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A Crucial Year for Broadband in America

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What's at Stake – America's Global Competitiveness

- Almost everything we do at work, at home, and at play will increasingly be done through broadband, at much faster speeds than today
- World economy is growing interconnected and “flat”
- The US is going to lose most of its manufacturing jobs to low-cost, low-wage nations
- US's best hope: prepare communities and population for high-tech, knowledge-based jobs
- **Critical need: prompt, affordable, and ubiquitous access to advanced communications networks, particularly fiber networks**

Effects of US Policy

“America's record in expanding broadband communication is so poor that it should be viewed as an **outrage** by every consumer and businessperson in the country. Too few of us have broadband connections, and those who do **pay too much** for **service that is too slow**. It's hurting our economy, and things are only going to get worse if we don't do something about it.”

FCC Commissioner Michael Copps
Washington Post, November 8, 2006

US Broadband v. Other Countries

Broadband lines as percent
of Population:

US 1st in 1990s ↓ 4th in 2001 ↓↓
10th in 2004 ↓↓↓ 15-24th now

Ave. Advertised ↓ Speed (US 14th): US: 8.9 Mbps Japan: 93.7 Mbps

Ave. Monthly Price (US 21th): US: \$ 53.06 Finland \$ 31.18

Ave. Price/Mbps (US 11th): US: \$12.60 Japan \$3.09

Ave. Price/Mbps Fastest (U.S. 18th): US: \$2.83 Japan \$0.13

Growth new subscribers (U.S. 17th): US: 4.21% Ireland 6.60%

Raw number of subscribers: US 3rd behind China and Euro Union

Composite (ITIF): Penetration + Price + Speed: US 15th

Broadband Comparisons

Dial-up

64 Kbps Phone Line •

128 Kbps ISDN •

768 Kbps •

3 Mbps Low Level Video

Wireless
DSL
Cable

1.544 Mbps T1 •

AT&T, TW
(6-10)

10 Mbps Ethernet •

Verizon,
Comcast
(5-50)

