



## **8<sup>th</sup> Global Symposium for Regulators (Pattaya, 2008)**

### *Six Degrees of Sharing: Innovative Infrastructure Sharing and Open Access Strategies to Promote Affordable Access for All*

## **Presentations**

This PDF is provided by the International Telecommunication Union (ITU) Library & Archives Service from an officially produced electronic file.

Ce PDF a été élaboré par le Service de la bibliothèque et des archives de l'Union internationale des télécommunications (UIT) à partir d'une publication officielle sous forme électronique.

Este documento PDF lo facilita el Servicio de Biblioteca y Archivos de la Unión Internacional de Telecomunicaciones (UIT) a partir de un archivo electrónico producido oficialmente.

یجر ی نورکتلا فملنم تذخوما ی هو ت اظوفحموال ٲمکتبال قسم ، (ITU) للاتصالات الدولي الاتحاد من مقدمة PDF ینسق النسخة هذه ٲامیرسٲ ٲعداده.

本PDF版本由国际电信联盟（ITU）图书馆和档案服务室提供。来源为正式出版的电子文件。

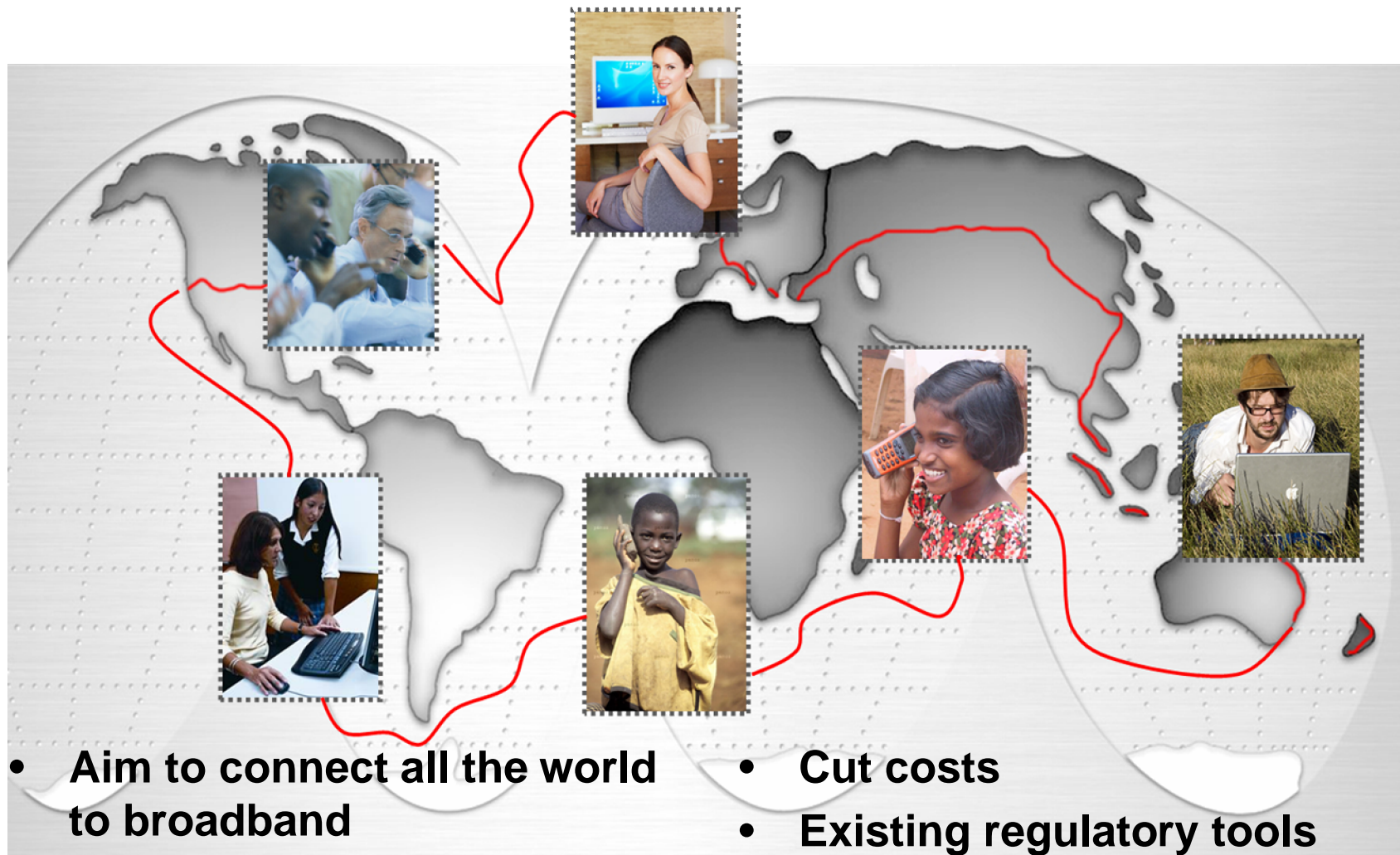
Настоящий файл в формате PDF предоставлен библиотечно-архивной службой Международного союза электросвязи (МСЭ) на основе официально созданного электронного файла.



GSR 08: Session 1  
**What do we mean by  
'6 Degrees of  
Sharing'?**

**Susan Schorr**  
**ITU BDT**  
**Regulatory and Market**  
**Environment Division**

# Inspired by '6 Degrees of Separation'



- Aim to connect all the world to broadband
- Competitive framework
- Cut costs
- Existing regulatory tools

Photo source: ITU, Panos, Flickr

# Why Share



- Cost single biggest reason to share
- Developing countries seek to leverage mobile infrastructure boom into mobile broadband boom
- Developing countries also seek to build IP-based backbone and backhaul networks
- Developed countries seek to leverage fixed line investments and upgrade to Fibre to home, building or curb
- Both share the same goal: to expand network deployment and development by cutting costs

## How to Share



- Share some infrastructure but still compete on services
- Requires political will and clear regulatory framework
- Many of the regulatory tools already exist in interconnection and competition frameworks
- Can apply principles like site sharing, collocation, connection services to mobile, fibre and international gateway facilities





## Time is Right

- For many developing countries, end of exclusivity periods
- A second wave of regulatory reforms could be unleashed
- Sharing strategies could be central to the second wave of regulatory reform
- Results could be phenomenal



# 6 degrees

## What it is:

- ✓ Using infrastructure sharing together with Universal Access strategies within a competitive framework
- ✓ Reducing costs
- ✓ Allow new players to provide broadband
- ✓ Relying on time-tested competition principles
- ✓ About allowing markets to work
- ✓ Consumers getting service

## What it's not:

- ✗ An attempt to put infrastructure back in the hands of monopoly providers or to stifle competition (Sharing's not possible if there's only one player!)
- ✗ A strategy to lessen competition or to sell less equipment
- ✗ About markets not working
- ✗ Limiting consumer choices
- ✗ A limit on facilities-based competition

## Different degrees of sharing or flip sides of the same coin?

- From basic interconnection regulation to local loop unbundling to functional separation?
- Functional separation versus open access?
- Adapting practices designed for different goals, e.g. tower sharing for environmental goals for universal access goals



International Telecommunication Union

# GSR 2008

Discussion  
Paper

Comments are welcome and should be sent by 13 April 2008 to [GSR08@itu.int](mailto:GSR08@itu.int)



International  
Telecommunication  
Union



**Thank you!**

[susan.schorr@itu.int](mailto:susan.schorr@itu.int)

[www.itu.int/gsr08](http://www.itu.int/gsr08)

# GSR 2008

Discussion  
Paper

Comments are welcome and should be sent by 13 April 2008 to [GSR08@itu.int](mailto:GSR08@itu.int)



## Session 1

# Infrastructure sharing: some practical responses

Russell Southwood, CEO

Balancing Act

[www.balancingact-africa.com](http://www.balancingact-africa.com)

# Overcoming market blockages



- ✓ What is “the prize” for developing countries that build high-capacity networks?
- ✓ Obstacles to achieving the prize
- ✓ Bottleneck facilities, trust and investment issues and the changing role of the incumbent
- ✓ Civil war legacy issues and responsibilities
- ✓ Un-served or under-serviced areas
- ✓ The policy objective is to speed up delivery of “the prize”

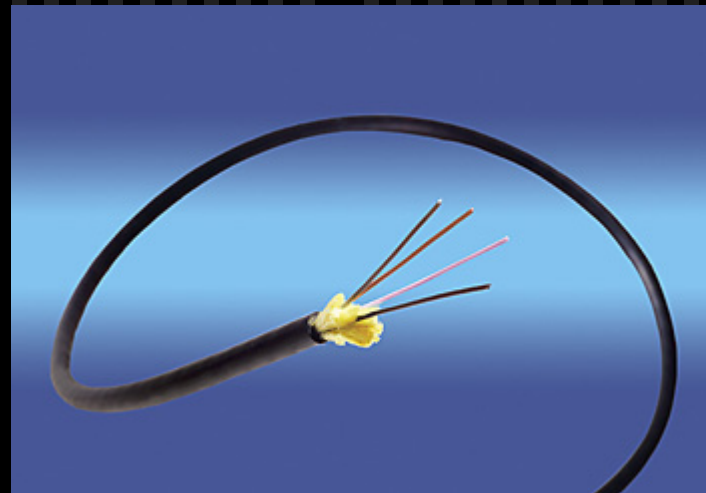
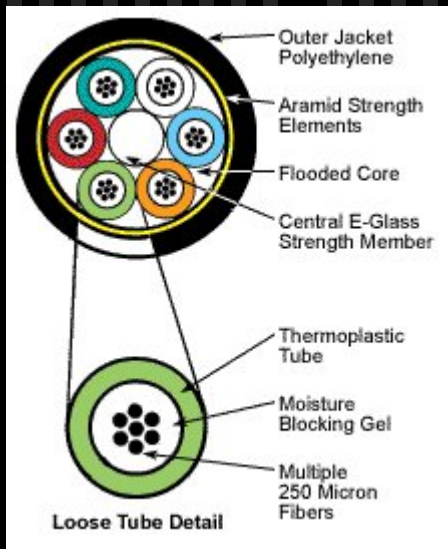
# Practical responses?



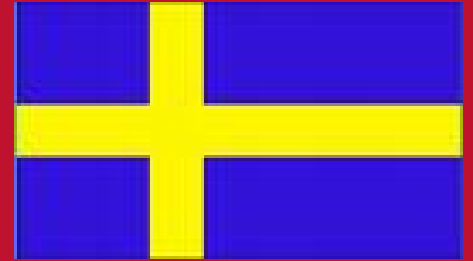
- ✓ Strategic or tactical? Government there for the long run or out once things are in place?
- ✓ What might private public partnership mean?
- ✓ National infracos? Functional separation?
- ✓ JVs to share major build-outs?
- ✓ Facilitating rights of way/duct sharing?
- ✓ Sharing through equipment vendors?
- ✓ Greenfield operators?

