

Fiber to the Home: Myths versus Realities

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18 March 2004

Convergence India

CORNING

Discovering Beyond Imagination



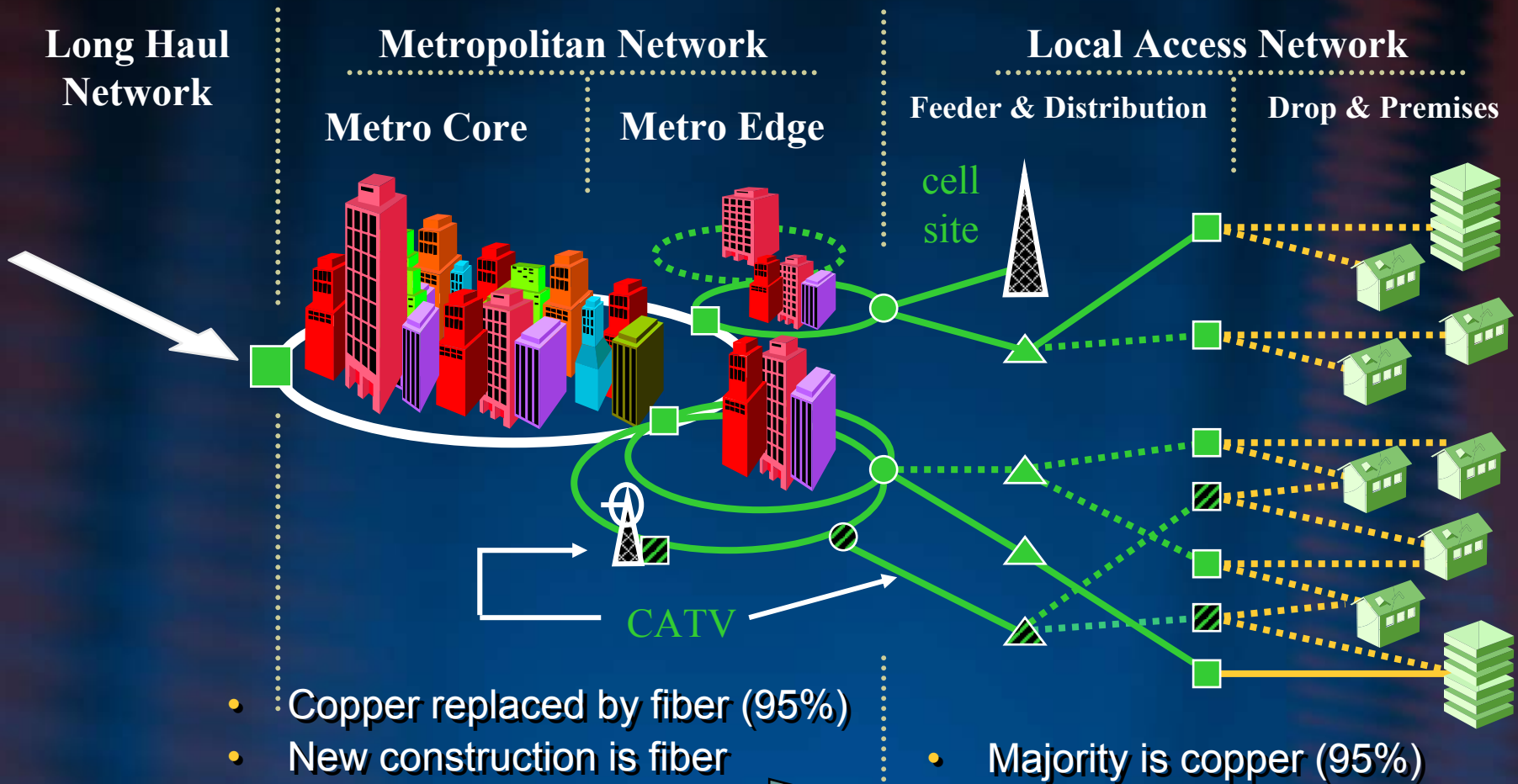
Agenda

- Broadband Overview
- Myth: There are no applications that need FTTH
- Myth: FTTH is not economically viable
- Myth: FTTH is years away... “not in my lifetime”
- Myth: Last-mile fiber is a monopoly
- Apply these lessons learned to India

Network description

-- Holistic network

Fiber ————
 Copper / Coax ······



- Copper replaced by fiber (95%)
- New construction is fiber

- Majority is copper (95%)