FTTN

100 Mbps Ethernet •

10-20 Mbps
HDTV Quality
Video Stream

FTTH

=> ∞

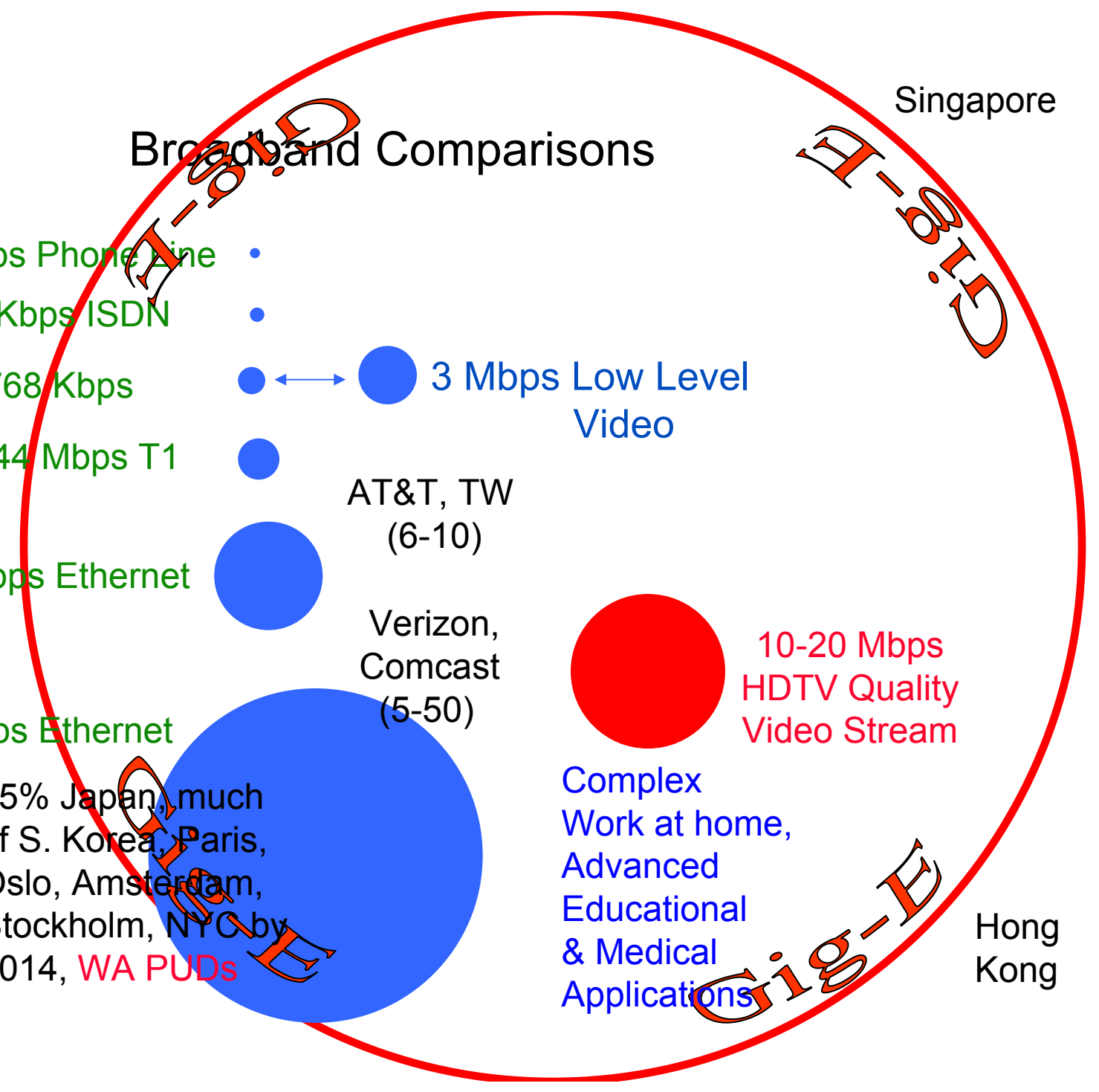
85% Japan, much
of S. Korea, Paris,
Oslo, Amsterdam,
Stockholm, NYC by
2014, WA PUDs

Complex
Work at home,
Advanced
Educational
& Medical
Applications

Singapore

Hong
Kong

From: Jon Moore



How Much Bandwidth Capacity is Enough?

- Context and Purpose
 - FCC: Define “broadband” – 200 kbps => 768 kbps
 - Application? Network? Nation?
 - Minimum for all Americans vs. High-end vs. Both?
 - Here: America’s and Washington’s global competitiveness
- Considerations
 - Uses and drivers (today and tomorrow)?
 - **What are the leading nations doing – ESPECIALLY partners?**
 - What are the US and the State doing?
 - Other factors

Multiple Uses and Benefits of Broadband

- Economic development
- Educational and occupational opportunity
- Public safety and homeland security
- Urban revitalization
- Affordable modern health care
- Telework (\$4/gallon and rising)
- Environmental sustainability
- Cost-effective government service
- Entertainment and Cultural enrichment
- Special needs elderly, disabled, young people
- Emerging new uses – e.g., Social networks, gaming, “Web 2.0,” the “Internet of Things”

Key Drivers – (1)

- Explosive growth of video – e.g. YouTube alone, over 100 million downloads and over 65 million uploads/day

“In three years' time, 20 typical households will generate more traffic than the entire Internet today. ...We are going to be butting up against the physical capacity of the Internet by 2010.”

-- Jim Cicconi, VP AT&T

“High-definition video is the Humvee of broadband, guzzling five times as much capacity as regular video. Once high definition video takes off, bandwidth consumption, now at a record high, could blow into the stratosphere.”