# What's a Fiber Network?

- ✓ MBC Installed highly advanced single mode fiber cable (SMF-28E)
- ✓ 24 strands minimum to all industrial parks
- ✓ Strands connect to one or two MBC Nodes



# Example 1:



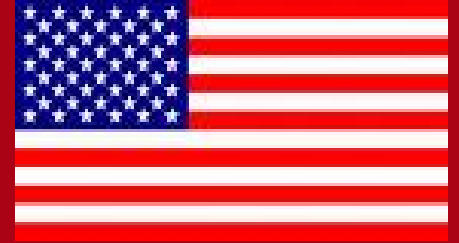
✓ Stockab, Sweden



**Duct sharing**



# Example 2:



## ✓ Mid-Atlantic Broadband Co-operative, USA



**Co-located access points**

# Example 3:



✓ SERPANT, Ireland



**Trenches**

# GSR 2008

Discussion  
Paper

Comments are welcome and should be sent by 13 April 2008 to [GSR08@itu.int](mailto:GSR08@itu.int)



- ✓ Any questions?
- ✓ Russell Southwood
- ✓ [Info@balancingact-africa.com](mailto:Info@balancingact-africa.com)

[www.itu.int/gsr08](http://www.itu.int/gsr08)

# GSR 2008

## Discussion Paper

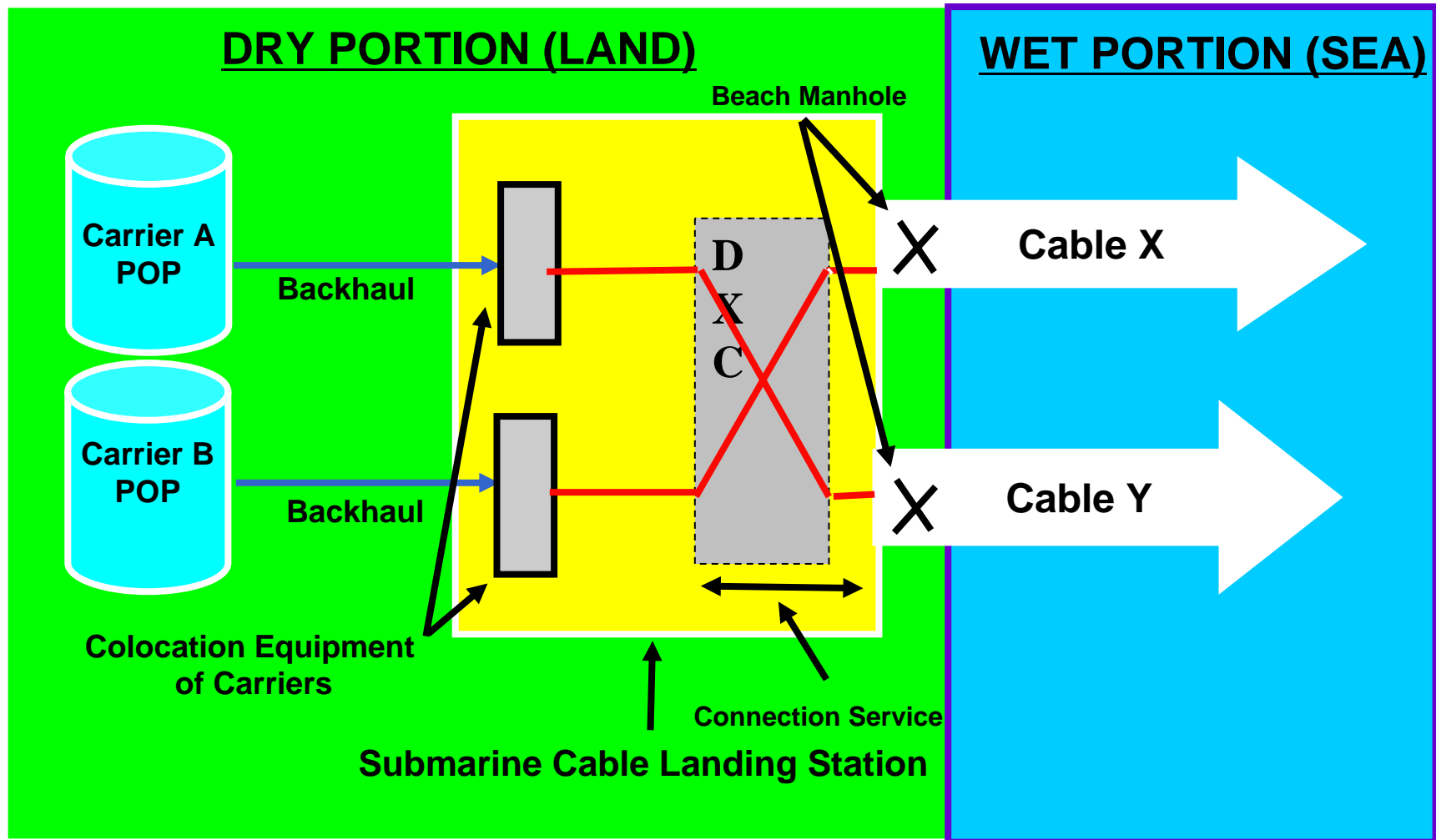
Comments are welcome and should be sent by 13 April 2008 to [GSR08@itu.int](mailto:GSR08@itu.int)



## GSR 08: Session 2 **INTERNATIONAL GATEWAY LIBERALIZATION: SINGAPORE'S EXPERIENCE**

**Muhammad Hanafiah  
Abdul Rashid**  
Director (International),  
Infocomm Development  
Authority of Singapore

# Schematic of Submarine Cable System





# IDA's Methodology for Making Regulation

- > **Determine desired policy/regulatory Outcomes**
- > **Apply IDA's Regulatory Principles throughout (Transparency, Non-discrimination, Timeliness, etc)**
- > **Consult interested parties/stakeholders (including research on domestic and international practices)**
- > **Address concerns and analyze findings**
- > **Make preliminary recommendations**
- > **Consult interested parties on preliminary recommendations**
- > **Make decision, explain the reasons behind the decision**
- > **Implement decision (ensure legislation, enough resources, training)**
- > **Monitor that policy/regulatory objectives are being met. If not, take corrective action**
- > **Review regulation after 2-3 years**



# Step One

## > Determine desired regulatory/policy outcomes:

- Vibrant international market, with multiple players landing in Singapore
- Substantial increase in Singapore's international bandwidth capacity
- Significant drops in IPLC rates (International Private Leased Circuits) and IDD rates

# Step Two

## > Establish the Reference Interconnection Offer (RIO)

- Dominant Licensee must provide a Reference Interconnection Offer to its competitors.
- Sets out in transparent manner: IDA-approved prices, terms and conditions for telecom operators to colocate equipment and access the incumbent's SCLS.
- Reduces timeframe for interconnection negotiations and expedites market entry

## Step Three

- > **Allow and encourage other submarine cable landing stations (SCLS) in Singapore.**
  - **Four operational SCLS in Singapore currently**

## Step Four

- > **Allow and encourage competing operators to build backhaul from submarine cable landing stations to the operators' points of presence.**

# Step Five

- > **Mandate colocation at Dominant Licensee's SCLS**
  - **Dominant licensee must allow any operator who owns capacity in a submarine cable system landed at Dominant Licensee's SCLS to obtain colocation space.**

# Step Six

## > Mandate Connection Services

- **Connection Services found to be a bottleneck.**
- **Required Dominant Licensee to provide Connection Services under the RIO and at prices that are cost-based and determined by IDA using FLEC/LRAIC methodology.**



# Step Seven

- > **Allow operators to provide to any third party backhaul service to that third party's capacity on any submarine cable system landing at that SCLS, and to provide transit service to enable a third party to transit traffic between submarine cable systems landing in Singapore.**
  - This is irrespective of whether the operator owns capacity in the submarine cable system which it seeks to provide backhaul and transit services

# Step Eight

- > **Establish a one-stop shop to facilitate submarine cable landings**
  - Landing of cables require close coordination with multiple government agencies (URA, MPA, SLA). IDA facilitates the process as a “one-stop point” to interface with all relevant agencies.
  - Involves guiding licensees on steps and processes necessary to land the cables so as to reduce administrative inconvenience.
  - Role of coordinator to resolve any issues that arise from licensee’ application.

# Impact

<b>Total Submarine Cable Bandwidth Capacity</b>	<b>53Gbps (1999) to 28,000 Gbps (2007)</b>
<b>IPLC Rates (International Private Leased Circuits)</b>	<b>Dropped &gt;90%</b>
<b>IDD Rates</b>	<b>Dropped &gt;90%</b>
<b>No of Outgoing International Telephone Minutes per month</b>	<b>64 million (1999) to 581 million (2007)</b>
<b>No of ISPs</b>	<b>&gt;10 (1999) to &gt;70 (2007)</b>
<b>Broadband Penetration (Households)</b>	<b>&lt;5% (1999) to 77% (2007)</b>
<b>Revenue of Incumbent</b>	<b>S\$4.4 billion (1997) to S\$13.2 (2007)</b>

# Lessons

- > **IGW competition needs a lot nurturing by regulator in the early days**
- > **There are many potential ‘bottlenecks’ – regulator needs to uncover and address them quickly and effectively**
- > **Consultation with industry is crucial**
- > **Following a consultative rulemaking methodology helps to spot problems early and minimise them**

International Telecommunication Union

# GSR 2008

Discussion  
Paper

Comments are welcome and should be sent by 13 April 2008 to [GSR08@itu.int](mailto:GSR08@itu.int)



**Thank you!**

[Muhd\\_HANAFIAH@ida.gov.sg](mailto:Muhd_HANAFIAH@ida.gov.sg)

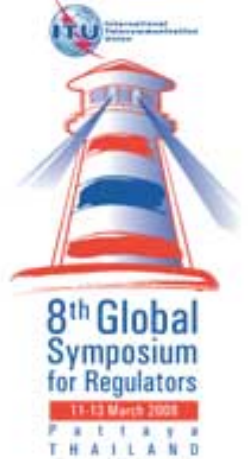
[www.ida.gov.sg](http://www.ida.gov.sg)

[www.itu.int/gsr08](http://www.itu.int/gsr08)

# GSR 2008

Discussion  
Paper

Comments are welcome and should be sent by 13 April 2008 to [GSR08@itu.int](mailto:GSR08@itu.int)



