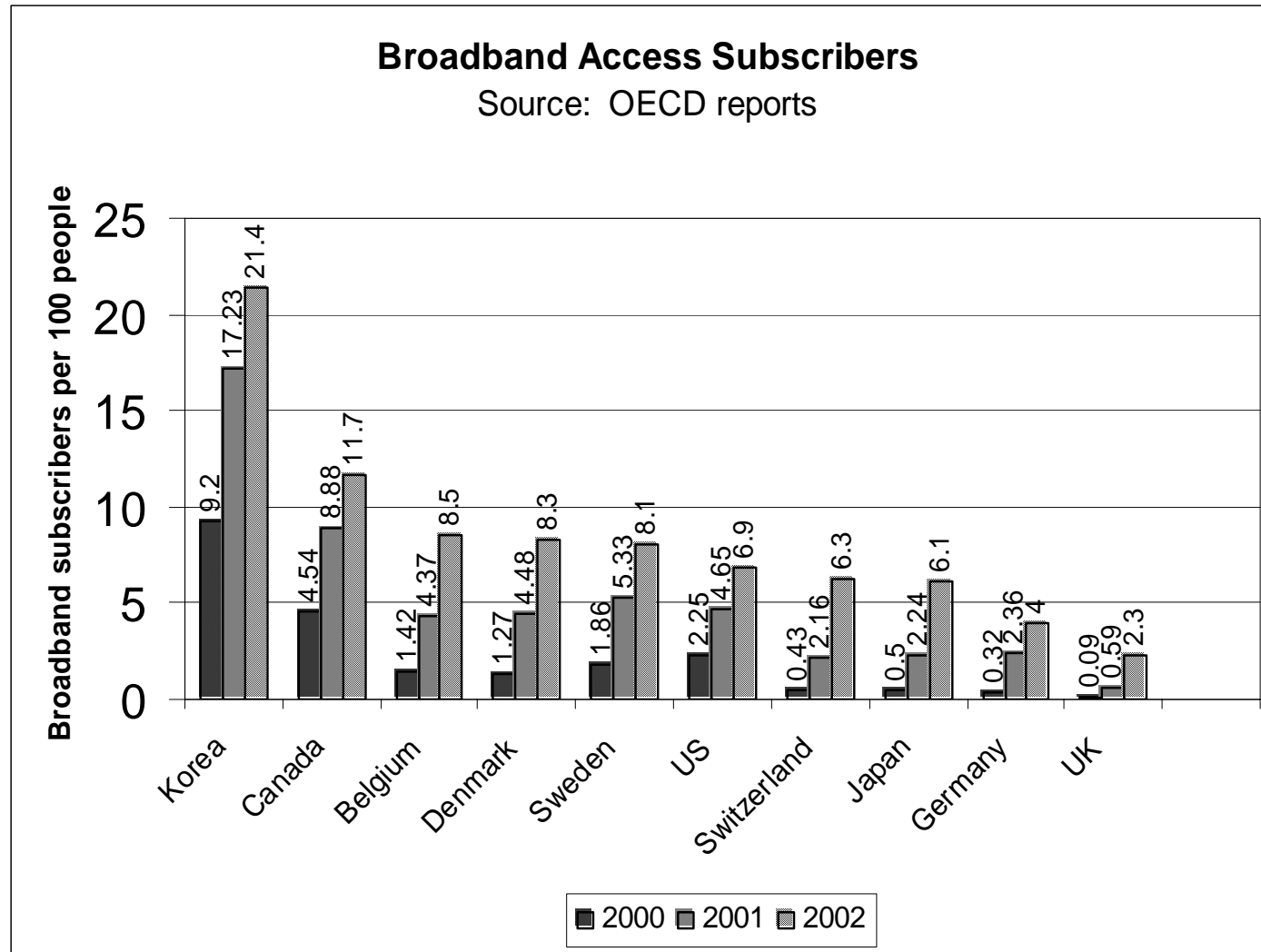
Satellite	0.2	
WiMax	0	
PowerLine	0	
FTTH	0.4	
DSL	8.6	
Cable Modem	12.4	
Total BB	21.3	(27%)
Dial-up	57.3	(73%)

Source: Telecommunications Reports Online Census, August 2003

High-Speed Lines by Type of Provider as of December 31, 2002
(Over 200 kbps in at Least One Direction)

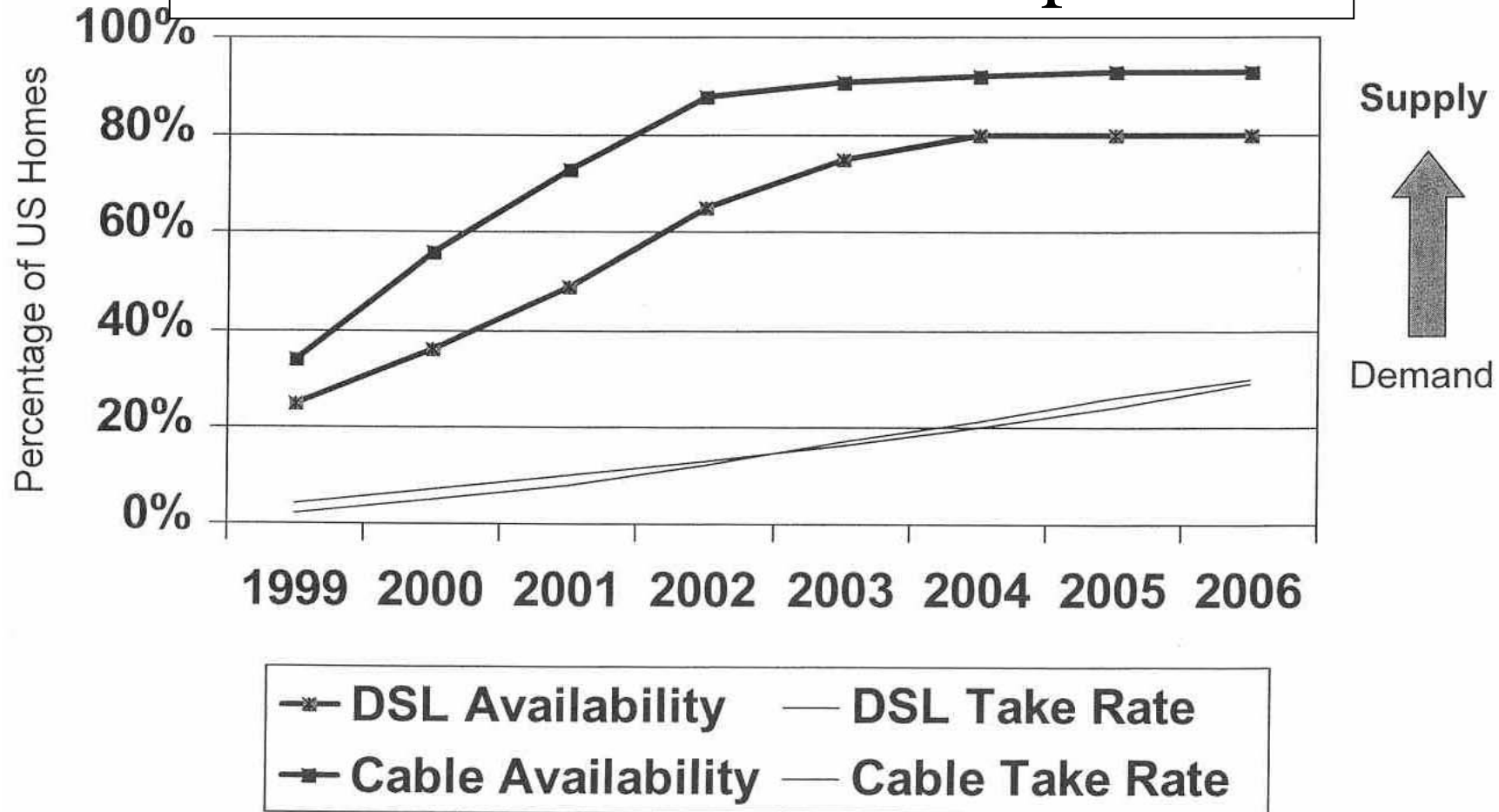
Types of Technology ¹	Lines				Percent of Lines		
	RBOC ²	Other ILEC	Non-ILEC ³	Total	RBOC ²	Other ILEC	Non-ILEC ³
ADSL	5,584,776	572,078	314,862	6,471,716	86.3 %	8.8 %	4.9 %
Other Wireline	756,120	144,108	315,980	1,216,208	62.2	11.8	26.0
Coaxial Cable	*	*	11,349,035	11,369,087	*	*	99.8
Other	*	*	761,434	824,538	*	*	92.3
Total Lines	6,401,996	738,242	12,741,311	19,881,549	32.2 %	3.7 %	64.1 %

But: US is not BB Leader



A Staff Report of the Office of Strategic Planning and Policy Analysis and International Bureau of the FCC, "Broadband Internet Access in OECD Countries:12 A Comparative Analysis", October 2003

US Problem is not a Supply Lag But a Demand Gap



Source: Morgan Stanley Dean Witter, July 2001

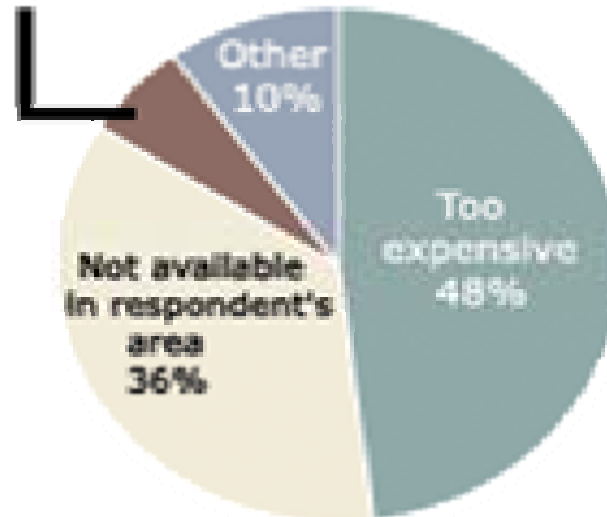
Reasons for Lagging Demand

- Price
- Applications

Price and Availability

**DIAL-UP DIEHARDS
SAY PRICE IS
THE PROBLEM¹**

**Lack confidence in
broadband ISPs 6%**



Average Costs

DSL : \$50

Cable BB: \$45

¹Reasons for not adopting broadband cited by 2138 respondents to *PC World's* Broadband ISP survey. IDC counted about 37.5 million U.S. dial-up users in 2001. Their reasons for keeping dial-up illustrate broadband's lingering weaknesses.

