Framework for Analysis of Broadband Policies: Learnings from Several Countries

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Ofcom

Delivering super-fast broadband in the UK

Promoting investment and competition

Statement Publication date: 3 March 2009

FCC Federal Communications Commission

The role for public sector intervention in next generation broadband

By The Broadband Stakeholder Group (BSG) in Industry (Industry+government group

Posted in Digital divide, Next generation broadband on December 4, 2008 at 11:22 am

Efforts- USA

Source: www.broadband.gov

Efforts- USA

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Long Lines for the iPad and Staying Ahead of the Curve

April 2nd, 2010 by Phil Bellaria - Director, Scenario Planning, Omnibus Broadband Initiative

By Phil Bellaria – Director, Scenario Planning, Omnibus Broadband Initiative and John Leibovitz – Deputy Chief, Wireless Telecommunications Bureau

With lines expected to go out the doors of Apple stores nationwide when the iPad is released tomorrow, it's a good time to think about the changing ways Americans are accessing broadband. More and more, it seems Americans don't want to be tethered to a desktop computer -- or even a laptop -- but want a light mobile device they can curl up on the sofa with to watch an on-line movie, stow in a backpack for subway reading, or pass around the office with the latest vacation pictures. The broadband connections that enable this flexibility are wireless – a fact that points out the need for more spectrum for mobile broadband that we identified in the National Broadband Plan.

Many iPads will rely solely on Wi-Fi to connect to broadband, and the Plan recognizes how Wi-Fi broadband access on unlicensed spectrum can relieve the growing pressure on licensed cellular networks. The Plan calls for the FCC to free up a new, contiguous nationwide band of spectrum for unlicensed use over the next ten years. These bands have the added benefit of providing economical broadband access in rural areas that aren't well served now.

Other consumers will buy iPads configured to also connect to AT&T's commercial licensed networks, adding to the fast-growing volume of data traffic that has already been fueled by smart phones, like the iPad's little brother, the iPhone, and laptop aircards. The growth is exciting – and a call for action to stave off network congestion. Consider this: AT&T's data traffic has grown by 5000% over the past three years. Cisco estimates that smartphones alone can generate 30 times more data traffic than a basic feature phone. And laptops can generate many times the traffic of a smartphone.