## GSR 08: Session 3

### **Breaking Up is Hard to Do: The Emergence of Functional Separation as a Regulatory Remedy**

**Malcolm Webb**  
**Partner, MGF Webb New  
Zealand**

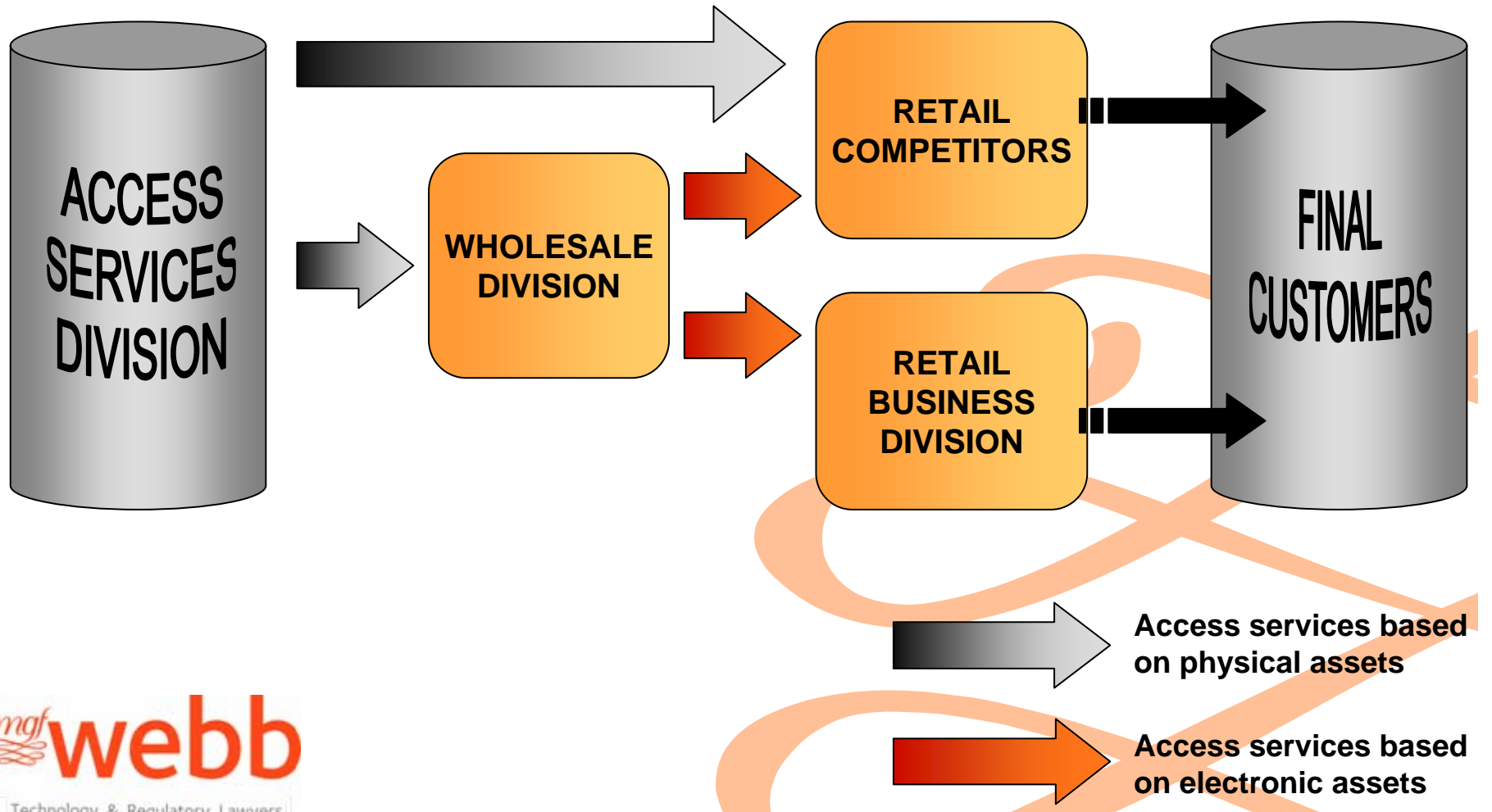


**ACCESS**

**WHOLESALE**

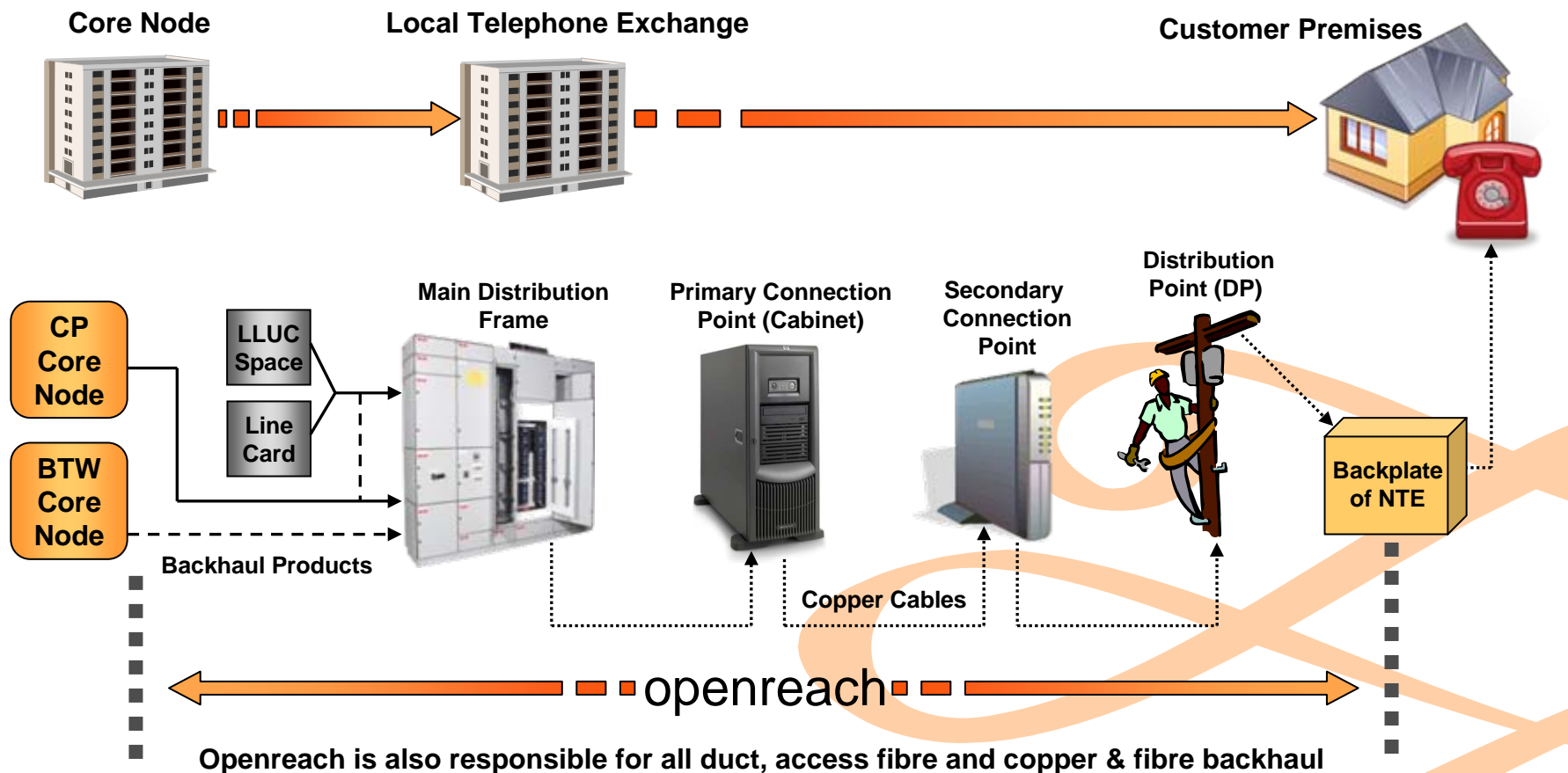
**RETAIL**

**CUSTOMERS**

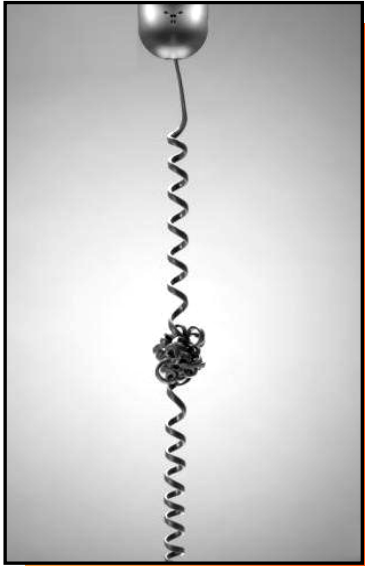


# Openreach: Asset Ownership

## PSTN & ADSL Service



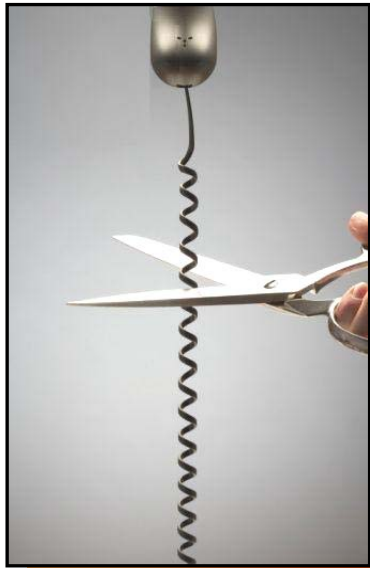
# Reasons for Functional Separation



Discriminatory behaviour by the incumbent – particularly non-price discrimination

Existing remedies may not be effective in controlling discriminatory behaviour

# 3 Key Features of Functional Separation



The “virtual” separation of the incumbent’s business

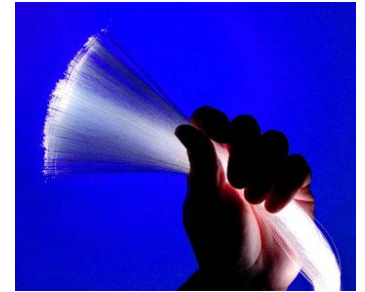
The “equivalence” or “equivalence of inputs” (Eoi) obligation

Monitoring of the incumbent, to ensure compliance with the separation and equivalence obligations, and effective enforcement

# Functional Separation: Key Issues



**Impact on investment incentives**



**Transition to fibre-based next-generation access networks**



**Difficulty in achieving stability in the asset base**

**Service quality**



# Functional Separation in Developing Countries

## Checklist:

**An independent and reasonably competent bureaucracy that can implement separation, monitor compliance and enforce non-compliance**

**A reasonably strong incumbent operator, that can bear the costs and continue to operate effectively**

**A reasonable expectation that the incumbent will be cooperative**



# Alternatives to Functional Separation



**Use blunter regulatory instruments**

**Go straight to structural separation**



International Telecommunication Union

# GSR 2008 Discussion Paper

Comments are welcome and should be sent by 13 April 2008 to [GSR08@itu.int](mailto:GSR08@itu.int)



*mgf* **webb**  
Technology & Regulatory Lawyers



**Thank you!**

[info@mgfwebb.com](mailto:info@mgfwebb.com)

PO Box 105-426

Auckland City

New Zealand

Phone: +64 9 970 4100

Fax: +64 9 970 4102

**[www.itu.int/gsr08](http://www.itu.int/gsr08)**



# GSR 2008

Discussion  
Paper

Comments are welcome and should be sent by 13 April 2008 to [GSR08@itu.int](mailto:GSR08@itu.int)