Country 100 kbit/s as % of
monthly income

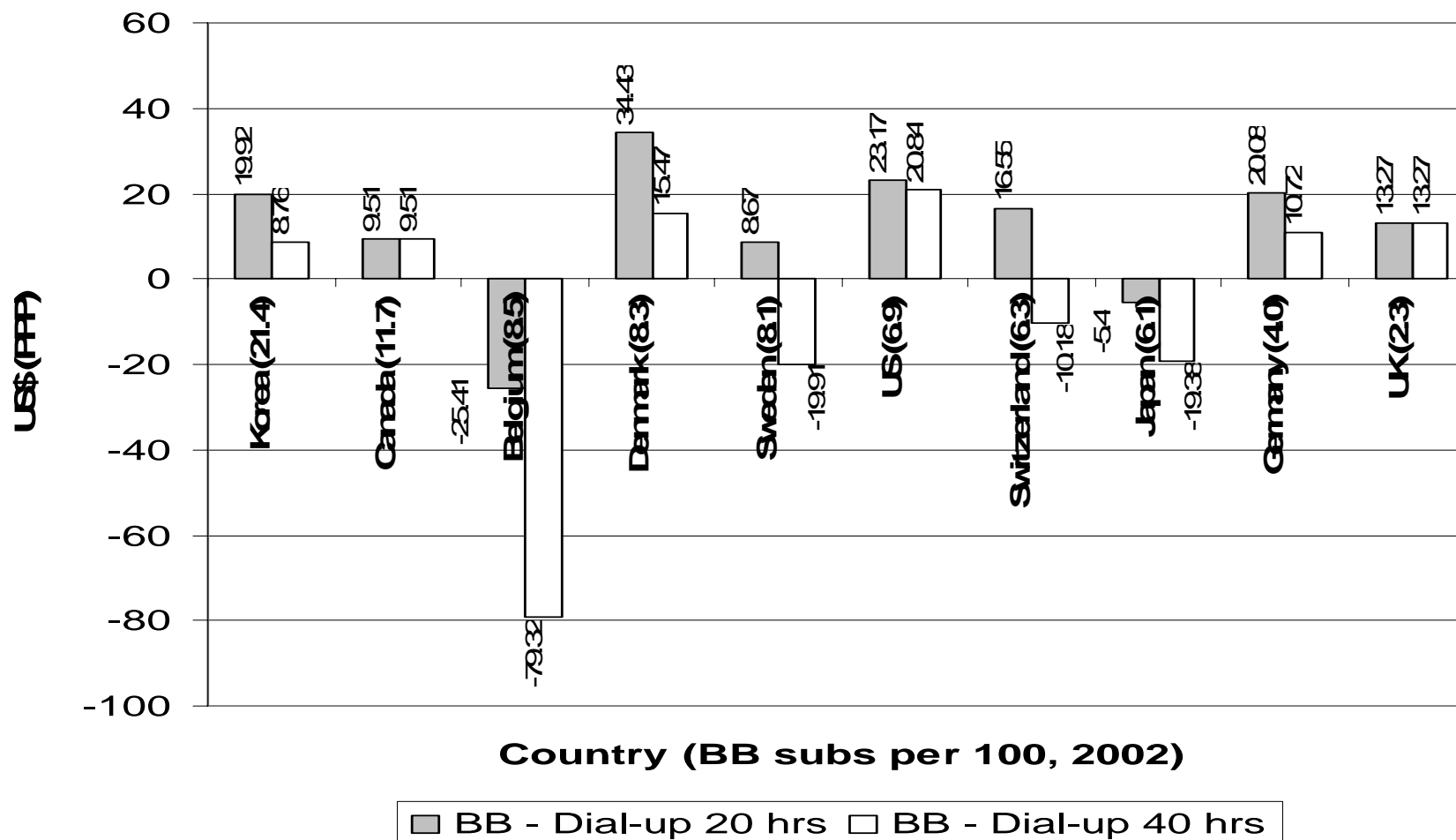
Japan	<0.01
Korea	0.02
Belgium	0.05
Hong Kong, China	0.06
Singapore	0.11
United States	0.12
Canada	0.14
Netherlands	0.15
Germany	0.2
Israel	0.25
Italy	0.29
United Kingdom	0.3
Sweden	0.43
Switzerland	0.43
France	0.46
Finland	1.09
Brazil	1.52
Mexico	3.95
Saudi Arabia	12.26

Relative Prices: BB vs NB

Dial-up (2002) vs. Broadband (2003) Prices

Highest to Lowest BB Subscribership, Left to Right

Source: OECD



Cable Modem Elasticity

Price	Demand Elasticity
\$20	-0.53
\$30	-0.59
\$40	-0.75
\$50	-0.98
\$60	-2.25
\$70	-3.34

Demand Elasticities

–Rappoport, Taylor, Kridel

•Cable Mod -0.75 to -0.98

•DSL -1.17 to -1.76

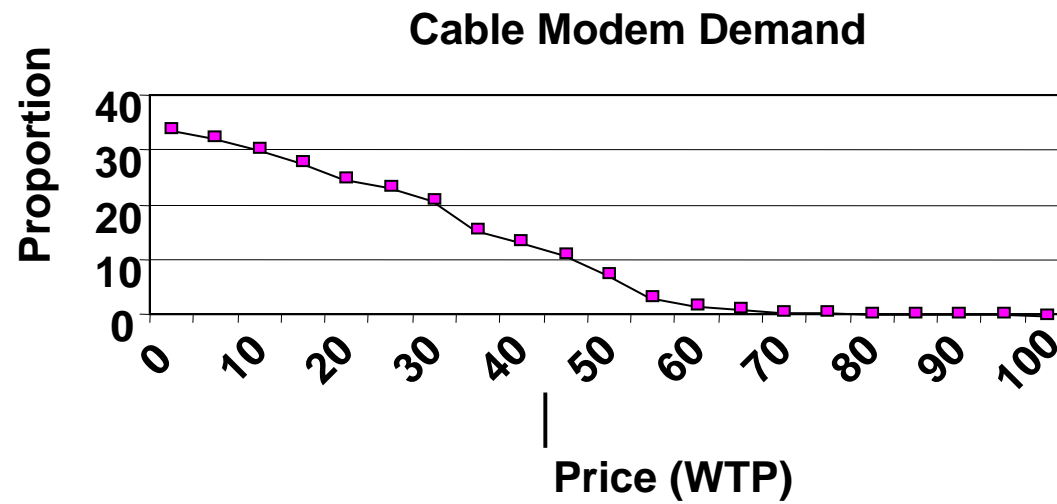
–Greater price elasticity for DSL

–Less ability of DSL to maintain high prices

Implications:

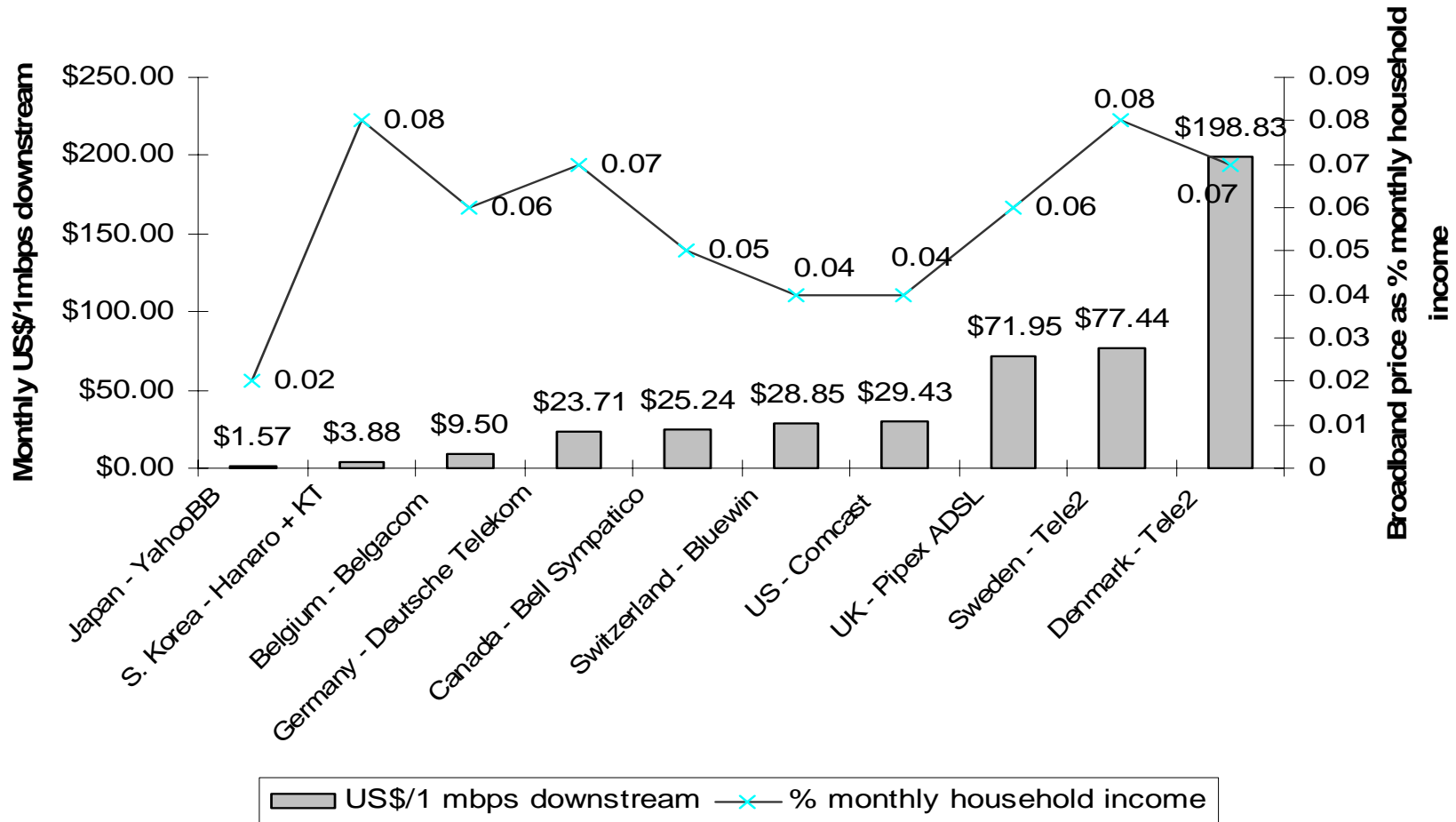
- Cable modem price of ~\$50 is revenue maximizing price level
- However, this does not incorporate benefits of network effects and of other positive externalities to society and economy of high BB penetration