-- Phillipe Morin, VP Nortel

Key Drivers – (2)

- “The Net Generation” -- 100 million Americans born after 1977
 - Computer and gadget literate
 - Grew up with Internet
 - Used to multi-tasking (homework + TV + music + chatting w/20 friends)
 - Ethic of openness, collaboration, sharing
 - High level of web-based interactivity (e.g. MySpace, FaceBook, Flickr, YouTube, etc.)
 - Love to combine, remix media (e.g., Anime + music)
 - Multi-cultural, international
 - Use Internet more than TV, particularly for news

What the Leading Asian Nations Are Doing

- Japan
 - Fastest, cheapest broadband in the world today
 - Competition today at 1 Gbps, 10 Gbps by 2010
 - FTTH: 36% adoption, 85% availability today, 90% availability by 2010
 - “u-Japan” by 2010
- South Korea – right behind Japan
- China -- #1 in broadband users; ADSL to FTTH
- Hong Kong – already at 1 Gbps
- Singapore – 1Gbps to 50% by 2012, 100% by 2015
- Taiwan – rapidly heading to 100 Mbps

What the Leading European Nations Are Doing

- **European Union** – Now exceeds US in broadband lines
- **Sweden**
 - Near 100% availability of broadband
 - Key to success so far: Huge investments in municipal networks, national backbone, tax incentives to employers to spur distribution of computers
 - FTTH: currently #1 in Europe at 7.1%; about to explode with TeliaSonera committing to FTTH
- **France**
 - Nat'l gov't offers 70% grants municipal networks; *plus* low interest loans available from government pension funds
 - Intense competition among three providers => can get 100 Mbps + phone + video in Paris for ~ \$45/month
 - France spurring fiber rollout by opening wiring in apartments

What the Leading European Nations Are Doing (2)

- **Netherlands**
 - Several major city-wide FTTH projects under way, led primarily by municipalities, including Amsterdam
- **Norway**
 - The national utility company is developing an ambitious FTTH project more than 2 million households
- **Italy**
 - Planning a massive € 6.5 billion modernization with goal of providing 65% of Italian households up to 100 Mbit/s by 2012
- **United Kingdom**
 - British Telecom's structurally-separated access provider, Openreach, has just completed its first FTTH project

High Bandwidth Strategies US Providers

- Verizon “FiOS”
 - FTTH/B (BPON => GPON) : Capacity 100 Mbps +
 - Goal: Pass 18 Million homes by 2010 (NYC by 2014)
 - Today: Suburban donuts in parts of 16 states
 - Expensive higher tiers
- AT&T “U-Verse”
 - FTTN (ADSL2+) = Capacity 20-24 Mbps down/1-3 Mbps up
 - AT&T limits broadband to 6-10 Mbps down
 - Today: parts of 22 states
 - Goal: Pass 30 Million homes by 2010

High Bandwidth Strategies of US Providers (2)

- Qwest

- FTTN (ADSL2+) = Capacity 20-24 Mbps down / 1-3 Mbps up
- “Titanium Connect” -- 12 Mbps down / 768 up @ \$46.99
- “Quantum Connect” -- 20 Mbps down / 768 up @ \$99.99
- FTTN Today: negligible
- Goal: 23 major cities in 10 states

- Comcast

- “DOCSIS 3.0” = Max. Capacity 160 Mbps down / 120 Mbps up
[BUT capacity must be shared; in US, 250-2000 homes/node]
- Today: Twin Cities 50 Mbps down / 5 Mbps up @ \$149.50
- Goal : “up to” 20% territory by 2008-09; 100% by 2010
- Eventually: 100 Mbps

High Bandwidth Strategies of Major Providers (3)

- Other Major Cable Operators in no hurry to deploy DOCSIS 3.0
 - If not competing against Verizon or another FTTH provider, little incentive to invest in DOCSIS 3.0
 - Risk of cannibalizing cableco revenue from TV and content
 - Cableco's don't benefit from socially beneficial uses – just more headaches, congestion
- *Wall Street Journal*: “For consumers not served by Comcast or Verizon, speeds [of 50 Mbps or more] may be a long time off.”