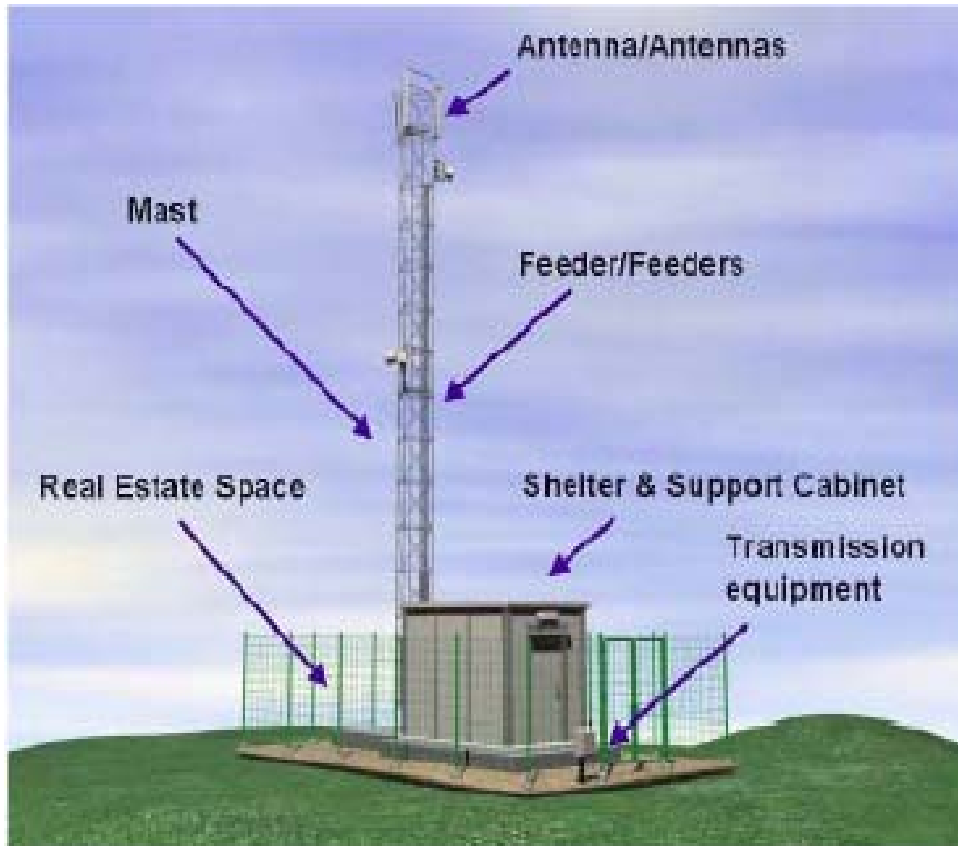


## GSR 08: Session 4

# Mobile Sharing

**Camila Borba-Lefevre**  
Legal Advisor  
Machado, Meyer, Sendacz &  
Opice, São Paulo, Brazil

# *Passive sharing*



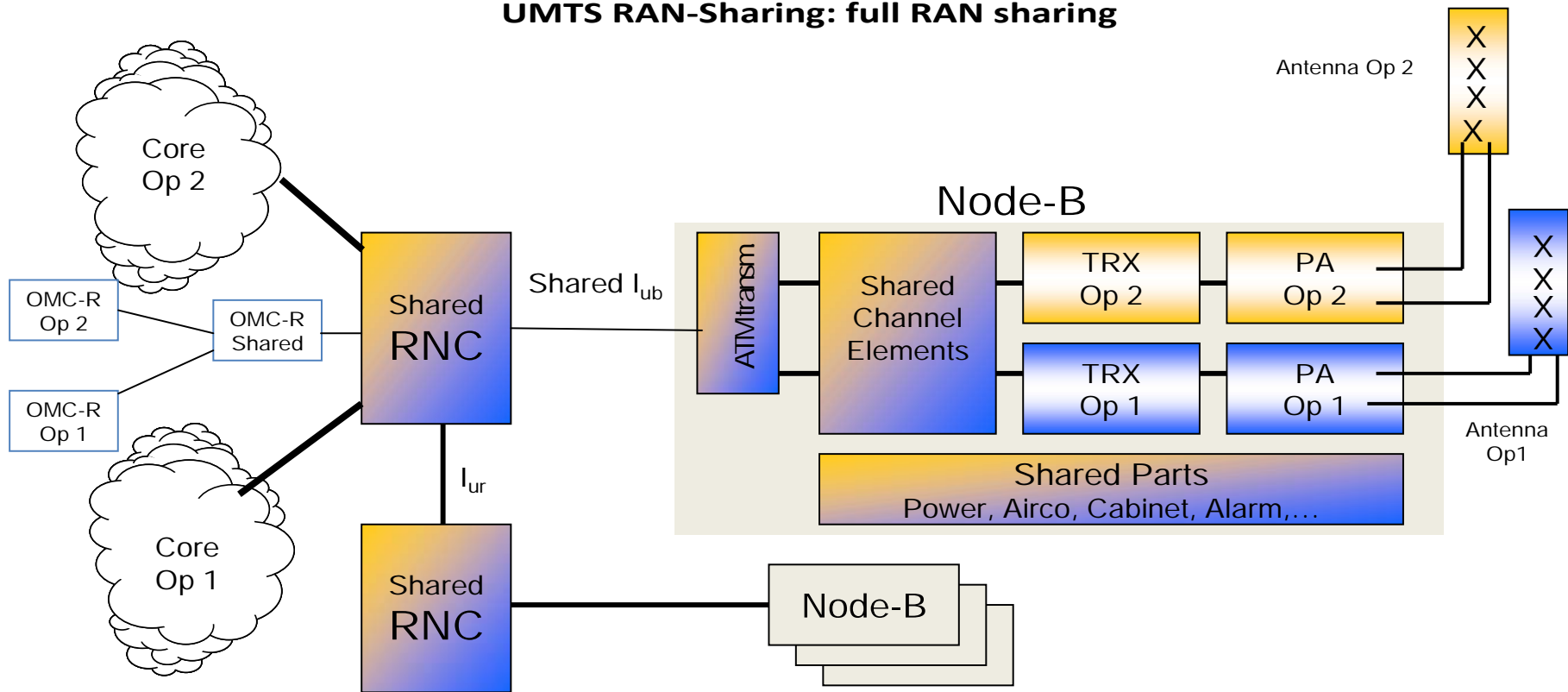
- Physical space
- Masts and pylons
- Cables
- Battery back-up
- Shelter and support cabinet

*Source: Telecom Regulatory Authority of India*

# Active sharing

- RAN Sharing

## UMTS RAN-Sharing: full RAN sharing



## *Other options*

- National roaming / Regional roaming
  - Open access model:
    - MVNO
    - Tower company
  - Functional separation
-

## *Brazil – network sharing small communities*



- Communities with less than 30,000 inhabitants (ca. 4,500)
- 3 licensed operators 3G services
- Each must serve 1/3 communities
- Network may be shared with other 2 operators

## *India – subsidized tower sharing rural and remote areas*



- Infrastructure built with subsidies from USOF
- Areas without coverage
- Towers must be shared

# *Questions*

Universality or competition?

Infrastructure or services?

---



International Telecommunication Union

# GSR 2008

Discussion  
Paper

Comments are welcome and should be sent by 13 April 2008 to [GSR08@itu.int](mailto:GSR08@itu.int)



**Thank you!**

**[clefevre@mmso.com.br](mailto:clefevre@mmso.com.br)**

**Tel.: (5511) 3150.7704**

**Fax: (5511) 3150.7071**

**[www.itu.int/gsr08](http://www.itu.int/gsr08)**

International Telecommunication Union

# GSR 2008

Discussion  
Paper

Comments are welcome and should be sent by 13 April 2008 to [GSR08@itu.int](mailto:GSR08@itu.int)



International  
Telecommunication  
Union



## GSR 08: Session 4 **Spectrum Sharing**

**Adrian Foster**  
**McLean Foster & Co, Canada**

# Topics

- ◆ Spectrum Sharing
- ◆ Framework – Structure, Options and Tools
- ◆ Practical Steps
- ◆ Country Examples



# Spectrum Sharing

- ◆ Spectrum sharing encompasses several techniques – some administrative, technical and market-based. Spectrum can be shared in several dimensions; time, space and geography.
- ◆ Demand for spectrum is increasing and frequency bands (below 1GHz) are becoming more congested especially in densely populated urban centres.
  - Spectrum can be shared in several dimensions; time, space and geography;
  - Diverse approaches to sharing frequencies some administrative, technical and market-based. : inband sharing, leasing and spectrum trading, and use of unlicensed spectrum commons combined with the use of low power radios or advanced radio technologies including ultra-wideband and multi-modal radios.

# Framework

- ◆ International, Regional and National
  - Allocations – Tables of Frequency Allocations
    - ◆ The WRC-07 has made significant strides increasing the amount of spectrum available to broadband services
- ◆ Spectrum management mechanisms include:
  - Command and control
  - Market based
  - Flexible spectrum management
  - Spectrum sharing (Overlay and Underlay)
  - Spectrum commons

# Opportunities and Challenges

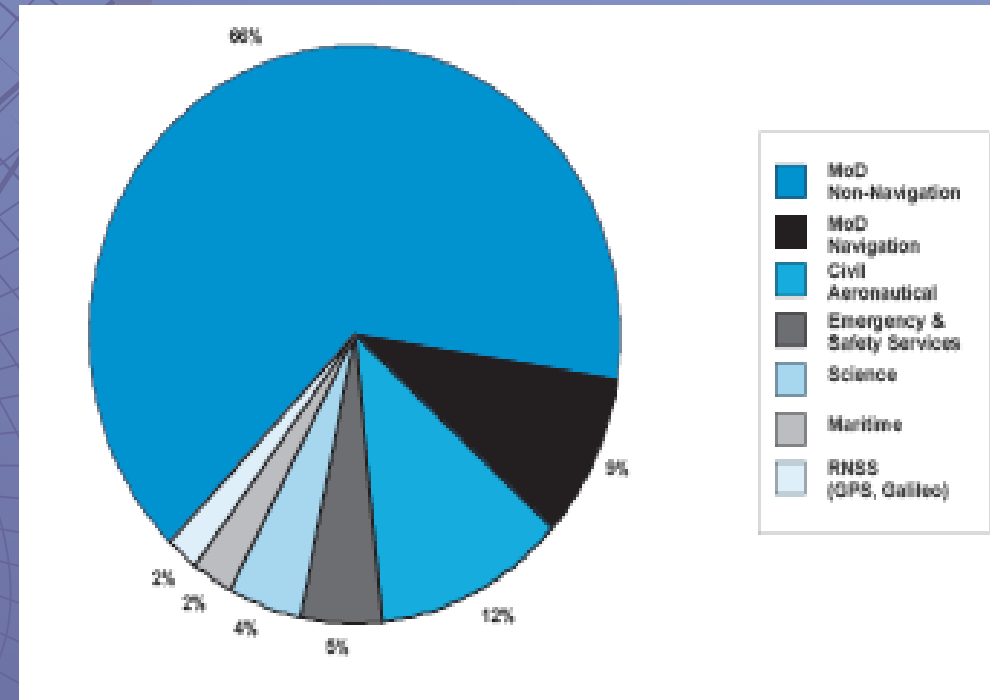
	Opportunities	Challenges
<b>Command and Control</b>	Centrally managed and planned Low risk of interference	Slow Requires managers to make technology choices Suboptimal efficiency
<b>Market Mechanisms</b>	Promotes efficient usage. Gets spectrum to the users who value it most	Possibility of hoarding Windfall gains Fragmentation
<b>Flexible Use</b>	Potentially efficient use of spectrum Prevents artificial scarcity and high values of spectrum	Perceived increased risk of interference Relatively untested
<b>Sharing</b>	More efficient use of spectrum that is already allocated	Requires some management Potential for interference Fragmentation
<b>Commons</b>	Promotes innovation Lower cost of regulation	Potential interference 'Tragedy' of commons Untested (except for short range applications)

Source: Commission for Communication Regulation, 2007



# Spectrum Availability

- ◆ Significant blocks of spectrum are allocated for government use often for military and other ministry communications systems. As reported in the to the UK Gov't in 2005, government holdings of spectrum approximate 50% of the spectrum below 15GHz.
- ◆ The relative share of spectrum between various government services is illustrated .
- ◆ Independent Audit of Spectrum Holdings (the Cave Audit)





# Key Considerations

- ◆ Planning
  - Current and future spectrum uses which bands how and when they should be released, auction for example.
  - Consultation with various stakeholders and with industry fora – ICTA and OFTA WiMax Consultations.
  - At a minimum careful review and understanding of recent decisions at WRC and leading regulatory initiatives.
- ◆ Assessing Demand and Scarcity
  - Developing countries an absence of real scarcity demand for advanced services beginning to emerge serve on the introduction of spectrum sharing policies and assignment practices.
    - ◆ Impact of delay on the economy overall coming from investment and productivity.
    - ◆ Creation of attractive markets for investors who can deploy or utilise advanced services and technologies should not to be ignored by spectrum policy makers.

# Key Considerations

- ◆ Valuing Spectrum
  - Opportunity cost and economic efficiency
  - Special situations for government spectrum
  - Compensation to existing users
- ◆ Market Liquidity
  - Depth and breadth of market - sufficient liquidity to provide participants with a reliable method of transacting.