Demand for Cable Modem Service



Selected International Broadband Prices (PPP adjusted) March - May 2003

Source: ITU Promoting Broadband: Background Paper

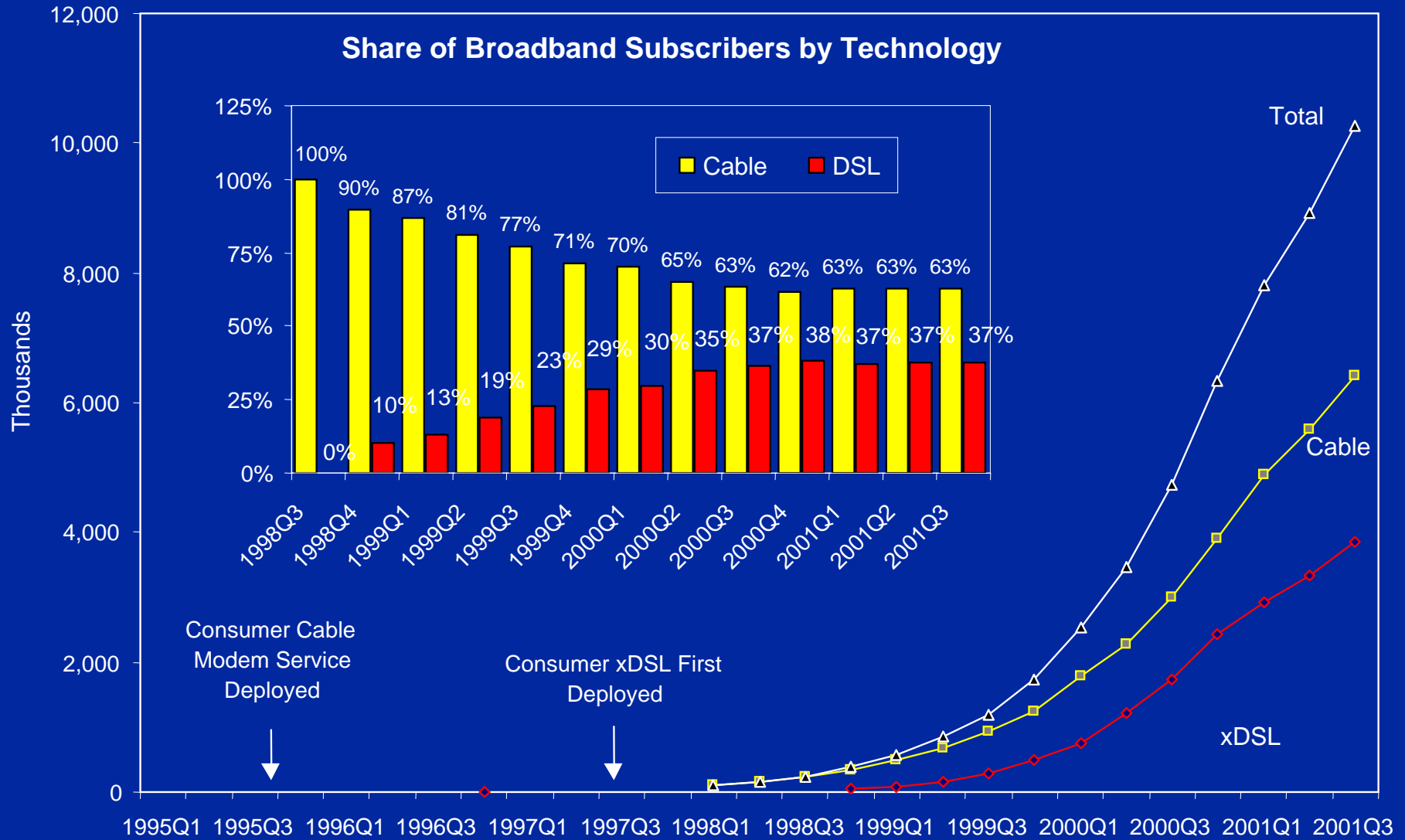


- Broadband is cheaper than 20 hours of dial-up Internet service in Belgium and Japan.

BB Platform Concentration Index

Country	HHI
Japan	2479
Sweden	4313
US	4569
Belgium	4957
Canada	5050
UK	5081
Switzerland	5101
South Korea	5312
Denmark	5635
Germany	9258

DSL and Cable Modem Broadband Adoption



SOURCES: Telechoice, Cable Datacom News, DSL Prime News, company reports and analyst estimates.

DSL BB 2003 2Q (mil)

SBC	2.8
Verizon	2.0
BellSouth	1.2
Qwest	0.6
Covad	0.5
Sprint	0.2
Total DSL	7.4

Cable BB 2003 2Q (mil)

Comcast	4.4
Time Warner	2.9
Cox	1.7
Charter	1.4
Cablevision	0.9
Total	13.3

DSL vs Cable

- DSL 3-5% of ILEC revenues
- Cable Modem 20% of cable revenues

DSL

- Subscriber acquisition/deployment
\$240/customer (w/o CPE)
- Churn 1-3.5%/month (~40%/yr)
- Cable : DSL = 2.5:1
- Plans for lower-cost “broadcast”
DSL neighborhood installed with
self-activation

Competition

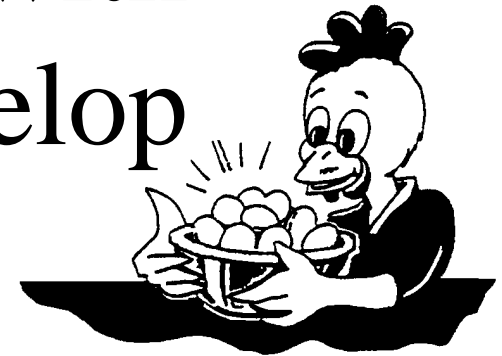
- FCC report: Cable companies, rather than incumbent telecom carriers, have been the leaders in introducing broadband access services to OECD countries.

Cable vs DSL

- **Cable: No conflict over goals -**
Broadband incremental revenue for cable providers, ~20% of revs
- **DSL: Goal conflict**
 - DSL: \$45/month for 1 MB/sec
- **Leased line--**
 - T-1:~1.5 MB/sec, \$1000 in 1998

But Most Important Demand Problem: Applications

- Chicken and Egg: Without a mass market of consumers with broadband access, why develop applications?
- Without new applications, why get BB service?



In US, BB supply ahead of demand. Nevertheless, US

Policy Priority: Supply Side

- FCC removes restrictions on BB by phone and cable companies
 - Classify BB as unregulated “information service” --unsuccessful
- Provide inexpensive network elements to independent DSL providers
- Unlicensed spectrum allocations
- No difference of BB of Bush and Clinton-FCC

FCC BB Policy Initiatives

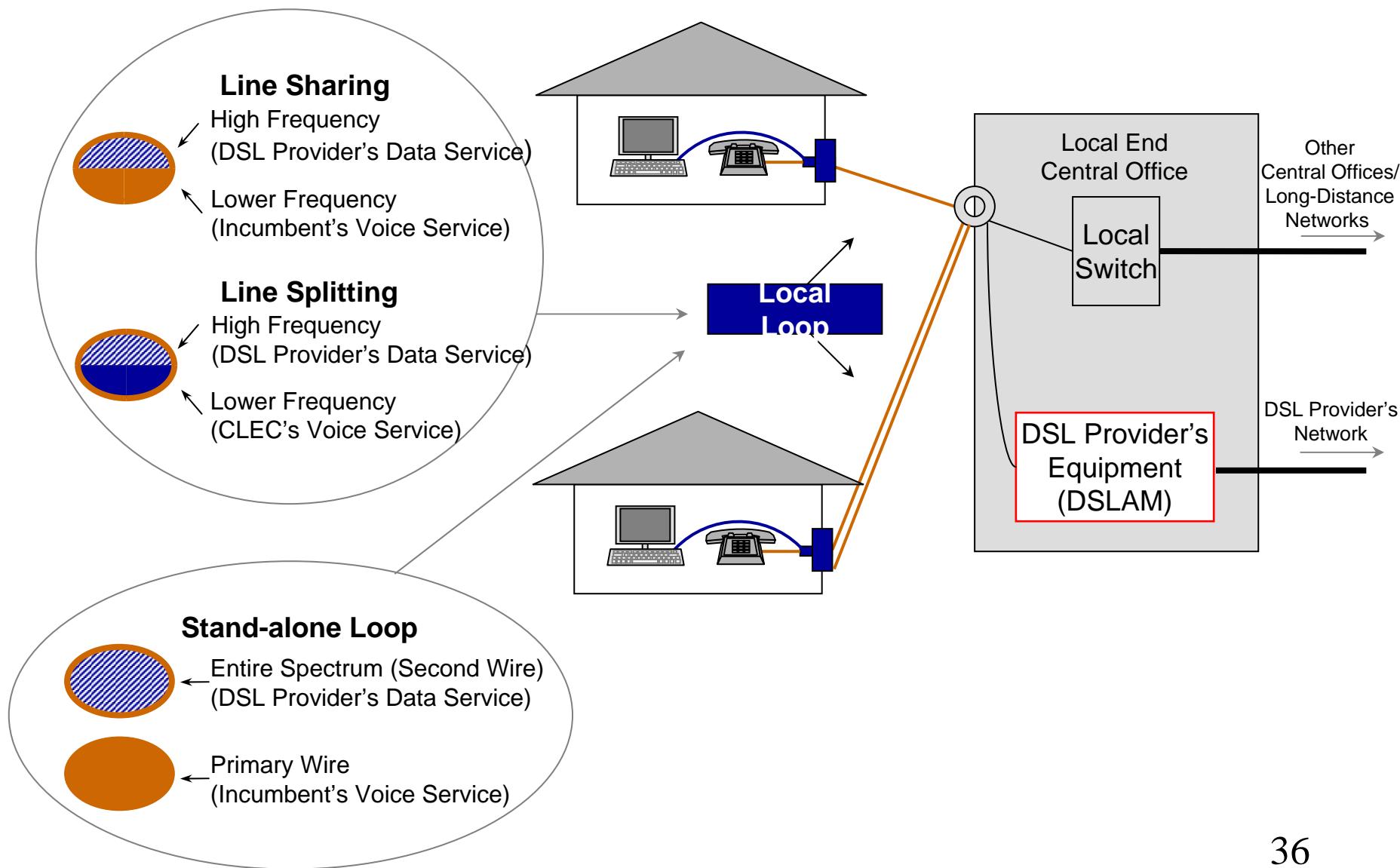
2. Facilitating Entry

- Unbundling, line sharing, satellite spectrum; 3G; unlicensed spectrum
- Preventing local gov's restrictions, supporting local initiatives

BB Policy Initiatives

3. Removing asymmetry of cable vs telecom

Unbundled Network Elements – DSL Service



Expanding Regulation to Cable

- “Open access” to cable internet distribution by non-affiliated ISPs and portals
- AOL/Time Warner required open access as condition for merger, by antitrust agency FTC in last days of Clinton Administration

National Academy of Science Task Force

Recommendations

- Defer new regulation in the early stages
- Structure regulation to emphasize facilities-based competition
- Take active steps to promote increased or accelerated deployment
- Increase local initiatives to promote broadband deployment
- Defer a universal service policy for broadband

Congressional BB Bills: Also
Supply-oriented
Tax breaks, loans,
subsidized prices, IN-2,
(e-rates for schools and
hospitals exception).

- **Rural America Deployment Bill 2001**
 - Low interest loans for rural broadband services, \$80 mil
- **Broadband Expansion Grant Initiative of 2001**
 - To provide grants and other incentives

- **Broadband Internet Access Bill of 2003**
 - Tax credits
- **Jumpstart Broadband Bill(2003)**
 - FCC to allocate spectrum for unlicensed use
- **Rural American Digital Accessibility Bill (2002)**
 - Grants and loans for BB

- **Broadband Deployment and Telework Incentive Bill**
(Rockefeller bill) 2001
 - Tax incentives for BB deployment, and to promote employer and employee participation in telework arrangements; \$413 mil;

In Contrast, Gov't
Policies should
Encourage Broadband
Demand

- Loosen Intellectual Property Rights,
 - e.g. temporary “fair use”/compulsory license for older films and music sent over broadband

- Facilitate micro-payment systems through central bank
- Facilitate tele-work, distance education, tele-medicine through removal of restrictive liability rules, etc.
- Enable VoIP, IPTV, etc.

Potential Gov't Policies to Encourage Broadband Demand

- Identify and eliminate government bottlenecks to broadband applications and network deployment
- Government as a lead broadband user, and information service provider

Applications

- Public Services
 - subsidized
- Media companies
 - Mostly commercial, asymmetric
- Peer-to-peer
 - Mostly non-commercial, symmetric

Public Services

- Distance education
- Tele-medicine
- E-government



Media Company BB

- Music downloads
- Games
- Adult
- Internet TV/VOD
- Promotion-TV
- Archival TV

BB Radio

- Many radio stations drop internet simulcasts
 - Due to royalty requirement to copyright holders and advertising actors unions
~.14cents/listener/song
 - No ad revenues

Commercial Music Download

- Finally, music industry supports real music downloading (Apple iTunes)

Independent (“dot-com”) Video Distribution failed so far

“Black September” 2000

➤ Pseudo.com

➤ AtomFilms

➤ Digital Entertainment
Network (DEN)

➤ New efforts: Cinema Now;
Filmsneed

Established Media: Movielink

- Joint venture of MGM, Paramount, Sony, Warner, and Universal.
- Apple iTunes model also into video

Intertainer.com

- 1996 with backing Intel, Comcast, and Thomson.
- Closed operations and lawsuit against Movielink for anti-trust violations
- Subscription price \$8, rental fees of \$3-\$5.