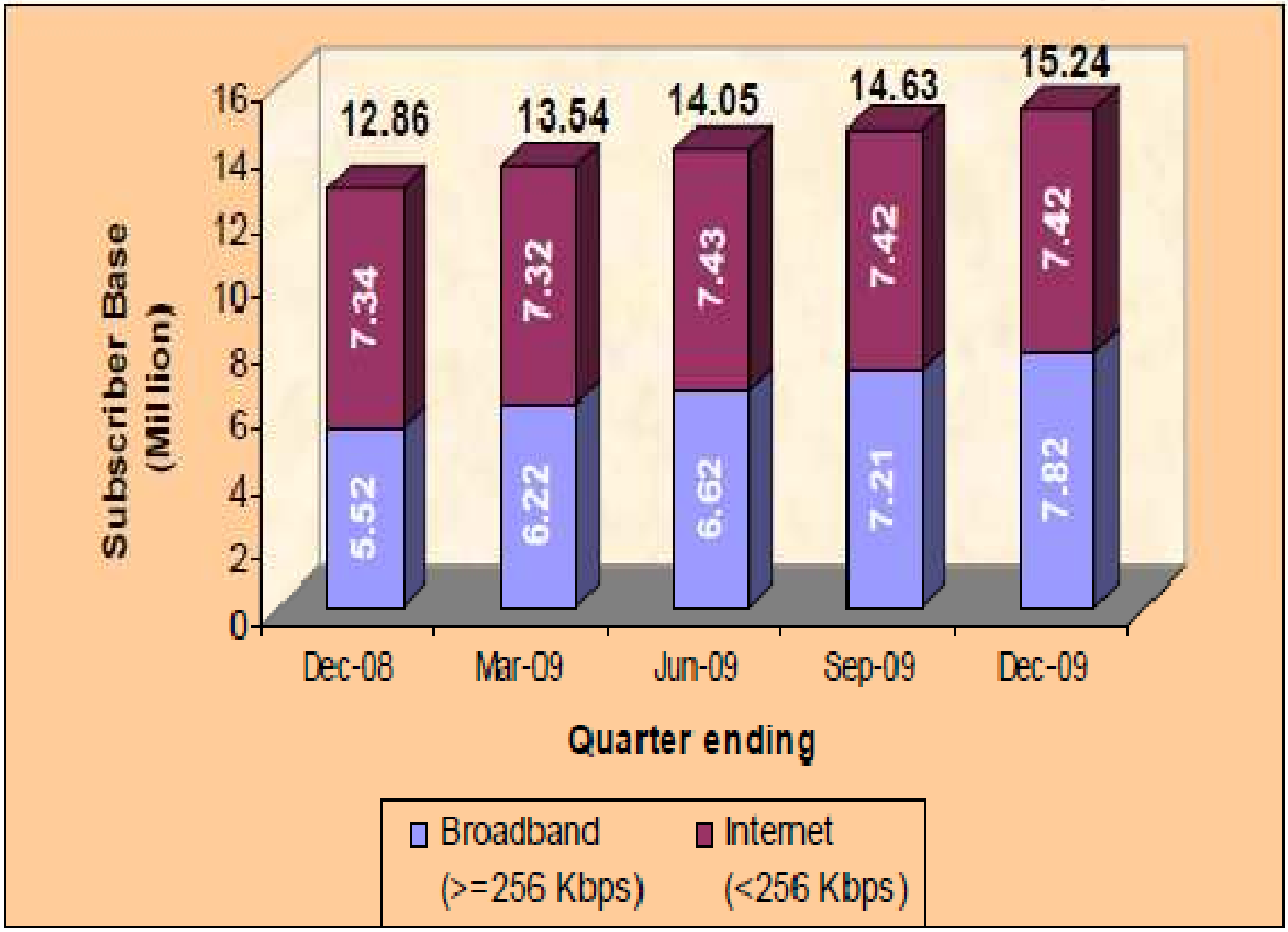
Source: blog.broadband.gov/?categoryId=13847

FCC Initiatives

- Enacting policies to foster competition
- Freeing up more spectrum
- Lowering infrastructure costs
- Investing directly through research and development

Policy Initiatives

- TRAI Consultation on “Broadband Growth in India”- Nov 2nd, 2003
- DOT Broadband Policy 2004 –Targets unmet
- Allocation and Pricing of spectrum for 3G and broadband wireless access services- September 27th, 2006
- Terms and conditions of resale in international private leased circuits (IPCL) segment – March 23rd, 2007
- Improvement in the effectiveness of National Internet Exchange of India (NIXI)- April 20th, 2007
- Accelerating growth of internet and broadband penetration- January 2nd, 2008


Subscriber Base (Million)
16
14
12
10
8
6
4
2
0
12.86
13.54
14.05
14.63
15.24
7.34
7.32
7.43
7.42
7.42
5.52
6.22
6.62
7.21
7.82
Dec-08
Mar-09
Jun-09
Sep-09
Dec-09
Quarter ending
Broadband (>=256 Kbps)
Internet (<256 Kbps)

Current Status of Broadband Deployment

Region	Broadband subscribers (million)	Penetration (per 100 inhabitants)	Wireless broadband (per 100 inhabitants)	Wireline broadband (per 100 inhabitants)
East Asia & Pacific	381.4	17.8	9.7	8.1
East Europe & Central Asia	49.2	12.4	5.3	7.1
European Union (EU-27)	294.1	60.5	36.5	24.0
Latin America & Caribbean	52.4	9.2	3.4	5.7
Middle East & North Africa	27.8	7.6	5.1	2.5
North America	210.9	62.5	34.0	28.5
South Asia	9.1	0.6	0.1	0.5
Sub-Saharan Africa	15.6	1.9	1.7	0.2
World	**1040.6**	**15.6**	**8.6**	**7**

Source: Building broadband- Strategies and policies for the developing world, Yongsoo Kim, Tim Kelly, and Siddhartha Raja, 2010