# Practical Steps

- ◆ Spectrum Use Studies
- ◆ Spectrum Planning
  - Consultation
- ◆ Spectrum Release
- ◆ Spectrum Authorization Reform

# Examples

- ◆ Brazil 2008
  - ANATEL in Brazil issued licenses 4 licenses per licensed area for 3G wireless deployment in the whole country. Operators are allowed to share network components such as towers as well as spectrum in order to provide services in municipalities with less than 30,000 inhabitants.
- ◆ EU 2005
  - The EU now proposes that one-third of the spectrum below 3GHz could have flexible usage rights and be tradable by 2010.
- ◆ Hong Kong 2004-2006
  - Consultations with stakeholders to obtain input on issues related to specific bands for BWA, e.g. 3.5 GHz



# Examples

- ◆ Mauritius 2005-2006
  - ICTA conducted public consultations on proposed BWA frequency band allocations, technical characteristics and regulatory requirements and issued its decisions within 3 months. Those decisions opened the 2.5 GHz band for Mobile and Nomadic BWA (IMT-2000) applications by 2010, the 3.5 GHz band immediately for Fixed BWA and the 5.1-5.3 GHz band for low power in-building applications. In 2006, ICTA additionally opened the 5.4 GHz and 5.8 GHz bands for BWA.
- ◆ Mexico 2005
  - After two years of research, consultation and tests, COFETEL, announced unrestricted bands subject to specifications of technology and of operation that minimize the probabilities of harmful interference in the 902-928, 2400-2483.5, 5.150-5.350 and 5.725-5.850 MHz bands for broadband internet access provisioning.
- ◆ USA 2004
  - The UMTS/HSPDA service in the United States was launched by the end of 2004 strictly using the existing 1900 MHz spectrum sharing the allocation with 2G PCS services.

International Telecommunication Union

# GSR 2008

Discussion  
Paper

Comments are welcome and should be sent by 13 April 2008 to [GSR08@itu.int](mailto:GSR08@itu.int)



**Thank you!**

[adrian.foster@sympatico.ca](mailto:adrian.foster@sympatico.ca)

**Adrian Foster**

**[www.itu.int/gsr08](http://www.itu.int/gsr08)**

# GSR 2008

Discussion  
Paper

Comments are welcome and should be sent by 13 April 2008 to [GSR08@itu.int](mailto:GSR08@itu.int)



## GSR 08: Session 5

### Sharing National Fibre in Developing Countries

**Dr. Tracy Cohen and  
Russell Southwood**

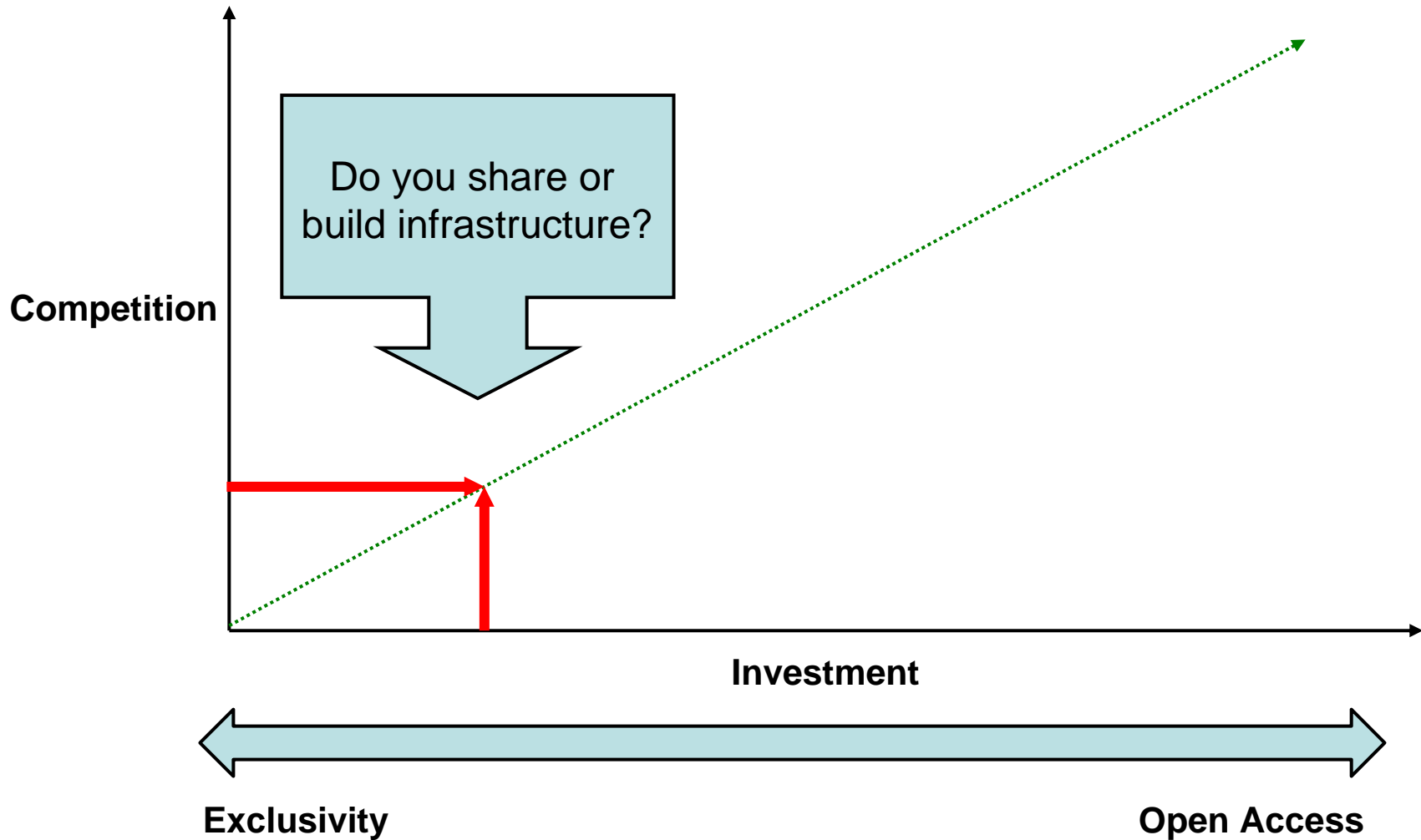
The views expressed in this presentation do not necessarily represent the views of ICASA.



## Assumptions

Communications infrastructure (and specifically broadband) is essential for economic and social development	pp. 7 - 14
Objective is affordable, wide-spread access and coverage	pp. 7 - 36
The key mechanism is competition	pp. 26-36
The key metric is increased investment in infrastructure	pp. 26-30
Sharing will reduce costs of entry	pp. 14-26
These are largely “access regime” and rights of way issues	pp. 14-26
The regulatory tools exist	pp. 30-36
Political will is central	pp. 7 - 36

# The Challenge



# Regulatory Approach

- Informed by different country contexts



- State/privately owned infrastructure wholesaler
- New entrant/Greenfield player
- *Legacy-plus* hybrid (JV, co-operative)
- Non-telecoms infrastructure that allows rights of way access
- Functional/structural separation



- Licensing/authorizations
- Licence fees
- Pricing
- Rate of return
- Creative policy

**Tailor country and policy specific solutions**

## Implementation Considerations

- Political will to bring about conditions for competition
  - clear policy
- Commercial imperative & market outcomes
  - identify critical infrastructure sites
- Incentive creation
  - subsidies, licence fee reduction, exemptions, more spectrum
- Non-discrimination and transparency
  - require publication of infrastructure installations
- Pricing
  - reasonable rate of return

## Implementation Considerations

- Technical feasibility
  - open access network deployment
- Competition framework
  - dominance/Significant Market Power
- Enforcement and dispute resolution
  - service level agreements
  - billing and settlement procedures
  - confidentiality of customer information
- Employ first principles

## Practical Recommendations for Regulators

- Consult
- Licence/authorize/create incentives
- Improve transparency from operators
- Reference sharing offers?
- Mandate access to bottlenecks
- Enable rights of way to reduce costs
  - Mandate sharing
  - RoW sharing cross sectors
- Explore competitive bidding/auctions when licensing municipal or backhaul providers
- Require coordinated trenching/ducting
- Identify critical infrastructure sites

## Other Practical Recommendations

**Government and  
local authorities**



Act as a clearing point for rights of way if multiple agencies/entities involved

Transparency – site surveys and geographic information

Reduce costs

Speed up process

**Industry**



Be creative with sharing

Transparency – publish information on infrastructure installations

Coordinate trenching and ducting works



International Telecommunication Union

# GSR 2008

Discussion  
Paper

Comments are welcome and should be sent by 13 April 2008 to [GSR08@itu.int](mailto:GSR08@itu.int)



**Thank you!**

[tcohen@icasa.org.za](mailto:tcohen@icasa.org.za)

[www.icasa.org.za](http://www.icasa.org.za)

[www.itu.int/gsr08](http://www.itu.int/gsr08)

International Telecommunication Union

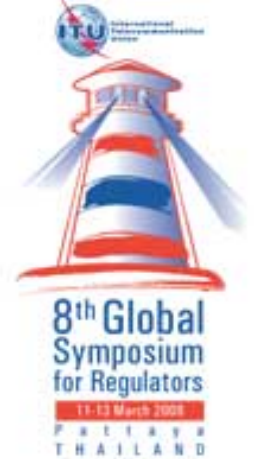
# GSR 2008

Discussion  
Paper

Comments are welcome and should be sent by 13 April 2008 to [GSR08@itu.int](mailto:GSR08@itu.int)



International  
Telecommunication  
Union



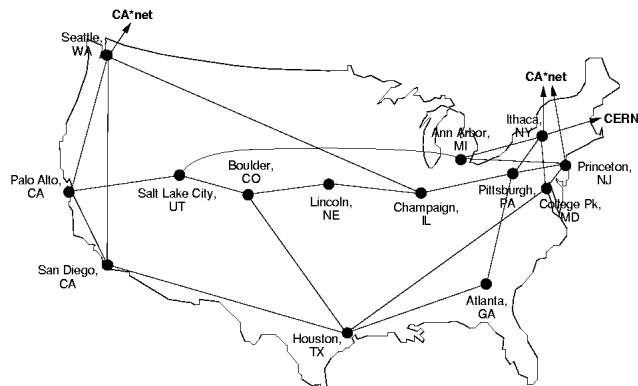
## GSR 08: Session 6 **End-User Sharing**

**Dr. Michael L. Best**  
**Georgia Institute of  
Technology**

# What is End-User Sharing?



NSFNET T1 Network 1991



© Merit Network, Inc.

- End-user sharing: In *usual* operation the end-user is aware of or indeed the application is predicated on sharing something with other end-users.





# Today's End-User Sharing

---



# Phone Sharing

---

## *Taxonomy of Sharing*

- Unmanned phone box
- Village Network Operator (VNO)
- Public Call Office (PCO)
- Village Phone Operator (VPO)
- VoIP telecentre services



# Phone Sharing

---



- Most people today (still) gain phone access via some form of sharing.
- A common *national* sharing rate can be four users per subscriber.





# Phone Sharing (PCO/STD/ISD)

---

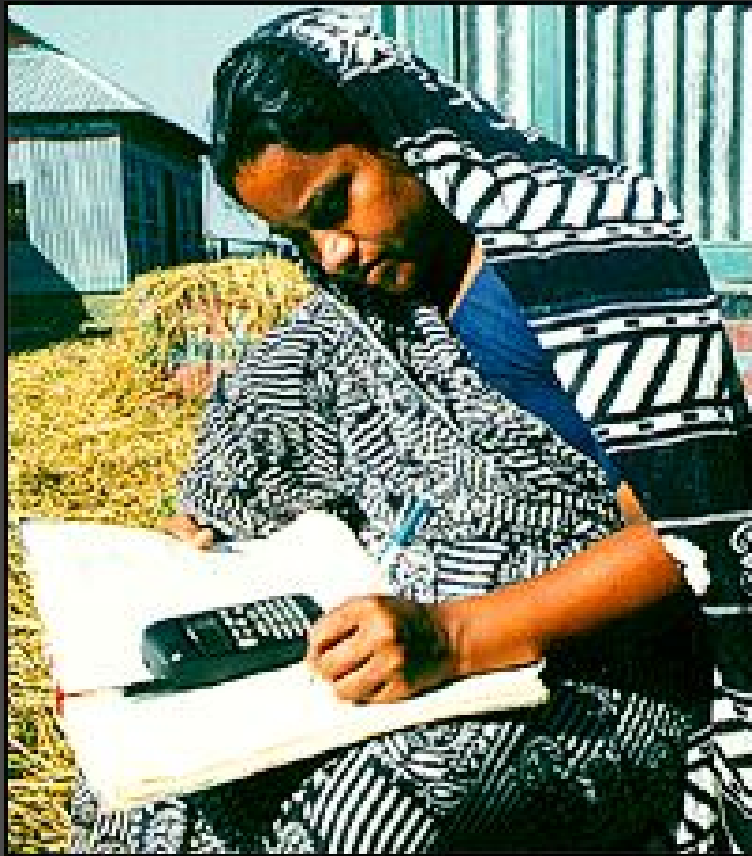
- India's PCO/STD/ISD
  - Millions of facilities nation wide
  - In 92% of villages
  - Key to success: 80/20 revenue sharing





# Phone Sharing (Grameen Phone)

---



- Bangladesh's Grameen Phone
  - Pro-poor: entrepreneur average net income of \$624
  - Pro-poor: use among poor 50% higher than non-poor



# Going Beyond Voice

---

Sharing text, data, incoming voice,  
location, money, handsets ....