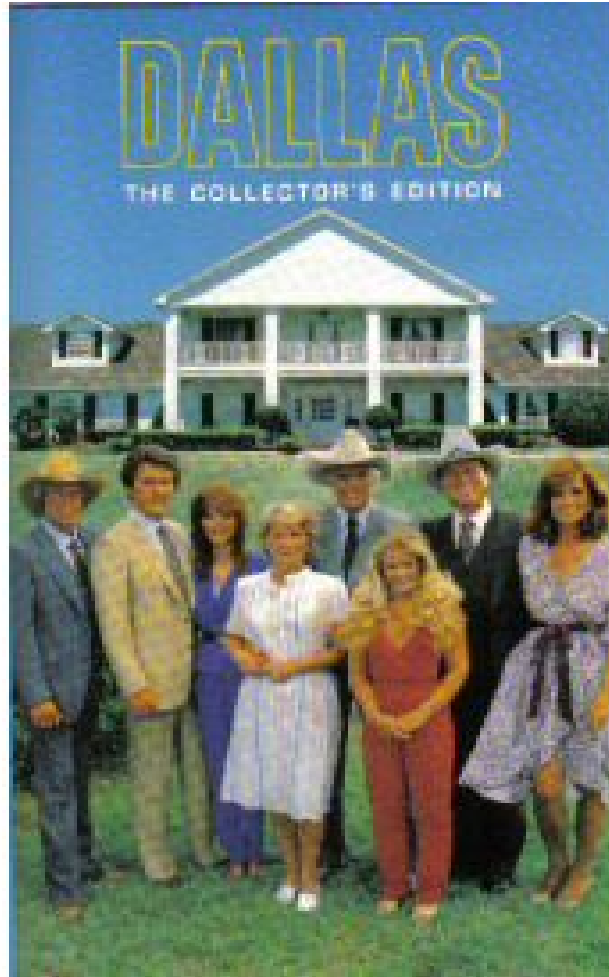
BB Content Packagers

- RealNetworks
 - Streaming media
 - Sporting events
- Yahoo Platinum
 - TV shows
 - Parental controls
 - Corporate PR programs
- AOL Broadband
 - Exclusive concerts

Multicasting: Yahoo! Broadcast

- corporate PR via audio and video streaming.
- Applications: product launches, press conferences, e-learning, seminars, keynote addresses, shareholder meetings, quarterly earnings calls and corporate TV channels.

IPTV: Archival Programs



IPTV Content Model: Specialty Content



(<http://www.zdnet.com/zdtv/>)

IPTV Content Model: Promotions



Content distribution infrastructure providers

- Akamai, Inktomi and Digital Island
- Streaming services that on their distributed caching networks worldwide enable content providers

Content Provider Problems

Difficult to establish payment system

- Advertising model does not work

- People do not subscribe

Content Problems

- Cost
 - Service can cost an additional \$10-15/month on top of high speed service cost

“Killer-App”: Peer-to- Peer, User- generated

- VoIP
- Audio
- Video

In Contrast, Peer-toPeer Successful: subscriber-provided information

- VoIP (voice)
- MP3 (audio)
- V2V (video)
- Interactive games
- Desktop videoconferencing
- M2M (Machine to machine)
- B2B
- Adult
- Distrib computing

Internet Telephony (VoIP)

- Voice-to-voice by users
- Cheap way to bypass traditional telephony
 - Regulatory advantage:
no access charges
(for IXCs: 2 x~3¢/ min)
- Low entry cost
- Can be integrated with video, data and text

VoIP

- Vonage
 - \$35 unlimited national calls
 - Multiple locations ringing

VoIP

- Time Warner Cable
 - Maine, Rochester, South Carolina
- Cablevision
 - Lightpath
- Independent VoIP
 - Vonage (\$35 unlimited national calls)
 - Gemini
 - Net2Phone

P2P Volume

- 400-600,000 video downloads daily
- Several million audio daily downloads

MP3 and Video P2P Application Providers

- P2P United: Grokster, Morpheus, BearShare, LimeWire, eDonkey and Blubster
- Distributed Computing Industry Association (DCIA): KaZaA and Altnet
- Others: eMule, Gnutella, BitTorrent

- **BitTorrent**

P2P file swarming starts

downloading from A, it will start
uploading to card D

Technology Trends

- CalTech: FAST (R&D Project)
 - Download DVD-quality movie in 5 seconds
- Internet II
 - Dispatched 6.7 GB (more than a typical movie) halfway around the world in one minute

V2V:Piracy

- Thousands of movies and TV episodes.



V2V: Games and Violence



V2V: SEX



(<http://ctc.sexzine.com/vid/interleave/frame1.htm>)

V2V: Office Viewing

- Huge number of DLs after Sept. 11, 2001
- 1.5 Mil viewers for Victoria's Secret lingerie show
- sports



V2V: Special Events

1.4 Mil viewers for live birth



[Http://agt.net/coolite/livebirth.html](http://agt.net/coolite/livebirth.html)

What is P2P?

- No central server
- More like a fish net than a bicycle wheel
- Decentralized storage and indexing

Industry Response

- Seek legal prohibitions
- Litigation
- Technology fixes
- Start own commercial distribution

Restrictive Bills

- Sen. Ernest Hollings (D-S.C.) Bill
- Requires computer and electronic makers to install anti-copying technology on electronics devices like DVD players.
- Berman Bill. Permits content providers to engage in electronic counter-measures incl attacks

- **The opposite approach would *grow* BB as a future huge market for media firms by encouraging P2P**

Example

- Compulsory License: Users would pay a set fee for video downloaded to a copyright collective such as ASCAP
- Artists/producers would then be paid out of this fund

P2P is the solution,
not the Problem!

**The expansion of BB
connectivity has
media and content
Implications**

Presentation Outline

1. State of broadband
in America

2. Implications of
American broadband
for other countries

- For several centuries, culture flowed largely in one direction: out of Europe, and to the colonies and the rest of the world



- Then, after World War I, the flow was reversed for the young medium of film



http://moderntimes.com/palace/chaplin/cc_image/immigrant.jpg



- This led to the effort of protection and subsidization of national cultures from the challenge by a handful of American media companies
- Largely unsuccessful

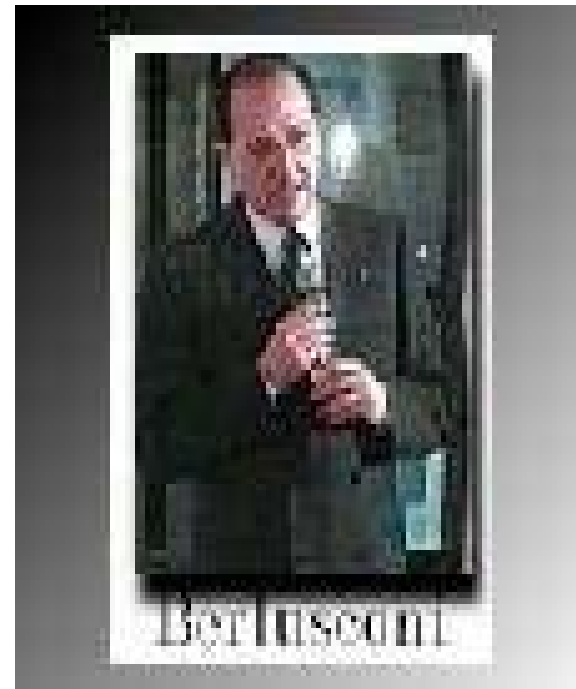
- 2002: Of world's 40 highest grossing movies: American films top 40 places

- When TV emerged in the 1950s, it actually helped the maintenance of national cultural policies, because in contrast to film it could be controlled through monopoly public broadcast institutions

Early TV: National Content Gatekeeping



- But this system broke down in the '80s with the global emergence of private TV



- And now, television over the Internet is knocking
- Will it be a multi-colored richness of many sources or will it be more of the dreaded Hollywood culture?

Internet TV



(<http://cc.uoregon.edu/iptv/>)

**So what will be the
content of Internet-TV
and where will it come
from?**

- Transmission Technology
is Media Destiny



3 Fundamental Trends:

1. The price of international transmission is dropping rapidly.
2. Domestic BB penetrations are increasing rapidly in many countries
3. BB-content is expensive and has strong economies of scale.

Cost

Content/Sec

Distrib/Cap/Sec

Cable

\$111/sec

0.046m¢

Internet TV

1.85m¢

- Films (Hollywood variety), is 130 times as expensive to produce as live quality theater, but it is almost 1000 times cheaper to distribute

Internet TV

- Distribution cost 5 millicent per second. Expensive
- Content cost is hard to estimate. But will be expensive, too.

- One would not want to use Internet TV for regular video content distribution
- Internet TV's market is for applications that go beyond regular TV: interactivity, asynchronicity, linkages, and multimedia

- The interactivity and multimedia of the medium require additional features beyond straight video.
- Commercial providers will have to offer premium level content.
- It cannot possibly be cheaply produced

- To produce such content is expensive
- It requires creativity, many programmers, lots of alpha and beta testing, and many new versions

- Such expensive content exhibits strong economies of scale on the content production side, and network externalities on the demand side.

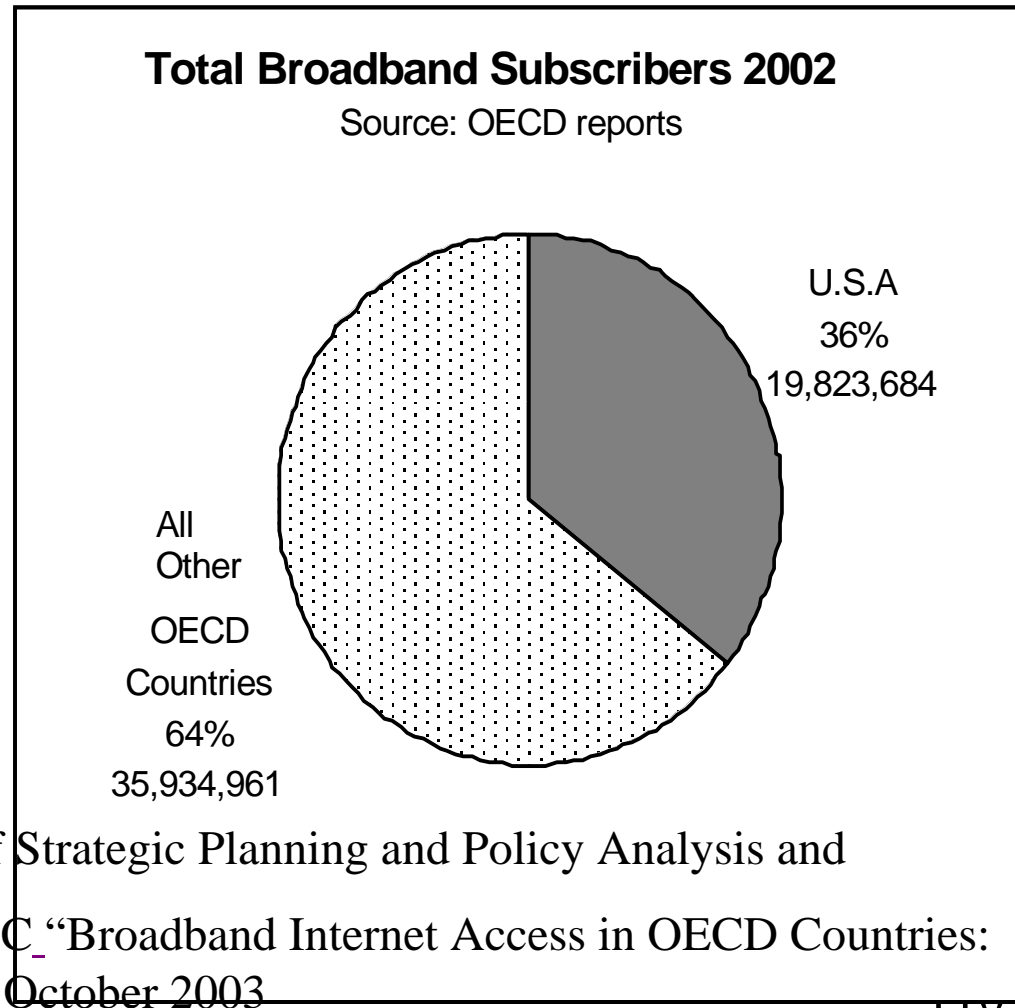
- BB-TV favors content providers
 - With big budgets
 - Who can diversify risk
 - can distribute over other platforms