Public FTTH Systems

- Render Vanderslice & Associates
 - 44 municipal FTTH systems on stream or under development
 - Paved the way for private sector
 - High take rates
 - Contribute to community well-being in many ways, particularly economic development

“CONCLUSION: Municipal FTTH Systems are an important element of national FTTH deployment and should be encouraged.”

<http://tinyurl.com/4t9gca>

Public Entities Reporting Plants Locating In Part Because of FTTH

Public Entity	Plant(s)
Bristol, TN	Media General
Bristol, VA	Northrup Grumman, CGI
Chelan County, WA	Yahoo
Douglas County, WA	Sabey Corporation
Grant County, WA	Microsoft, Ask Jeeves, Intuit
Independence, OR	Various metal fabrication companies
Kutztown, PA	Various film production companies
Lafayette, LA	Nucomm International
Mason County, WA	Louisville Slugger, Sims, various high technology and online engineering firms
Morristown, TN	Colgate Palmolive
Windom, MN	Various trucking companies
	Source: FTTH Council

Washington

- “High speed” lines: 2,481,567 14th FCC: 6/30/07
- Fiber lines: 19,849 7th FCC: 6/30/07
- Median ↓ speed: 2.18 Mbps 18th CWA: 5/31/07
- Median ↑ speed: 376 kbps 38th CWA: 5/31/07
- Washington on ITIF 2007 New Economy Index
 - Knowledge jobs: 9th
 - Globalization: 1st
 - Economic Dynamism: 6th
 - **Digital Economy: 3rd (Broadband 11th)**
 - Innovation Capacity: 9th
 - Overall: 4th

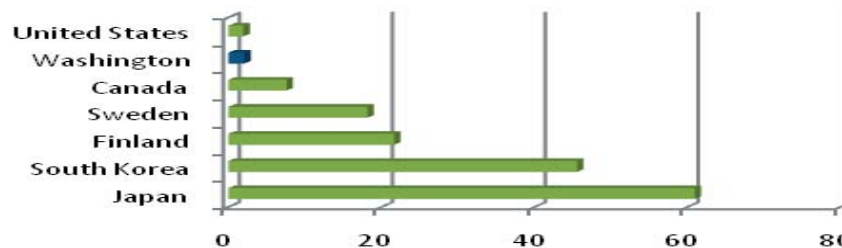
Washington Internet Speed Test

Location	Median Download Speed (megabits per second)
Japan	61.00
South Korea	45.60
Finland	21.70
Sweden	18.20
Canada	7.60
Washington	2.18
United States	1.97

International data from the Information Technology and Innovation Foundation. U.S. data from speedmatters.org test results. Most test participants had DSL or cable modem connections.

Washington Quick Stats

Median Download Speed (megabits per second)



The median upload speed in Washington is 362 kbps, about 7 times slower than in Japan.

State	% <256 Kbps	Q4 07 Change
1 Washington	21%	+151%
2 Virginia	18%	-0.4%
3 District Of Columbia	17%	+4.5%
4 Georgia	15%	+9.2%
5 Illinois	15%	+9.5%
6 Texas	13%	+6.3%
7 Alaska	11%	-8.9%
8 Iowa	10%	-2.9%
9 Montana	8.6%	-6.3%
10 Colorado	8.2%	-4.1%

Is Municipal Wireless Dead?

Opponents

- EarthLink and others in big markets are backing out
- Cost and time-to-market higher than expected
- Take-rates lower than projected for paid services
- Private sector is improving services, dropping rates
- Wireless has insufficient bandwidth for today, future
- Won't penetrate to interiors

Supporters

- Media overreacting – again
- Only “free lunch” models failing
- For most localities, “free lunch” was never an option
- Key drivers still there
- “Anchor tenancy” to reduce risks – e.g., Minneapolis succeeding
- Ways exist to increase take-rates
- For some localities, wireless is the only option, or a key option
- Some consultants advise focusing solely on municipal uses

Thanks!