# Going Beyond Voice

---



- VPO's experience significant levels of incoming SMS messages destined for others (South Africa study shows eight-to-one).



# Going Beyond Voice


---

**Receive prices  
by SMS**

of agricultural  
products in  
West Africa by  
sending your  
request to :

**+233 2464 99999**

for a list of all available  
codes, visit  
[www.tradenet.biz/codes](http://www.tradenet.biz/codes)



The image shows a woman in traditional African attire holding a mobile phone. In the background, there are two computer monitors. The left monitor displays 'SELL MAW 45KG 35NGN'. The right monitor displays 'OFFER TO SELL: maize (white); 45kg: 35NGN. Contact: Okoro'.

- Agricultural information services
  - E.g. Manobi (Senegal), SHEMP (Zambia), Tradenet (pan-Africa)
  - Provide farm prices, trading options, input sourcing....
  - Removes the middleman



# Going Beyond Voice

---

- M-commerce
  - E.g. GCash (Philippines), M-PESA (Kenya), WIZZIT (South Africa)
  - Provide for unbanked, savings, funds transfer, remittances, PoS purchases....



# Going Beyond Voice

---

- Advanced (*mobile 2.0*) sharing
  - E.g. Dodgeball, Jaiku, Twitter, FireEagle, SLAM, Myspace, Orkut, Facebook ....
  - Share location-based services, picture and other rich media sharing, social networking....





# The Role for Regulators

---

- Low-barriers to entry for entrepreneurial sharing
- Revenue sharing terms critical
- Entrepreneur training significant
- Think well beyond outgoing voice
  - Incoming voice, text, data, money, location...
- Sharing always comes with security & privacy issues



# Computer Sharing

---



- Telecentres provide common means of sharing: Equipment, network, expertise, community.
- Broad range based on: Location, service bundle, organizational model.



# Computer Sharing (*Infocentros*)

---



- Coordinated by Chilean regulator (SUBTEL)
- Provide “a public community facility with ICT capabilities and communication to access and/or generate content and services relevant to the community in which it is located”
- **Over 700 centers, 1 million users, 4000 computers**



# Computer Sharing (*Telecentros*)

---



- Compartel program of Colombia
- Privately run facilities with computers, phones, etc
- Over 1,500 centers



# Going Beyond Telecentres

---



- Single display groupware
- Multiple inputs single output
- E.g. mutli-mouse system
- Can enhance learning outcomes, cooperation, and retention



# Going Beyond Telecentres

---



- Co-present groupware
- Both multiple input and output devices
- E.g. split-screen system targets SME's
- Just emerging





# Going Beyond Telecentres

---



- Advanced (internet 2.0) sharing
- Sharing rich media, live streams, social networks, and more
- E.g. YouTube, MySpace, digg, del.icio.us, moodle, flickr, wikipedia, blogspot....



# The Role for Regulators

---

- Low-barriers to entry for entrepreneurial sharing
- Entrepreneur training significant
- Think well beyond telecentre
  - Innovations to support sharing for pedagogy, community, assistive needs
- Sharing always comes with security & privacy issues



# Conclusions: End-User Sharing Can...

---

- Reduce costs
- Increase access
- Enhance collaboration and communication
- Provide assistance for people with special needs
- Support novel applications and innovative services
- Improve learning outcomes



# Conclusions: And Regulators Should...

---

- Ensure market is complimented and not constrained by end-user sharing
- Protect consumers with minimal service levels
- Guard data privacy and security
- Deliver on universal service aspirations by leveraging shared resources
- Enable human and infrastructure capacity building



International Telecommunication Union

# GSR 2008

Discussion  
Paper

Comments are welcome and should be sent by 13 April 2008 to [GSR08@itu.int](mailto:GSR08@itu.int)



**Thank you!**

[mikeb@cc.gatech.edu](mailto:mikeb@cc.gatech.edu)

[www.itu.int/gsr08](http://www.itu.int/gsr08)

# GSR 2008

Discussion  
Paper

Comments are welcome and should be sent by 13 April 2008 to [GSR08@itu.int](mailto:GSR08@itu.int)



## GSR 08: Session 7 International Mobile Roaming Regulation: An Incentive for Cooperation

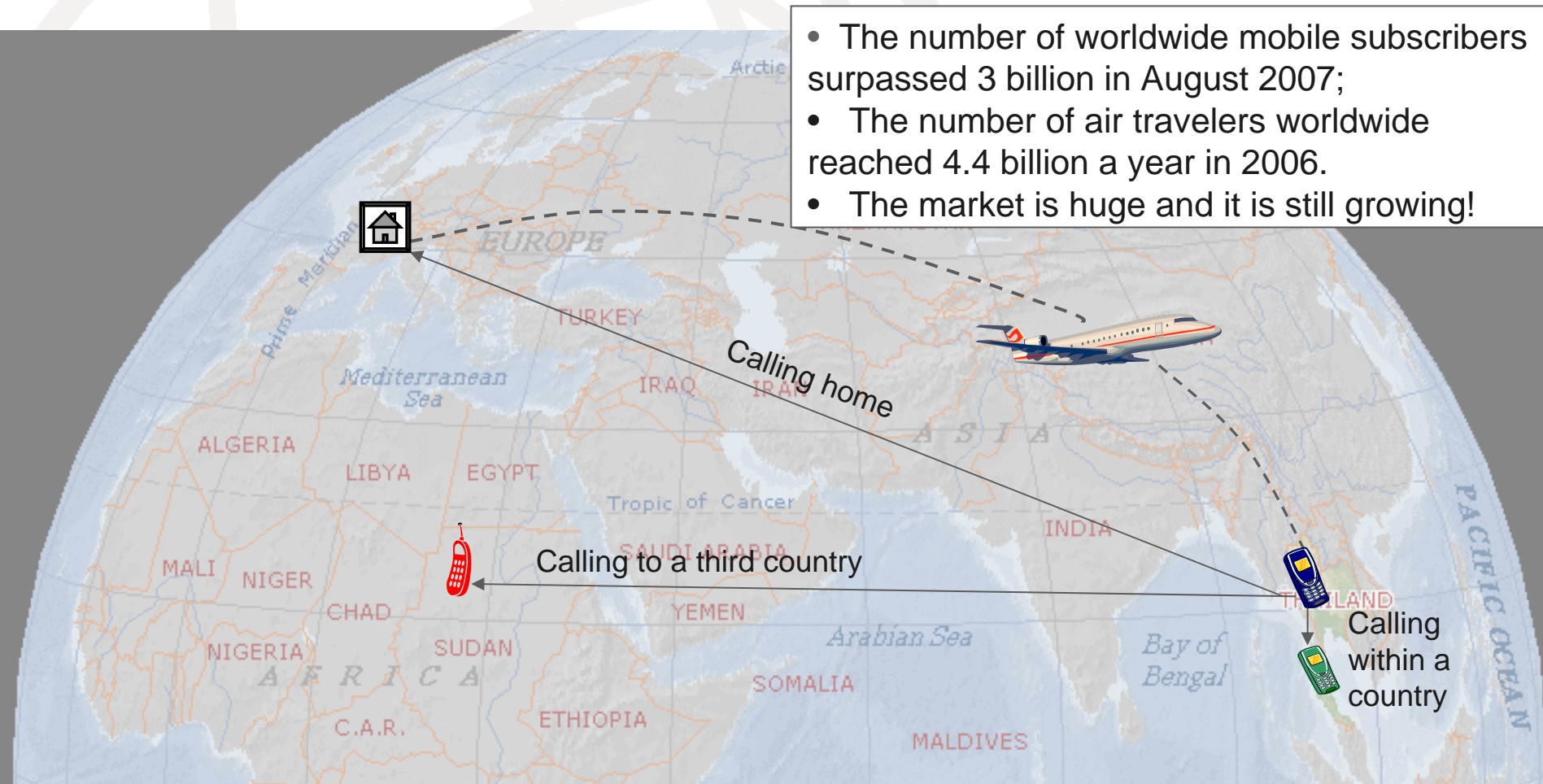
**Vaiva Lazauskaite**  
Economic Analyst  
International Telecommunication  
Union (ITU)



# International mobile roaming – what it is all about?

International mobile roaming services allow customers of a home mobile network operator to use mobile services when traveling abroad.

- The number of worldwide mobile subscribers surpassed 3 billion in August 2007;
- The number of air travelers worldwide reached 4.4 billion a year in 2006.
- The market is huge and it is still growing!



# Price – is what makes international mobile roaming less attractive

Example:



Which mobile phone should I use while visiting Thailand?	Calling Home (peak)	Calling locally (peak)	Receiving a call (peak)	Sending an SMS
Lithuanian operator	2.36 USD	0.94 USD	3.63 USD	0.53 USD
Swiss operator	4.80 USD	4.80 USD	2.88 USD	0.43 USD
Thai pre paid (activation fee - 6 USD)	To LT – 1.22 USD To CH - 0.68 USD	0.06 USD	free	National – 0.09 USD International - 0.16 USD

March 2008

# What makes international mobile roaming expensive?

## ➤ Costs?

Call type	Cost elements
Retail charge for international call (call from mobile phone)	Mobile origination + International transit + Mobile or fixed termination + Retail costs
Retail charge for outgoing international mobile roaming call	Mobile origination + International transit + Mobile or fixed termination + <b>Roaming-specific costs</b> + Retail costs

**Roaming specific costs** – costs incurred by operators for roaming-specific services, e.g. contracting, billing other operators, testing, specific signaling, etc. 1-2 euro cents, according to the EC.

# What makes international mobile roaming expensive?

➤ or operators' cooperation?

**International roaming agreements** are an essential precondition for international mobile roaming provision. Among other technical specifications, they set **Inter-Operator Tariffs** (IOT), which are agreed bilaterally between the home and visited network operators.

International mobile roaming services are usually **vertically integrated**, meaning that both network and service operations are carried out by the same operator, thus giving greater control to mobile operators over their customers.

This creates a **challenging task for regulators** – getting information and calculating international mobile roaming costs.

## International mobile roaming tariff regulatory strategies

After analyzing international mobile roaming costs and actual prices charged, regulators might choose one of the following strategies:

- **No direct regulation** of any international mobile roaming tariffs;
- Regulating **wholesale** international mobile roaming rates only;
- Regulating **retail** international mobile roaming charges only;
- Regulating both **wholesale** and **retail** international mobile roaming rates.