American firms will be especially successful in e-content for BB-TV

- Domestic critical mass
- Software and hardware industries
- Access to risk capital
- Big entertainment & content producers
- Geographic clusters
- Language
- Diverse culture

- BB TV combines the strengths of the US in entertainment, Internet and E-transactions
- Add to that economies of scale, and there is nothing that can match it in the near term

US BB Market Accounts for over 1/3 of World Market

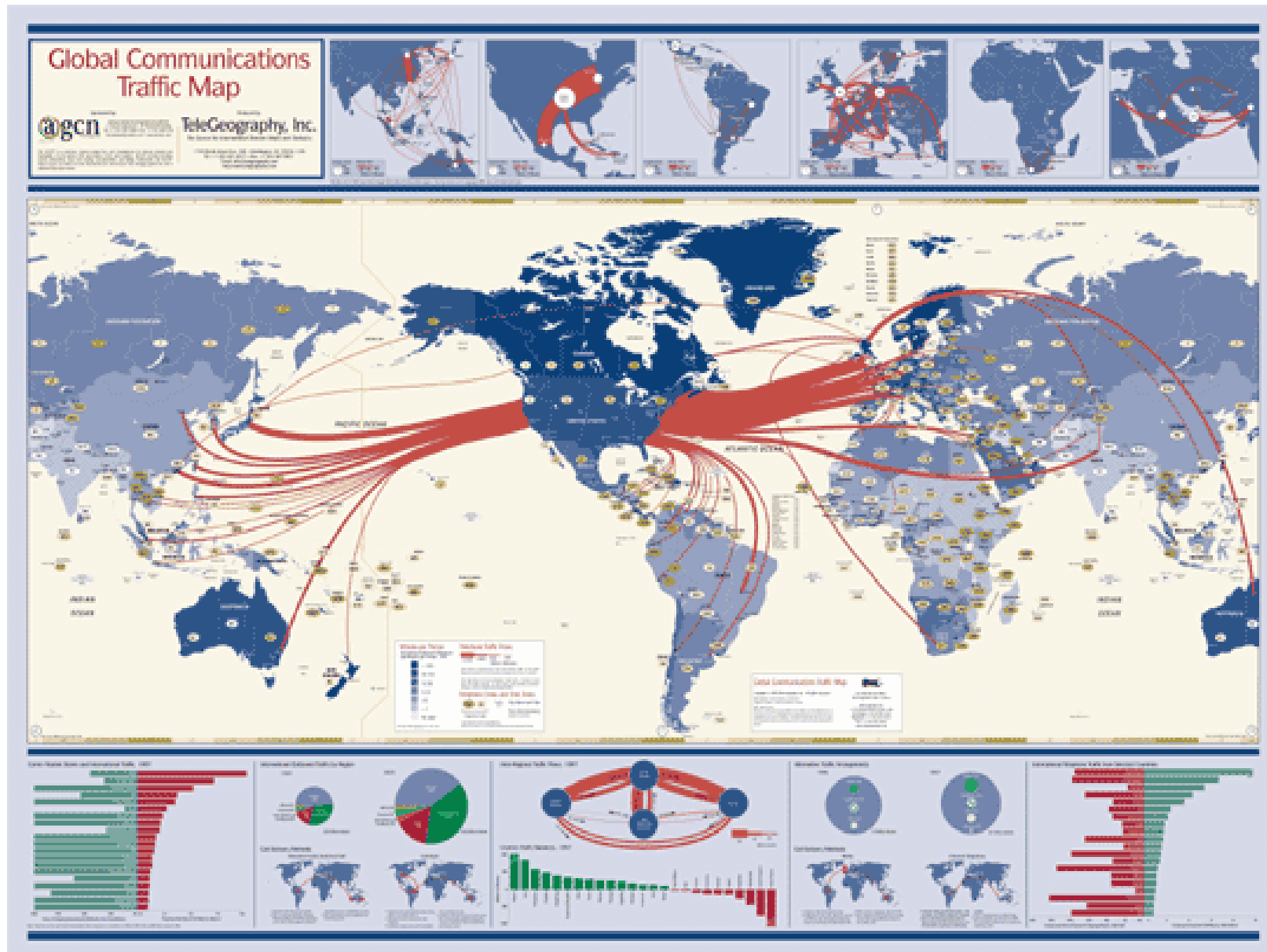


Individualization of Content comes with a Larger Geographic Footprint

- “Micro-casting” also means “Global casting”
- need to be aggregate audiences internationally as they fragment nationally.

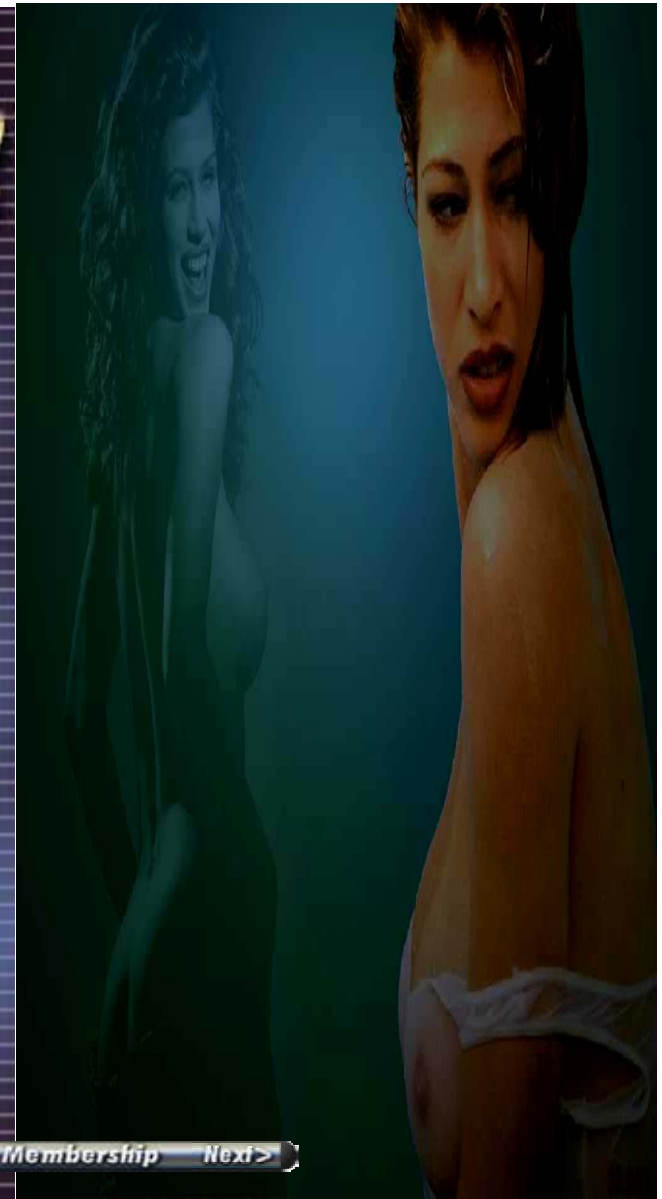
- Once established a successful model for the US market, and once transmission price is near zero, there is no reason to stop at the border
- And therefore, there will be an inevitable political backlash against Internet-TV

U.S. as content Hub

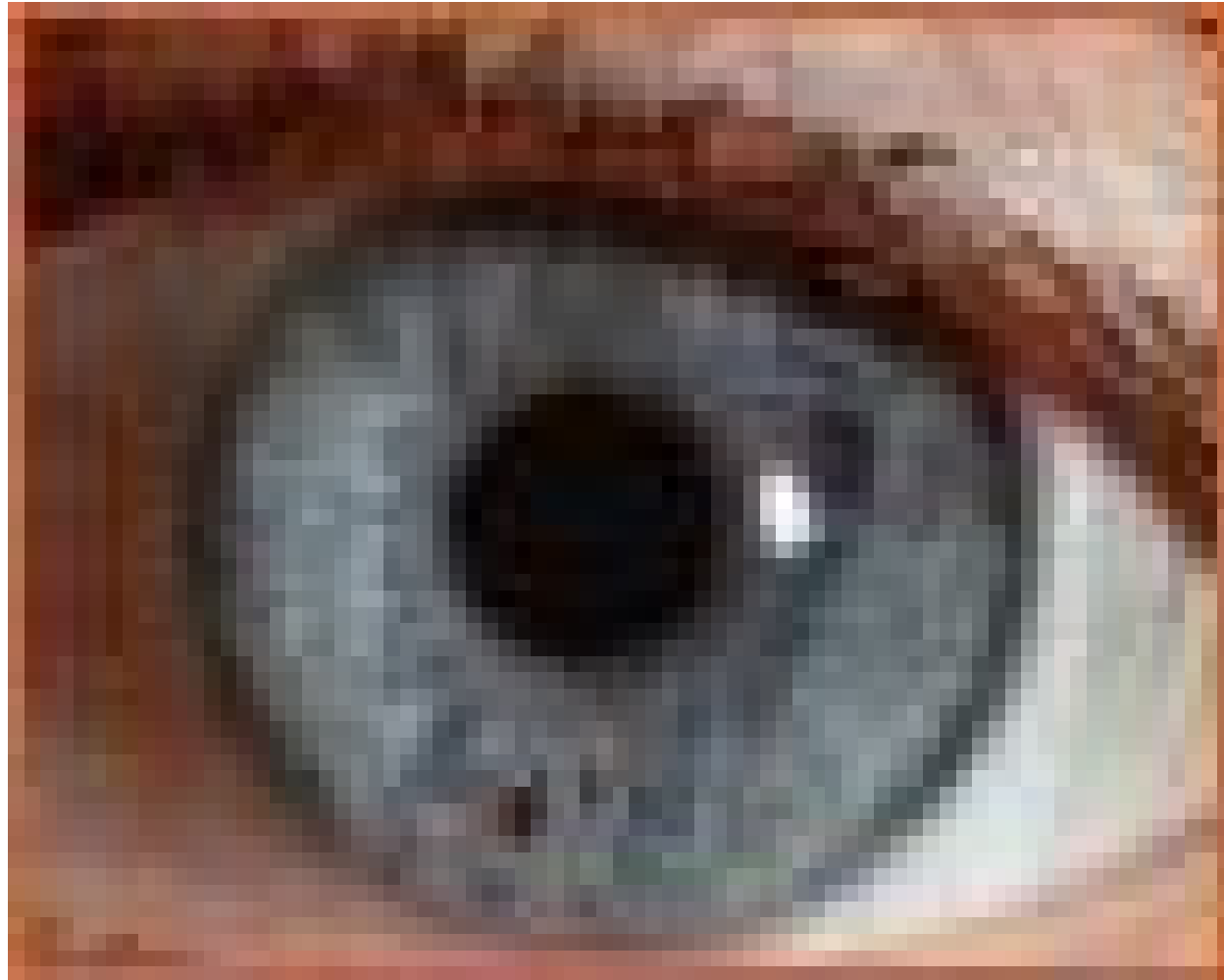


- What will other countries do?
 - Quotas will not work
 - Subsidies likely
 - Most likely: various restrictive regulations based on specific problems