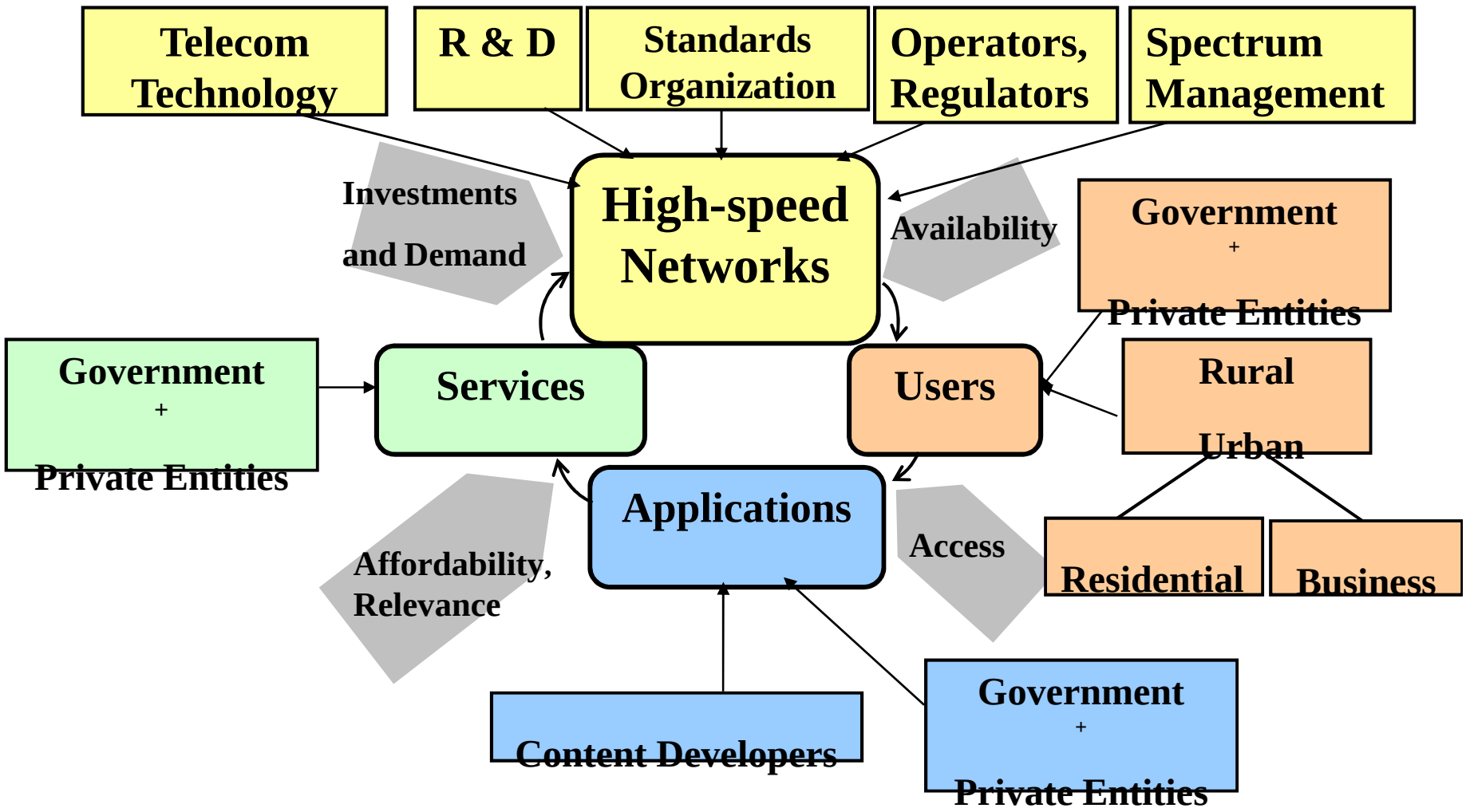
Broadband Penetration

Region	3G/Total Wireless (%)	DSL/Total Mainlines(%)
East Asia & Pacific	18.30	15.10
East Europe & Central Asia	10.10	4.80
European Union (EU-27)	44.30	29.10
Latin America & Caribbean	20.20	4.00
Middle East & North Africa	8.90	6.20
North America	21.00	37.90
South Asia	12.30	0.20
Sub-Saharan Africa	7.90	4.60
World	1040.6	15.6