## International mobile roaming regulatory practices

- There is little practice of regulating international roaming rates across the world except:
  - *the “Eurotariff” (the EU) – regulates both retail and wholesale rates*
  - *IDD-based in Arab States (AREGNET recommendation to regulate both retail and wholesale rates);*
- Other ways of dealing with International mobile roaming rates issue:
  - *”Plastic roaming” (across the world);*
  - *“One network” (some African countries, planned in Arab States, Conexus Mobile Alliance in Asia);*
  - *One SIM card with 2 or 3 numbers (China, Hong Kong, China and Macau, China).*



## Some insights

- The important role of **transparency**;
- **Be ready to debate and discuss** - the final outcome of the EU regulatory debates was a compromise between all stakeholders. The Arab region is currently in the middle of this process, and is working to allow the voices of all parties concerned to be heard.
- **Share regulatory practices** - regional cooperation between regulators as well as appropriate legal instruments will play a vital role for the successful finalization of any regulatory process. This could be very important for strengthening regulators' negotiating power.
- The success and final result of any regulatory approach depends largely on **how closely different stakeholders cooperate and how openly they discuss and debate the issues**.
- The **customer** is the one that we should all care about.

International mobile roaming is, in fact, possible because of cooperation between operators. This suggests that international mobile roaming regulation is only possible through cooperation among regulators.



The GSR may be the best opportunity to start the discussions!

# GSR 2008

## Discussion Paper

Comments are welcome and should be sent by 13 April 2008 to [GSR08@itu.int](mailto:GSR08@itu.int)



**Thank you!**

**[vaiva.lazauskaite@itu.int](mailto:vaiva.lazauskaite@itu.int)**

**[www.itu.int/gsr08](http://www.itu.int/gsr08)**

# GSR 2008

## Discussion Paper

Comments are welcome and should be sent by 13 April 2008 to [GSR08@itu.int](mailto:GSR08@itu.int)



Telecommunications Management Group, Inc.



## GSR 08: Session 7 **IPTV and Mobile TV**

**Janet Hernandez**  
**Telecommunications**  
**Management Group (TMG),**  
**Inc., United States**

# What is IPTV and Mobile TV?

## IPTV

Ability to offer a variety of video and interactive services over an IP platform, typically viewed by the consumer via a television

## Mobile TV

Ability to offer video services via a cellular network (i.e., 2G or 3G networks) or a one-way dedicated broadcast network

### Potential Services:

- Live television channels
- Video on Demand (e.g., movies)
- Pay-per-view live events (e.g., football)
- Radio stations
- IPTV - Personal video recorder (viewer can watch programming at time and manner of own choosing)
- Mobile TV – multimedia functions – camera, video recorder, music player



# What Issues and Challenges are Presented by IPTV and Mobile TV?

---

✓ Classification

✓ Licensing

✓ Existing Frameworks

✓ Institutional Frameworks



# Classification of IPTV and Mobile TV

IPTV

Mobile TV

Broadcasting, telecom or  
information services?

Should a technology neutral  
approach be followed -  
services regulated the same,  
regardless of the platform or  
device?

Should broadcasting regulations  
be modified to include IPTV  
and mobile TV?

Should regulatory classification  
be based on control and  
interactivity?

Should services be exempt  
from regulation or subject to  
less regulation until market  
develops?

# What Licensing Requirements are Imposed on IPTV and Mobile TV?

- Does the regulatory framework require such services to be subject to licensing?
  - Different approaches
    - License requirement may vary based on service being offered (e.g., live television or video-on-demand)
    - Licensing IPTV as a pay television service (e.g., Hong Kong)
    - Creating a new category of licenses for such services (e.g., South Korea, Pakistan)
    - Requiring a provider to obtain broadcasting and telecom licenses (e.g., Pakistan, Hong Kong SAR, Singapore)
    - Allowing provision of IPTV or mobile TV if operator already holds carrier license

# Does the Legal and Institutional Framework Facilitate the Deployment of these Services?

- Are there market entry barriers on incumbent telecom providers that impede their ability to provide video services (e.g., cross-ownership and joint provision restrictions)?
- Does it make sense to apply existing regulations, such as access obligations, to incumbent providers?

# Does the Institutional and Legal Framework Facilitate the Deployment of these Services?

- Are there foreign ownership restrictions that impede investment in such services (e.g., different foreign ownership caps on telecommunications companies versus broadcasters)?
- Should all content regulations applicable to broadcasters be imposed on such providers?
- Are providers under the jurisdiction of different government authorities and subject to different requirements?

# GSR 2008

## Discussion Paper

Comments are welcome and should be sent by 13 April 2008 to [GSR08@itu.int](mailto:GSR08@itu.int)



**Thank you!**  
**[janet@tmgtelecom.com](mailto:janet@tmgtelecom.com)**

**Janet Hernandez**  
**Senior Vice-President**

Telecommunications Management  
Group, Inc.

1600 Wilson Boulevard, Suite 710

Arlington, VA 22209, USA

+1.703.224.1501

[www.tmgtelecom.com](http://www.tmgtelecom.com)

**[www.itu.int/gsr08](http://www.itu.int/gsr08)**



**Document of the Global Symposium for Regulators (GSR)**  
**11 – 13 March 2008 – Pattaya, Thailand**

**Document Session 8**

*Universal Access Module & Infrastructure Sharing Practices*

Sonja Oestmann, intelecon



# Universal Access Module

## *& infrastructure sharing practices*

March 13, 2008

Sonja Oestmann



*opening telecommunications opportunities*



intelecon

research & consultancy ltd • Vancouver • Canada

# *Objective of presentation*

1. Introduce ICT Regulation Toolkit Module 4 – Universal Access
2. Best practice Universal Access and Service Funds (UASFs) and examples
3. How can infrastructure sharing be part of UA policy and strategy?
4. Second wave of regulation and new objectives: affordable access to broadband services

# ICT Regulation Toolkit: Module 4 – Universal Access (UA)

- <http://icttoolkit.infodev.org/en/index.html>



- Beta-version of the first part is ready for public viewing and comments:

- Overview of the UA concept
- Regulatory reform and UA
- Overview of UA approaches



- Second part is the “How to” of the UA Toolkit:

- How to develop a UA policy
- How to finance a UA program
- How to choose between UA options through economic analysis
- How to develop the specific UA program and UA projects
- How to manage the competitive minimum subsidy auction process; and
- How new technologies impact UA

# *A word about UASFs*

Some of the key principles & elements of best practice UASFs:

- Technology neutral, transparent, impartial and fair
- Separate UASF account, independently audited and public financial reports
- Uses competitive allocation method: minimum subsidy auction
- Used as last resort – in areas where the market fails, after sector reform and enabling regulation
- UA program developed with industry and other stakeholder consultation
- Focus on ongoing sustainability
- Collect only needed amount from operators, can be reduced over time

# *Good examples*

- Uganda's Rural Communications Development Fund (RCDF)
  - Country covered by mobile signal, one public access phone for every 2,500 inhabitants
  - 54 districts have Internet POPs
  - Assistance to schools for Internet access, public Internet cafes & ICT training centres
- Mongolia's Universal Service Obligation Fund (USOF)
  - Wireless voice service for all 'soums'
  - Internet POPs and public access Internet centres in ~30 soums
  - VSAT network for nomadic herders
- Chile Telecommunications Development Fund (TDF)
  - Two installations of fibre-optic networks in the south

# *Infrastructure sharing and UA*

- Consider mandating infrastructure sharing if UASF finance is used:
  - Extension backbone to rural areas: winning bidder required to build twice the capacity it needs and offer leased lines to interested parties at cost-based commercial rates (Mozambique)
  - Subsidy to build wireless towers – open access/ shared towers (India)
  - If industry does not see business case to invest in broadband network – UASF could fund shared open access network (Canada)
- Other sharing principles of UASFs:
  - Recipients of funds for pilots publish their experiences (FITEL, Peru)
  - UASF Finances, UA program and results – all public



## *What role can UASFs play in broadband access? (1)*

- Scope of UA and US: typically specific ICT services that majority enjoys and focuses on providing these services to remaining population and areas
- But broadband is an emerging market in most countries
- EU test if a particular service should be part of US scope:
  - In light of social, economic and technological developments, has ability to use the service become essential for social inclusion?
  - Are normal commercial forces unable to make the service available for all to use?
- In 2006, broadband failed the test in the EU as less than half of households had broadband service
- But can UA policy and UA programs ignore broadband? Not really!!!!

## *What role can UASFs play in broadband access? (2)*

- UA policy that promotes broadband needs to focus on:
  - Implementing necessary sector and regulatory reforms (e.g. international gateway liberalization)
  - Create incentives for broadband development (e.g. tax breaks for fibre-network deployment)
  - See ITU Trends Publication 2006: Regulating in the Broadband World
- In addition, UASFs can fund broadband pilots:
  - Find out why industry is not investing in certain areas – what are uncertainties?
  - Pilot to test some of the uncertainties e.g. what is the demand in rural areas? Will an open access network work? Who should manage it?
  - Use pilot to learn and stimulate the market
- If backbone transmission is the challenge, UASFs can assist with open access backbones including funding
  - Careful consideration and feasibility study if appropriate for particular country

# Thank you

[soestmann@inteleconresearch.com](mailto:soestmann@inteleconresearch.com)



*opening telecommunications opportunities*

 **intelecon**

research & consultancy ltd • Vancouver • Canada



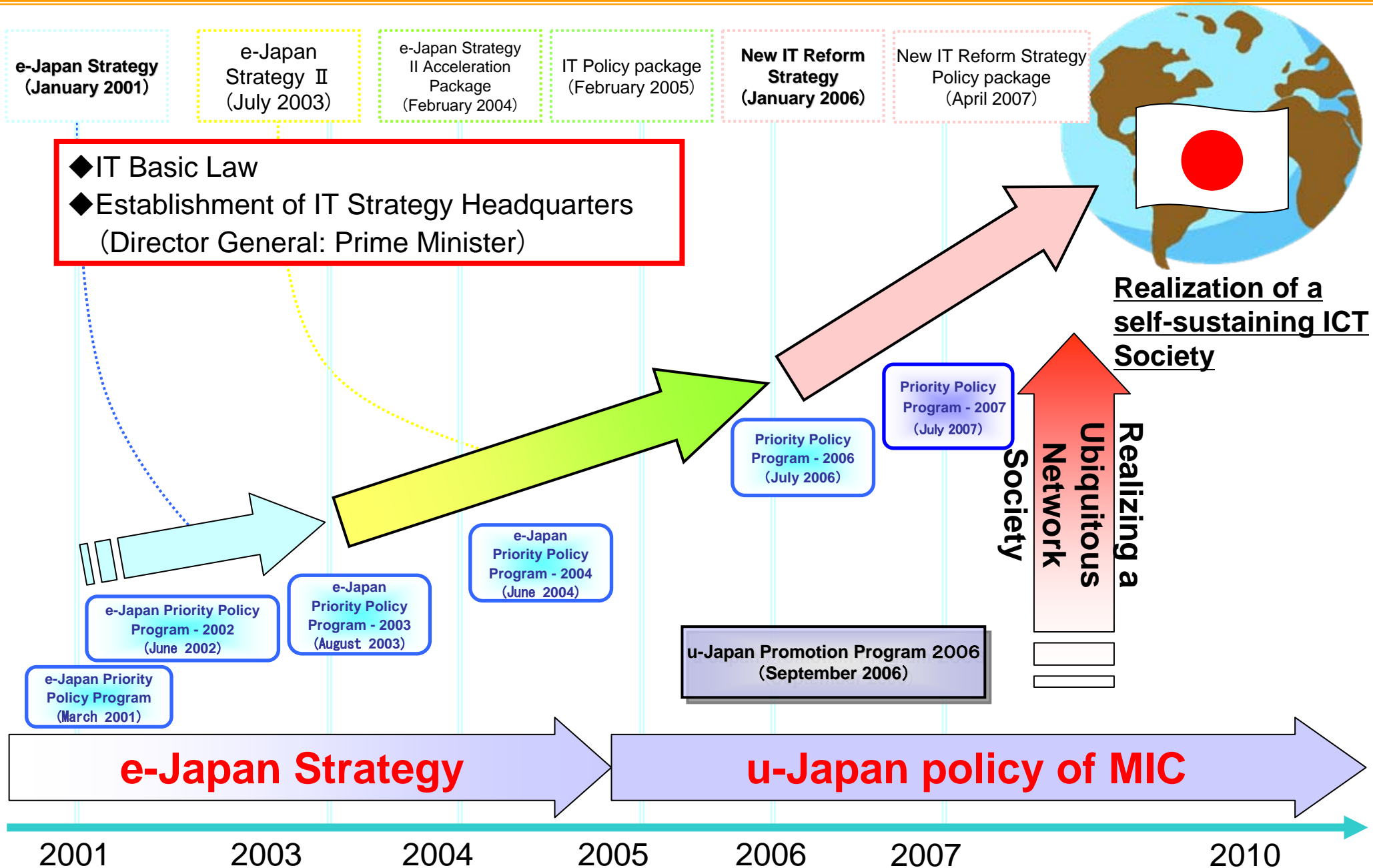
**Document of the Global Symposium for Regulators (GSR)**  
**11 – 13 March 2008 – Pattaya, Thailand**