Regulatory Issue: Protect Traditional Morality



Regulatory Issue: Privacy protection



Regulatory

Issue:

Market power



Regulatory Issue: Consumer Protection

- Fraud and misrepresentation on IP-TV
- Video spam

Regulatory Issue: Taxation of IP-TV and of its Transactions

Instead of Restrictive Regulations, Need to Encourage

Content Creation

- Establishing BB connectivity will be the easy part. Developing content and applications will be the hard part
- This is the priority, or else BB will become a one-way street for content and applications

- Otherwise, we will experience Broadband content trade wars in the future
- This will be the challenge now
 - How to move the next level of Internet applications–BB-TV -- while not having it strangled in its cradle

End of Presentation

Vielen Dank

- Visits
 - Broadband $>$ narrowband for all income levels – no pattern as a function of income

BB Applications



- AT&T President Dorman:
“Consumers [do] not have
much reason to get broadband
yet” (August 2001)

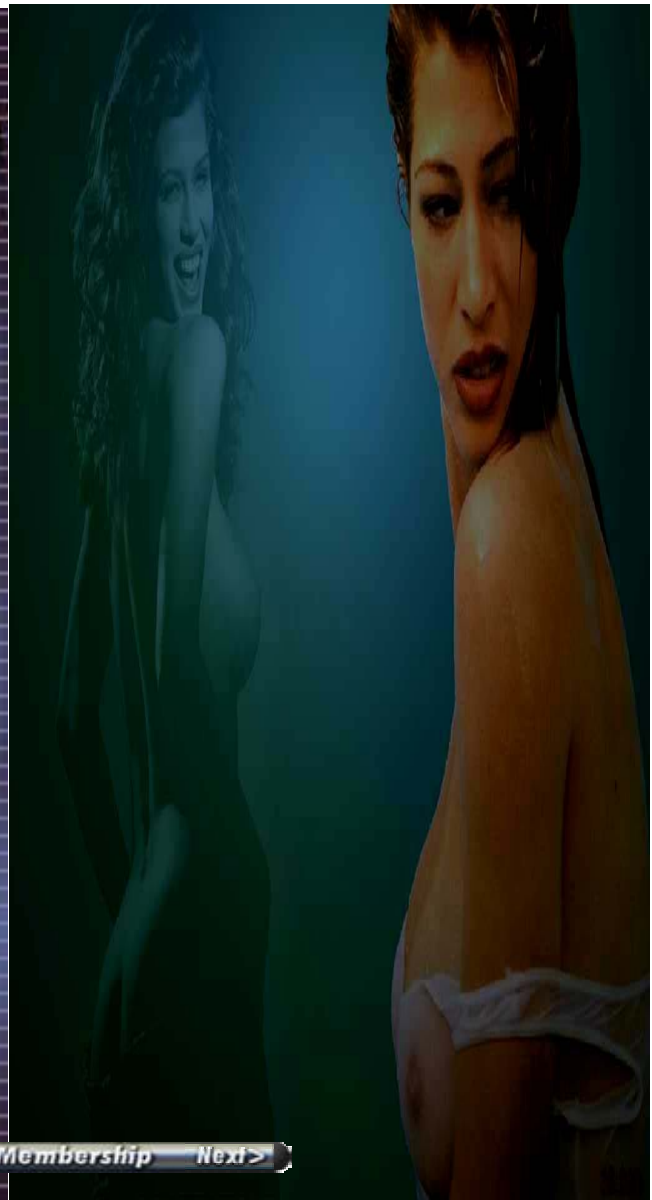
- Content
- Behavioral
- Business/econ

Office Viewing

- Internet TV Network
 - 1 Mil video streams for Clinton impeachment
 - 2 Mil for Iraq bombing
 - 1.5 Mil viewers for Victoria's Secret lingerie show
 - Huge number of hits after Sept. 11, 2001



DOOM



Broadband Content

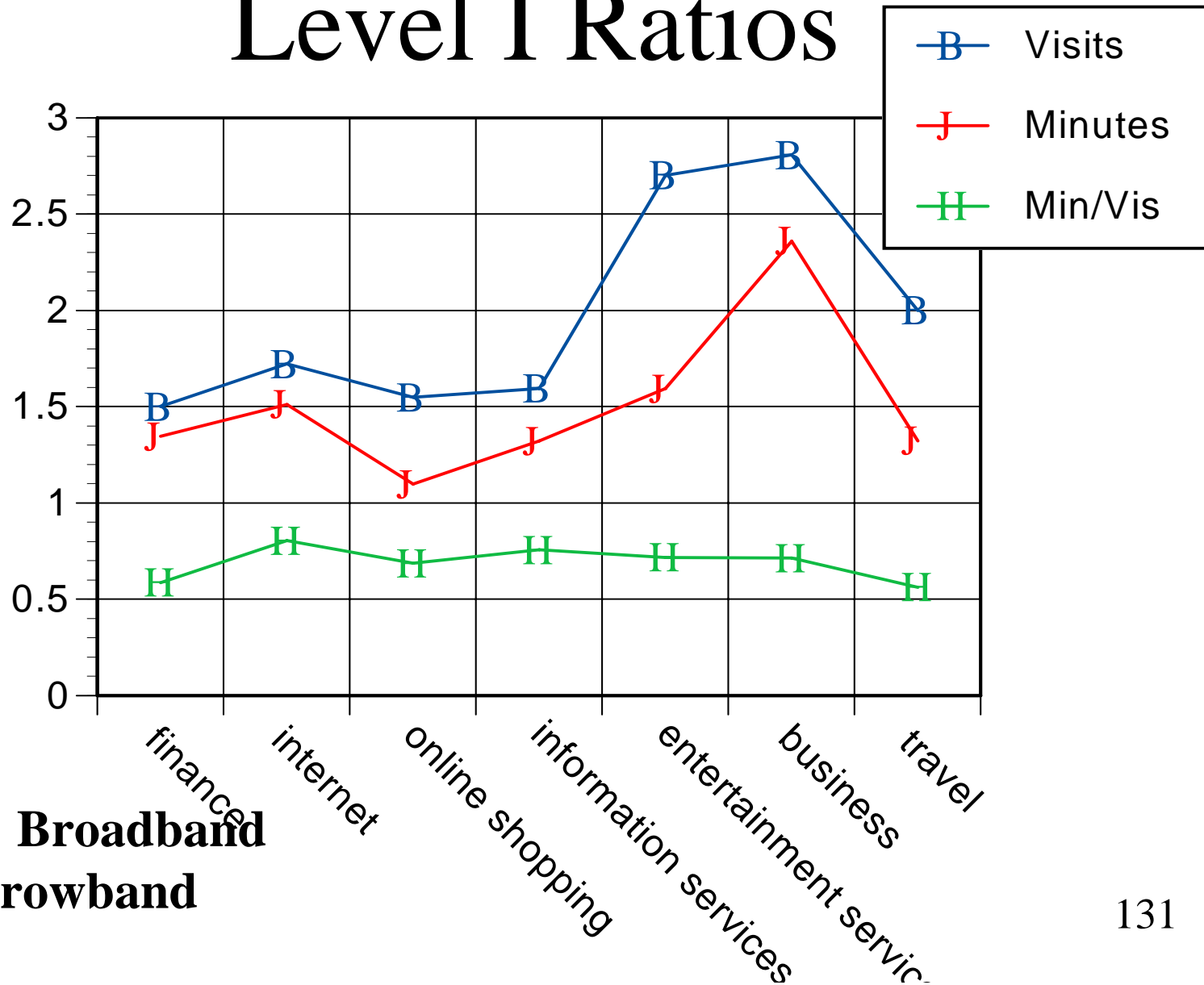
- Exclusive original content for broadband users
- Flash-based video
 - Movie trailers
 - Magazine quality photos
- Games
 - AOL & Sony: BB applications for PS2, including voice-based instant messaging
 - Microsoft: Xbox Live game

- One would not want to use Internet TV for regular video content distribution
- Internet TV's market is for applications that go beyond regular TV: interactivity, asynchronicity, linkages, and multimedia

Classification of Sites

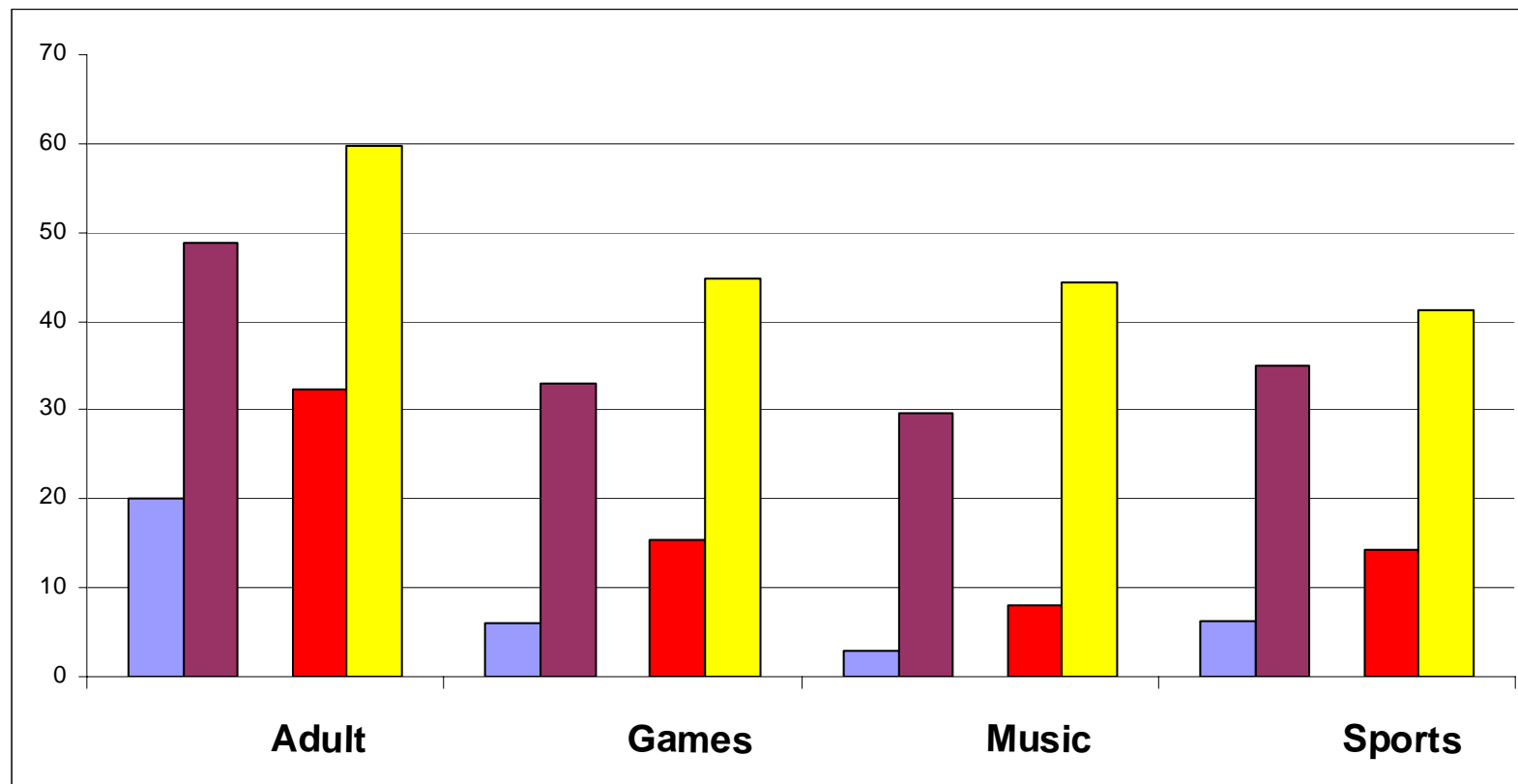


Level I Ratios



**Ratio: Broadband
to narrowband**

Entertainment Sites Visited



■ Dial-up > 20 visits ■ Dial-up At least 1 visit
■ Broadband > 20 visits ■ Broadband At least 1 visit

- Broadband is cheaper than 40 hours of dial-up Internet service in Belgium, Sweden, Switzerland, and Japan.