Broadband connections relative to voice telecommunications connections (percent), December 2008

Source: Building broadband- Strategies and policies for the developing world, Yongsoo Kim, Tim Kelly, and Siddhartha Raja, 2010

Broadband Ecosystem



Source: Building broadband- Strategies and policies for the developing world, Yongsoo Kim, Tim Kelly, and Siddhartha Raja, 2010

Framework for Analysis

- Classification of broadband policies
- Types of institutional mechanisms
- Instruments
  - Financial incentives
    - Tax credits
    - Grants
    - Specific funds
  - Other Incentives
    - Research funding

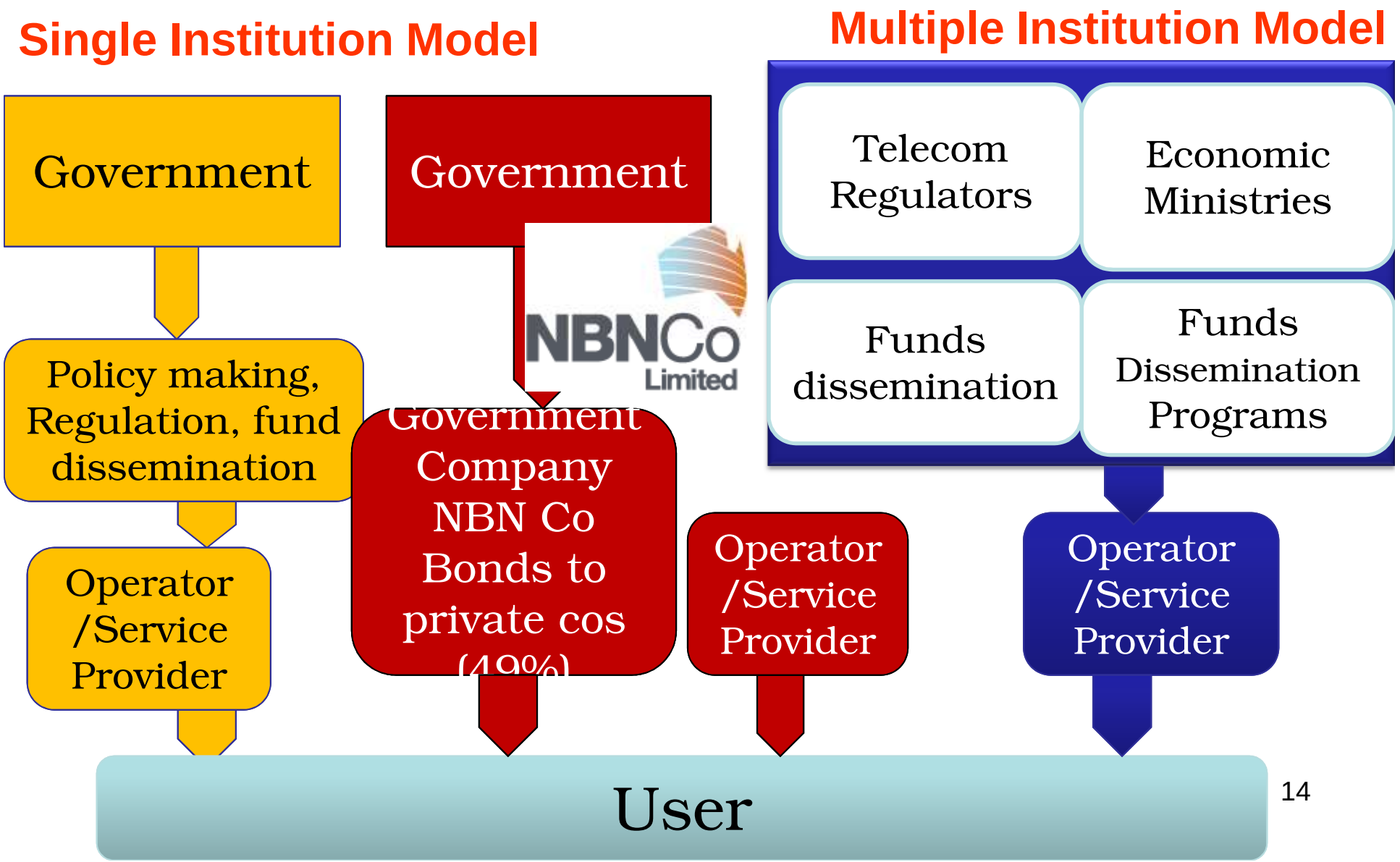
Classification of Broadband Policies

Supply-side	Demand-side
Local loop unbundling as in UK	Awareness campaigns as in Korea, Japan
Government funds, loans, grants on competitive basis as in Canada, Korea, Japan, UK; government incumbent participating in competitive bidding as in New Zealand; subsidies to network builders as in Sweden	Essential Services on web as in Singapore, Korea
Incentives to private sector in form of tax rebates for diffusion in rural/ urban areas as in USA, Japan, Canada, Singapore, Spain	Obligatory access for government processes as in Japan
Open access to incumbent networks as in Korea, Japan	Access at important places like hospitals, schools as in Japan
Pro-competition policies like facility-based competition (Korea), deregulation, little entry barrier, competitive tenders from private players as in Singapore, Australia, New Zealand, USA	Cyber building certification as in Korea
Public-private partnerships as in New Zealand, Japan, Australia, Austria; state owned R&D networks as in USA	Price schemes as in Korea, Japan

Classification of Broadband Policies

- Direct intervention (strongest degree of market interference)
    - (e Japan, e-Europe, funding in rural areas for broadband infrastructure),
    - Tax exemptions for certain kinds of BB usage, e government for content
- Regulation (direct form of market interference)
- Facilitation (no legal consequences for third parties)
    - Support network infrastructure (obtaining ROW, spectrum allocation, role of states and municipalities, civil and road departments (dig once policies)
    - Creation of test beds (Road transport example)
    - R&D