**Document Session 8**

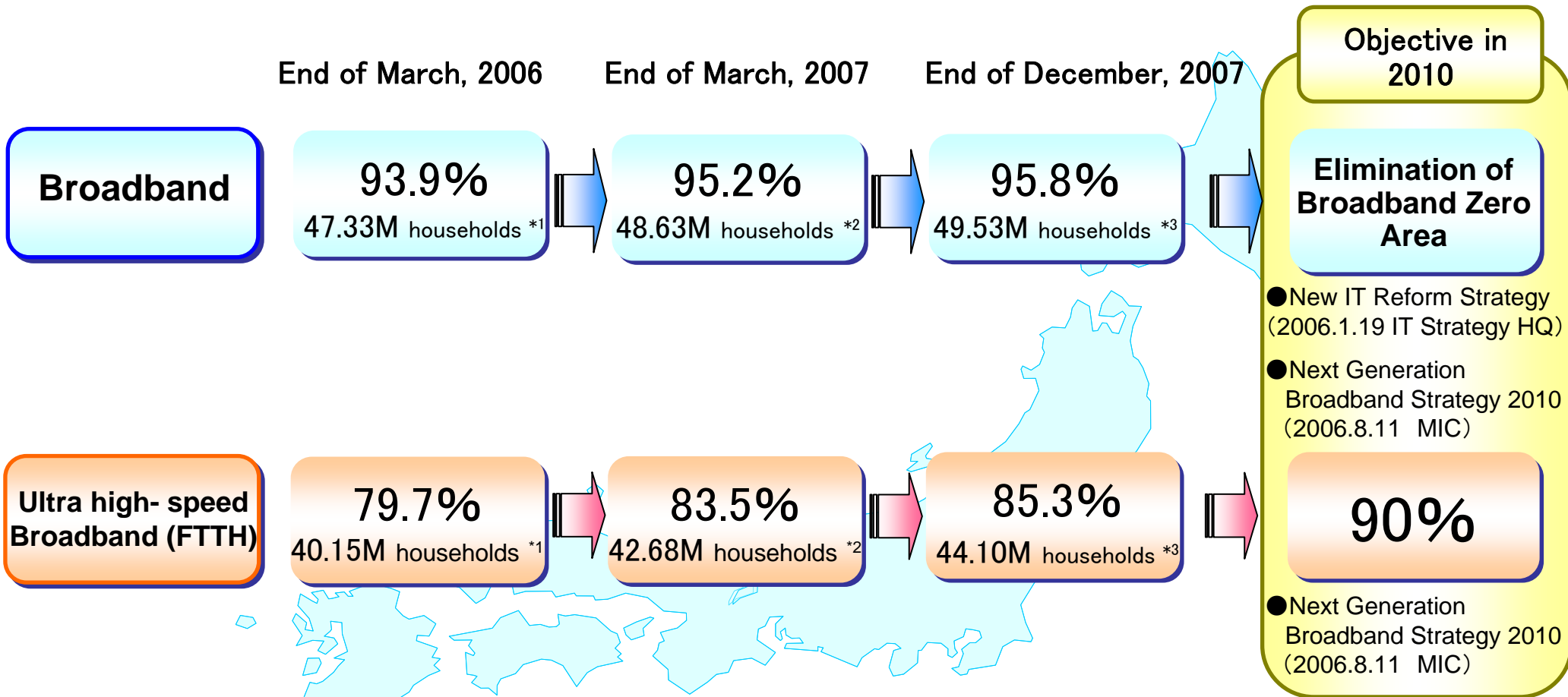
*National target: Steps taken in Japan on ICT Strategies*

Issei Yamamoto, Institute for Information and Communications Policy

# National target : Steps taken in Japan on ICT Strategies



# Service Area Coverage Rate of Households (Estimate)



\*1 The total number of the households are based on Juki Net at the end of March, 2005 (50.38M households)

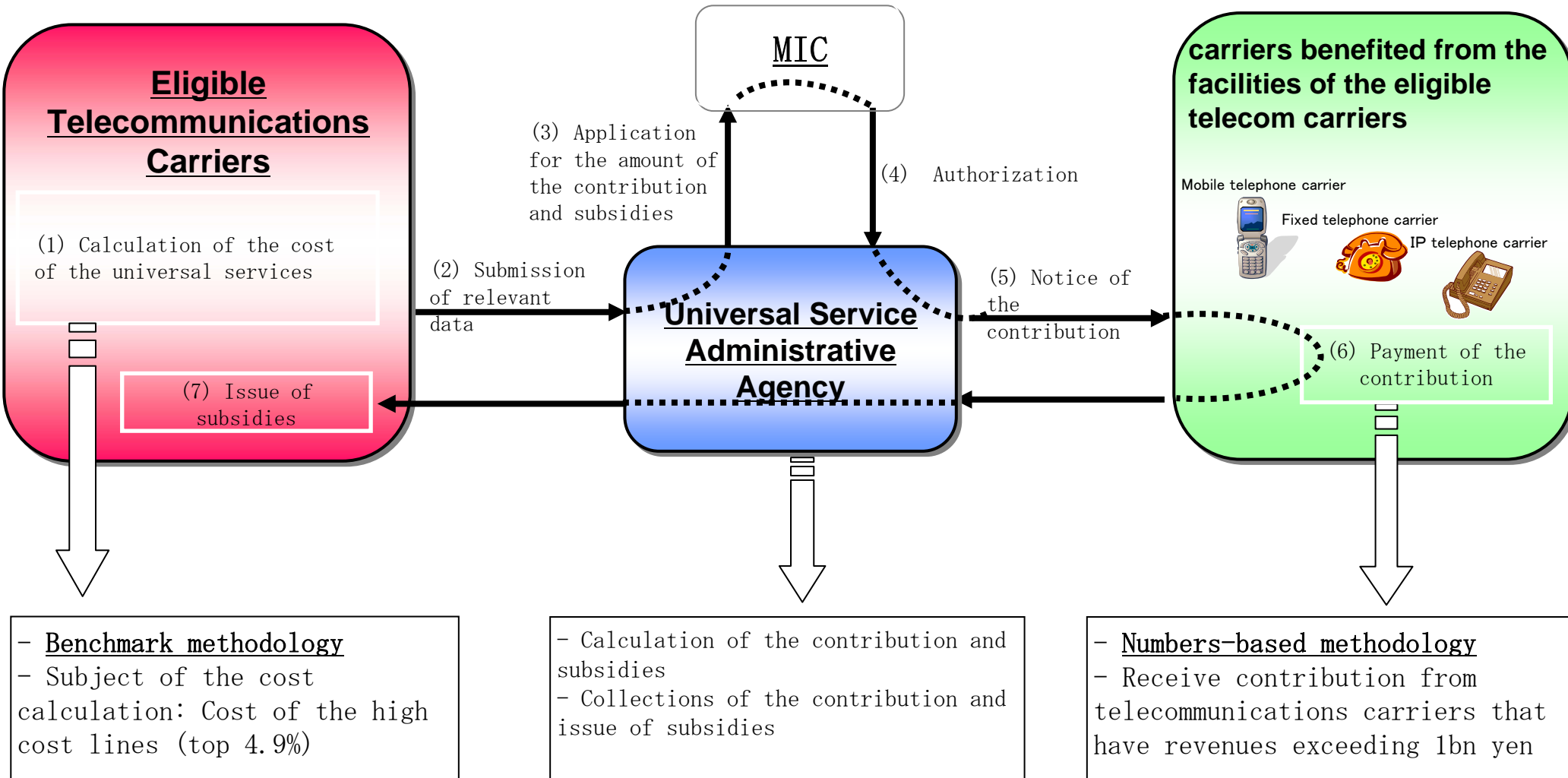
\*2 The total number of the households are based on Juki Net at the end of March, 2006 (51.10M households)

\*3 The total number of the households are based on Juki Net at the end of March, 2007 (51.71M households)



# Summary of the Universal Service Fund System

Universal Service Fund System: Telecommunications carriers benefited from the facilities of the eligible telecommunications carriers contribute to the cost of the universal services.



# Promotion measures aimed at nationwide broadband network development

## 1. Support measures based on Infrastructure Law: Provision of investment incentive to private carriers

### Loans at low interest rates

- Loans at low interest rates regarding capital requirements pertaining to investment in broadband infrastructure development such as for fiber-optic lines and ADSLs (Development Bank of Japan)

### Interest subsidization

- With regard to the interest on the above-mentioned loans at low interest rates, subsidies are granted to carriers by the National Institute of Information and Communications Technology. (Preferential treatment is applied in depopulated areas with respect to lower limit interest.)

### Preferential tax treatment

#### Special writing off regarding corporate taxes (national taxes)

#### Reduction of tax bases for fixed asset taxes (local taxes)

### Debt guarantee

- Guarantee is provided by the National Institute of Information and Communications Technology with regard to funds borrowed at the time of broadband network development, such as for fiber-optic lines and ADSLs.

## 2. Granting of money such as grants and subsidies: Assistance to local autonomous bodies

### Grants

#### ○ Local information and communications infrastructure development promotion grants

- In the interest of organizations such as local autonomous bodies that develop information and communications infrastructure compatible with local features, thereby resolving information disparity, subsidization is provided for assistance purposes on a wide-ranging basis, whether the infrastructure is intended for wire communication or wireless communication.

### Subsidies

#### ○ Local intranet infrastructure facility development promotion grants

- For the purpose of upgrading matters such as local education, administration, welfare, medical care, and disaster damage prevention, assistance is given to the development of local public networks connecting facilities, such as schools, community halls and city offices, at high speed or super-high speed.

### Local financial measures

#### ○ Projects for resolving the problem of non-broadband areas

- If, in the interest of any private carrier that develops broadband networks, the pertinent municipality subsidizes part of the development cost, then it is possible, with respect to the pertinent subsidized portion, to take special local grant tax measures and to allocate depopulated area development bonds and remote area development bonds.

#### ○ Development under local independent projects

- If any broadband network is to be developed as a local independent project, then it is possible to issue bonds such as local area vitalization bonds or depopulated area development bonds.

## 3. Other measures

- Cooperation with related government agencies (including the Ministry of Agriculture, Forestry, and Fisheries)
- Promotion of activities by promotion setups consisting of carriers and autonomous bodies
- Development of environment for utilizing technologies whereby wire communication and wireless communication are combined
- Promotion of practices whereby fiber-optic networks developed by local autonomous bodies are opened to the private sector

# Vision of 100% Broadband Network, the u-Japan Infrastructure