Rate Structure for Dial up Internet and DSL Service

Source: OECD, 2003

	Broadband subscribers per 100	Local telephony rate structure	Unmetered telecom access for dial-up Internet?	Internet access pricing structure	DSL pricing structure
Korea	21.4	Metered	Yes	Metered	Flat
Canada	11.7	Unmetered	Yes	Flat	Flat
Belgium	8.5	Metered		Metered	Flat
Denmark	8.3	Metered		Metered	Flat
Sweden	8.1	Metered		Metered	Flat
U.S.	6.9	Metered/ Flat/Unmetered	Yes	Metered/ Flat*	Flat
Switzerland	6.3	Metered		Metered	Flat
Japan	6.1	Metered	Yes	Metered	Flat
Germany	4.0	Metered		Metered	Flat
U.K.	2.3	Metered	Yes	Metered/ Flat	Flat

What BB is used for

- High speed web surfing
 - #1 reason for subscription
 - Inspires 2/3 of upgrades
- Always-on

- Media entertainment:
 - Audio
 - Video
 - Pirated programs
 - TV at the office
 - Movie download
 - Games and adult programs
 - Telecommuting and working from home
 - VoIP

Discrete Choice

- Choices
 - Dial-up vs No Internet
 - Dial-up vs Cable modem
 - Dial-up vs ADSL
 - Dial-up vs Cable modem or ADSL
 - Cable modem vs ADSL

Dial-up vs CM Access

	Dial-up	ADSL
Dial-up	-0.230	0.518
ADSL	0.010	-0.895

Dial-up vs ADSL Access

	Dial-up	ADSL
Dial-up	-0.168	0.423
ADSL	0.040	-1.364

CM vs ADSL Access

	Cable Modem	ADSL
Cable Modem	-0.587	0.766
ADSL	0.618	1.462

Operational problems of DSL:

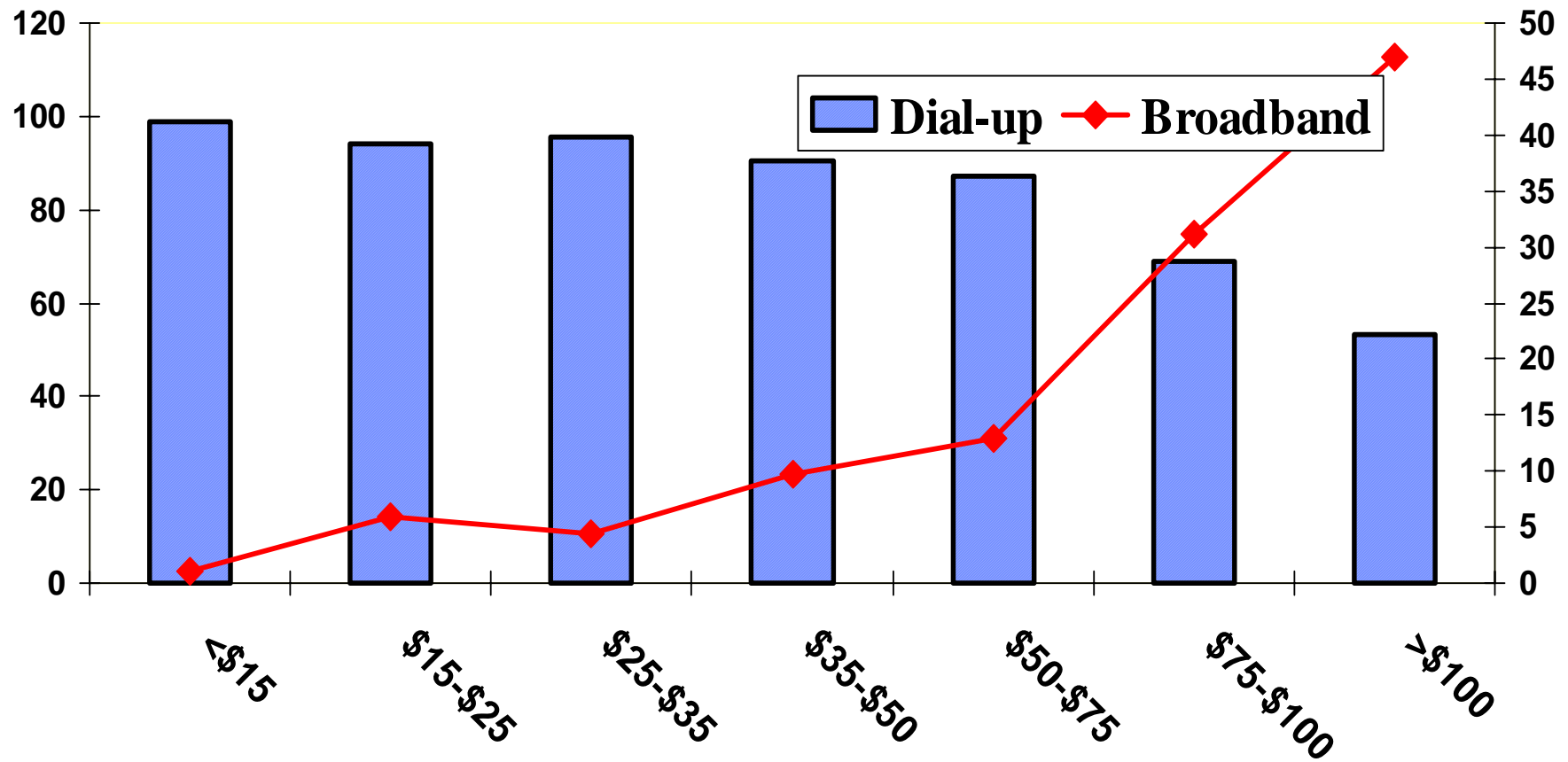
- Installations required multiple visits to residences and businesses to solve problems
 - consumer DSL pricing \$40 to \$50 a month
 - But cost of truck roll \$150 to \$200 a year for many subscribers
 - Customers self-installation

- Marketing problem when offering an attractive service in cities where less than half of population could get it
- Range limited to 8,000 feet from the central office
- “DSL-lite”
 - Customers self-installation
- Customers must open the computer and insert a modem card

Broadband Targets

- 1Mbps in 100million households in 2010
 - (Technet initiative)
- 1 Gigabit to 10 mil users in 2010.
 - (Cenic initiative)

Demographic Factors



Distance Learning

- Instructional delivery that does not constrain the student to be physically present in the same location as the instructor.

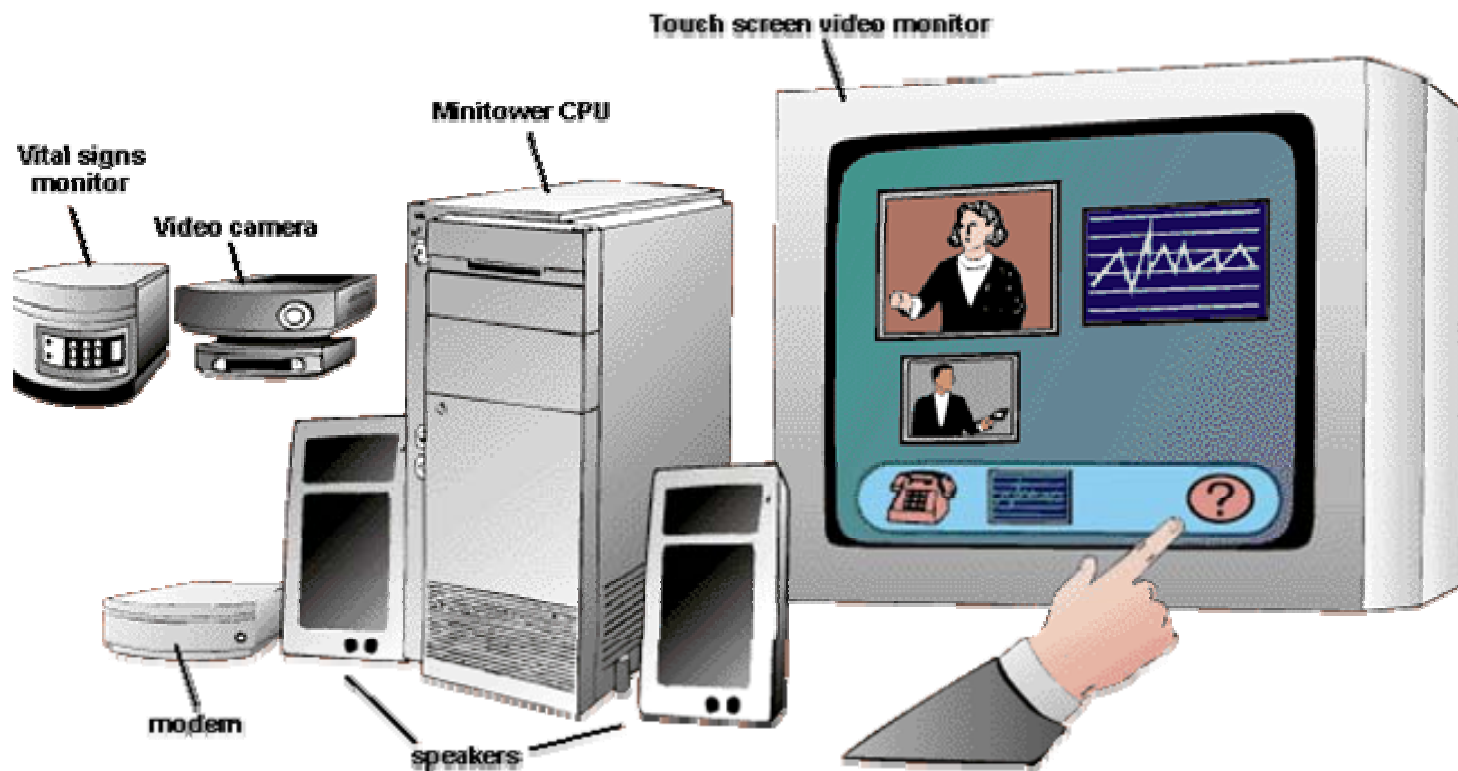
Uses

- Students far away can take Interactive classes via computer and videoconferencing
- Vocational Training
- adult education classes

Who uses Distance Learning?