    - Interoperability (mobile banking)

Institutional Mechanisms



Instruments

Financial Instruments

- Tax Credits
  - Vanilla or customized (10% to service providers 5Mbps downlink and 1 Mbps uplink, 20% to NGN 100 Mbps downlink, 20 Mbps uplink and 20% if 3Mbps downlink and 768 kbps in rural/underserved areas.
- Grants (overseen by NTIA)
- Specific Funds eg Informatization fund in Korea, Regional development funds (North Eastern States, India)
- Long term reimbursable loans to operators for deployment of infrastructure in selected areas (Spain, Korea: facility based service providers)
- Funding innovative projects (UK)

Instruments

Other Instruments

- Demand aggregation programs
- State owned research programs
- Research Programs in PPP mode

Research Questions

- Demand Side: Studies on new use divides
- Demand Side: How is lack of standards hampering the growth of advanced mobile services
- Demand Side: Which programs can the government prioritize and actually see them getting implemented? Department of Public Enterprises?
- Studies of evolving market structures and ecosystem (infrastructure, content, services etc)
- What institutional mechanisms will work for different aspects of broadband deployment
  - USOF for broadband
  - Integration across various initiatives of the user departments
  - Management of R&D
  - Impact of tax credits

Research Questions

- Developing an institutional framework for review of spectrum
- Evaluation and measurement studies

Thank You

TRAI Recommendations

Title of consultation paper	Recommendations
Allocation and pricing of spectrum for 3G and broadband wireless access services- September 27th, 2006	I) Government has been requested to allocate 200 MHz of spectrum in 3.2 to 3.4 GHz band to facilitate wireless operation of 12 ISPs in a circle. II) The Authority has recommended that the auction for the 2.1 GHz spectrum should be a simultaneous ascending auction (SAA).

Terms and conditions of Resale in International Private Leased Circuits (IPLC) Segment -March 23rd, 2007

The TRAI's recommendations to the Licensor on the "Terms and Conditions for Introduction of Resale in International Private Leased Circuits (IPLC) Segment" follow:-

I)Provide end-to-end IPLC between India and country of destination for any capacity denomination.