- Educators: Primary, Secondary, Universities
- Governments
 - Workforce Development Programs
 - Support Educators

Teleconferencing



<http://www.aafp.org/fpm/980100fm/lead.html>

Teleconferencing Applications

Group discussions

Investor relation events

Product rollout/marketing

Media events

Training

Leadership building

Internal communication

Customer relationship management

Knowledge sharing

Teleconferencing

- Adopted slowly because corporate culture demands face-to-face meetings

Telemedicine

- Transfer of electronic medical data from one location to another. (i.e. high resolution images, sounds, live video, and patient records)

Users of Telemedicine:

Health providers
specifically used in:

Dermatology, Oncology, Radiology,
Surgery, Cardiology, Psychiatry,
Home health care, Correctional
facilities, Rural health care centers,
Physicians doing clinical research

Current Technology

- KaZaA (#1)
- BitTorrent
- Gnutella

Potential Speakers

- Harvard Professor William Fisher-
compulsory licenses (video?)
- Alan Morris Executive Director ,
Sharman Networks Limited
(KaZaA)
- P2P United Executive Director
Adam Eisgrau
 - CONTACT: Mike Collins, +1 202 494 6105, or
mcollins@mikecollinsonline.com, for **P2P United**; or
Adam Eisgrau of **P2P United**, +1 202 62 3726

Questions

- What about statutory licenses?

- P2P applications communicate with one another in an ad hoc fashion that does not map to the physical topology of broadband networks and can account for more than 70% of residential traffic.

Current Technology

- File-sharing program: a free, decentralized, global file distribution network to anyone with an Internet connection
 - KaZaA (#1)
 - BitTorrent
 - Gnutella
- Majority of file swappers use private FTP connections
 - Direct connections between computers

Premium Content Providers for Broadband

- Follow model of major pay cable programmers on selling a premium service offering more options on top of basic service
- Focus on video content

Content Problems: US Consumers Willingness to Pay for Content

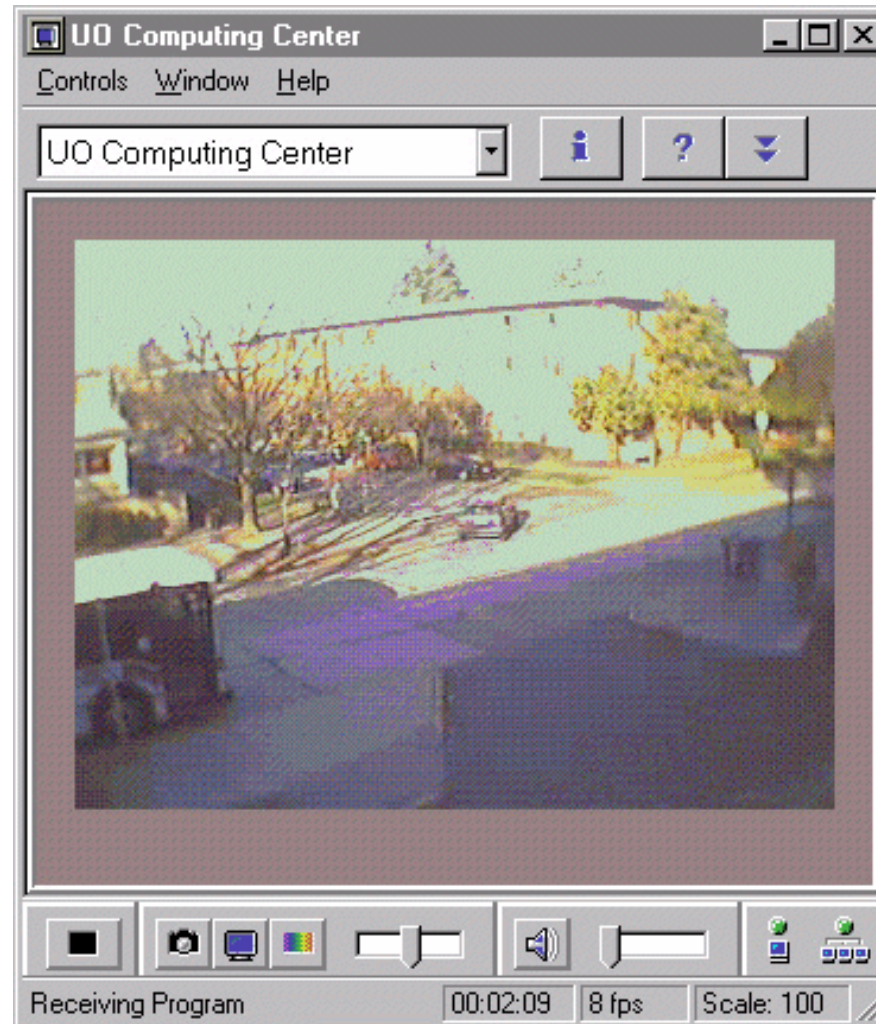
- Exclusive online content (i.e., sports games, concerts, etc)
6%
- Gaming **17%**
- Music **16%**

- Despite lack of willingness to pay, online content revenues have increased 20.2% to \$1.3 billion in the past year
- Top grossing content
 1. Personals & dating
 2. Business & investments
 3. Entertainment

- Top two types of sites consumers are subscribing to for original content DO NOT require high speed connections
 - 70-80% of time online is spent on communication, not content viewing

- Even though research sites 44% of Americans have experienced an Internet audio or video broadcast, they are obviously not paying for it

Internet TV



(<http://cc.uoregon.edu/iptv/>)

IPTV Content Model: Participation



IPTV Content Model: Shopping



YOUR ACCOUNT

HELP

SELL ITEMS



BOOKS

MUSIC

DVD &
VIDEO

TOYS &
GAMES

ELECTRONICS
& SOFTWARE

HOME
IMPROVEMENT

AUCTIONS

zSHOPS

(<http://www.amazon.com/exec/obidos/subst/home/home.html/002-6125271-2483401>)



The main iQVC page welcomes users with a golden splash that is carried throughout the site.

(<http://www2.hp.com/Ebusiness/may/iqvc.html>)

Content Model: Info-Customization

BBC ONLINE NETWORK

[HOMEPAGE](#) | [SITEMAP](#) | [SCHEDULES](#) | [BBC INFORMATION](#) | [BBC EDUCATION](#) | [BBC WORLD SERVICE](#)

BBC NEWS

 News in Audio  News in Video [Newyddion](#) [Новости](#) [Noticias](#) [أخبار](#) [国际新闻](#) [粵語廣播](#)

[\(http://news.bbc.co.uk/\)](http://news.bbc.co.uk/)

CNN.com

[\(http://www.cnn.com/\)](http://www.cnn.com/)

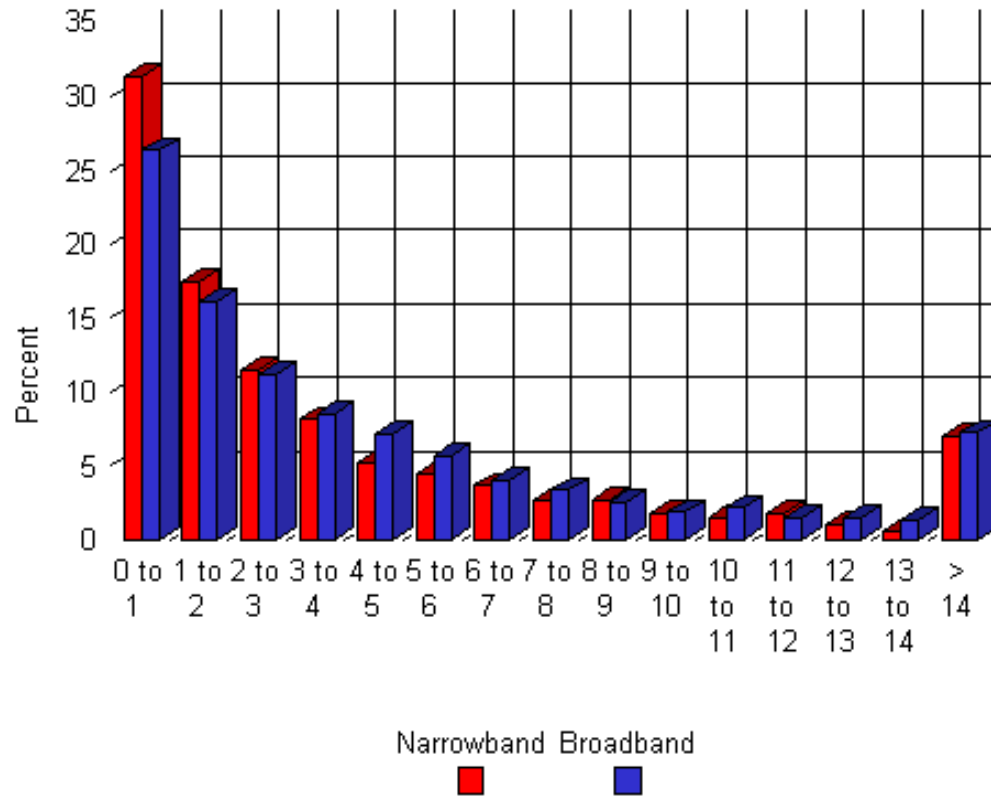
Regulatory Status of BB

- add

BB USA

- 21 million subscribers
- 33% of Internet connections
- 55% of online access time

Distribution of hours on line



- Cost advantages of cable-style distribution over internet-distribution of video are significant, by a factor of about 40, and even increase with digital cable/compression

Demand Elasticities

–Rappoport, Taylor, Kridel

•Cable Mod -0.81, -1.05

•DSL -1.17 -1.55

–WTP

•Cable Mod -0.75 -0.98

•DSL -1.17 -1.76

- Existing efforts:

- IFILM

- AtomShockwave

- MediaTrip

- Hypnotic.com

- Distantcorner.com

- Icebox.com

- Heavy.com

- Mondomedia

- Worldbrain.com

- Wirebreak.com

- Voxy.com ¹⁷²

User Generated Content

- Alltrue.com
- Sportscapsule.com
- Earthcam.com
- Anivision.com

	December 2002	DSL subscribers	Cable subscribers	Other subscribers	Total subscribers	Subscribers per 100
South Korea		6,386,646	3,701,708	39,959	10,128,313	21.4
Canada		1,642,554	2,008,566	-	3,651,120	11.7
Belgium		517,000	326,181	25,813	868,994	8.5
Denmark		307,055	133,003	5,784	445,842	8.3
Sweden		424,000	153,700	142,500	720,000	8.1
U.S. ^[1]		6,595,532	11,300,000	1,928,152	19,823,684	6.9
Switzerland		195,220	260,000		445,220	6.3
Japan		5,645,728	1,954,000	206,189	7,805,917	6.1
Germany		3,195,000	56,845	70,000	3,321,845	4.0
U.K.		590,000	779,319	2,000	1,371,319	2.3
OECD ^[2]		30,058,261	23,075,208	2,625,176	55,758,645	4.9

^[1] The numbers in this chart do not match exactly the numbers in FCC reports. FCC statistics show, for high speed services used primarily by residential subscribers:

See FCC, High-Speed Services for Internet Access: Status as of December 31, 2002 (Industry Analysis and Technology Division, Wireline Competition Bureau, June 2003) at table 3. Another clarification concerns the users of “other” platforms (i.e., non-DSL, non-cable modem). As noted in the chart, the OECD reports that there are 1.9 million “other” subscribers in the United States. This is based on the FCC’s number for June 2002, which includes commercial subscribers. Thus, the 1.9 million figure includes: about 1.2 million traditional wireline services, such as T1 and T3 lines or their symmetric DSL equivalents; about 0.5 million connections over optical fiber to the subscriber’s premises; and about 0.2 million satellite and terrestrial fixed wireless connections. *Id.* at table 1.

Regulatory Issue: Access by content providers to viewers