II)Public Switched Telephone Network / Public network not to be connected with IPLC.

III)The resellers to take IPLC from International Long Distance Service Providers (ILDOs) licensed under section 4 of the Indian Telegraph Act, 1885.

IV)Resellers shall be permitted to enter into an arrangement for leased line with Access Providers, National Long Distance Service Providers and International Long Distance Service Providers for provision of IPLC to end consumers.

V)The Resellers can access the subscribers for provision of IPLC only and not for any other purpose.

VI)Resellers should be allowed to sell bandwidth on retail basis with, or, without, value addition to end consumers. Resellers should not sell the bandwidth to other Resellers.

VII)Co-location of the equipment of the resellers at cable landing station should be on the same terms and conditions as may be made applicable from time to time for licensed International Long Distance Operators.

VIII)Resellers should be allowed to create own infrastructure for multiplexing, de-multiplexing, billing system and related to customer management.

IX)License of the Resellers should be for the whole country and not limited to any single service area.

Improvement in the effectiveness of National Internet Exchange of India
NIXI - April 20th, 2007

The initiative would substantially bring down ISP's expenditure on bandwidth, which is likely to reduce content download charges resulting in net reduction in Internet and broadband usage charges.

I)Interconnection of ISPs at NIXI

a.All ISPs or their upstream and multi- homing ISP or International internet bandwidth provider through separate domestic peering link.

b.All the ISPs should be connected at all the 4 nodes of NIXI.

c.Domestic traffic shall be routed through NIXI.

I)Announcement and acceptance of all routes on NIXI

a.All ISPs announce and accept all their routes at NIXI nodes.

b.Provision of stringent penalties.

c.Details of the routes declared and accepted by various ISPs be intimated in advance to NIXI and put on its website.

d.NIXI works out model route announcement code.

I)Segregation of domestic and International traffic

a.All the ISPs who are providing International Internet IP port in India

I)Interconnection of 4 nodes of NIXI

II)NIXI nodes at all state capitals- desirable to make detailed analysis of present domestic traffic, CAPEX and OPEX.

III)Upgradation of NIXI nodes to facilitate implementation of IPv6.

Accelerating Growth of Internet and Broadband Penetration" January 2nd, 2008

Recommendations Accepted by Govt.:

I) Broadband definition, Goals for Internet and broadband subscriber base and penetration.

II) Allowing Internet service provision to multiple distinct customers using VSAT infrastructure suitable amendment to clauses 2.2 (iii) and 2.3 of VSAT License.

III) Streamlining the clearance process from WPC and SACFA.

IV) Waiving off the requirement for SACFA and WPC clearance for receive-only VSAT installation.

V) Waiving off the requirement for SACFA and WPC clearance for DTH installation with Receive Only Internet.

VI) De-licensing of bands 2.4 – 2.48 GHz for low power outdoor use and 5.15 – 5.35 GHz band for the low power indoor use of Wi-Fi systems.

VII) De-licensing of 5.725-5.85 GHz band to facilitate deployment of Wireless access for broadband.

VIII) Allowing provision of Internet services via DTH platform.

Definition

- Definition varies across countries
- ITU defines Broadband as **"Transmission capacity that is faster than primary rate Integrated Services Digital Network (ISDN) at 1.5 or 2.0 Megabits per second (Mbits)"**
- Wireless Broadband: **Technology that enables high-speed wireless transmission of data. Some of the technologies used are wireless LAN, mobile broadband, satellite broadband. The data transfer speeds may vary from 25 Mbps to 155 Mbps depending on technology**
- Mobile Broadband: **Name used to describe various types of wireless high-speed internet access through a portable modem, telephone or other device. Various network standards may be used, such as GPRS, 3G, WiMAX, LTE, Flash-OFDMA, IPW, iBurst UMTS/HSPA, EV-DO and some portable satellite-based systems.**

- Short range Protocols: Ultra wide band, NFC, ZigBEE, Bluetooth
- Longer range protocols: WiMax, FlashOFDM 3G enhancements (UMTS TDD)
- Mesh and ad hoc networking