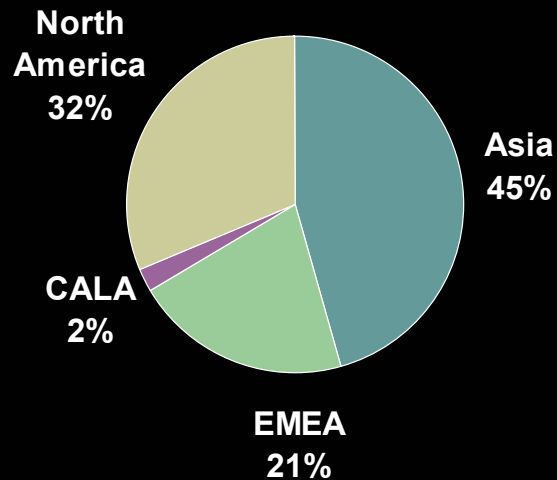


Global Broadband Statistics

-- An update

North America

Broadband lines by region



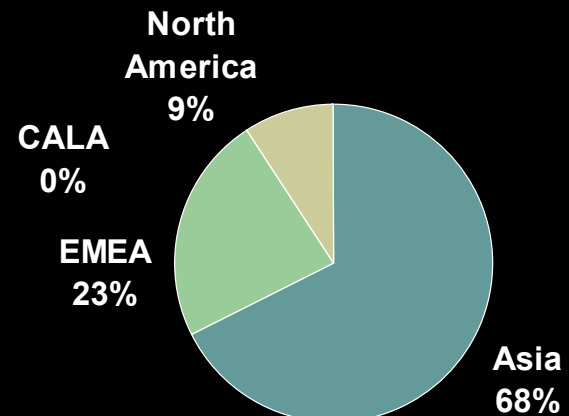
2 M subscribers

DSL leads

Growth picking up

Europe

FTTH lines by region



Deep penetration

1.1 M FTTH subs

Q4 2003

Trends and Drivers

-- *Convergent Services*

- Technology is enabling carriers to eliminate service boundaries
- Carriers are moving toward convergence of services
 - Offering the “triple play” of voice, video and data in order to:
 - Fend of competition
 - Reduce customer churn
 - Increase sagging revenues



**CONVERGENT
TRANSFORMATION**

FTTH Myths

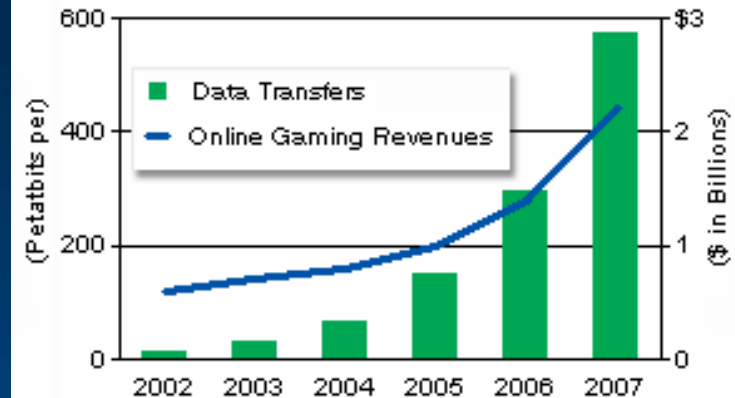
- There are no applications that need FTTH

Myth: There are no applications that need FTTH

-- Game On!

- Internet games account for 9% internet of traffic in 2002; 50% forecasted increase for 2003
- Stressing existing networks
 - X-Box private network
 - PS2 controlled release of adapter
- Gaming industry examples:
 - Driving broadband in Korea ; 90% Internet users play games
 - iResearcher reports Chinese users for fee-based online games will reach 9.2 million in 2003 and 14.3 million in 2004
 - NetEase.com earned \$8.5M in revenues during Q4'04 alone (31.8% increase QOQ; a 222.2% surge YOY)

Total Worldwide Revenues & Data Transfers for Online Gaming





Source: In-Stat/MOR 3/03



Myth: There are no applications that need FTTH

-- Video On Demand (VOD)

Typical download rates for *Braveheart*

Technology	Minutes	Hours	Days
Modem 56 kb/s			2
ISDN 128 kb/s		20	
 DSL 1 Mb/s		12	
Cable 2.5 Mb/s		2.5	
	45	1	
FTTP	0.4		

- VOD increasing in use
- Driver of bandwidth demand
- Services offered via...
 - Digital Cable
 - VDSL
 - Movielink™
 - CinemaNow™
 - ...but limited service or selection
- Fiber will be the inevitable solution to provide the most versatile service

Source: FTTH Council

Myth: There are no applications that need FTTH

-- *Remote applications*

- **Telemedicine**

- The use of telecom to provide medical information and services - makes specialty care more accessible to underserved areas
- Store and Forward - Transfer of digital images
 - Teleradiology (X-rays, MRI) & Telepathology (pathology slides)
- Two-Way Interactive Television (IATV)
 - “Face to Face” consultations



- **Teleworking**

- By the end of this year 140 million teleworkers
- Telework creates win-win proposition for host companies and service providers
- Employee satisfaction, work output and productivity increases
- Broadband driver - Broadband connectivity is a prerequisite - Driving toward symmetrical connectivity



FTTH Myths

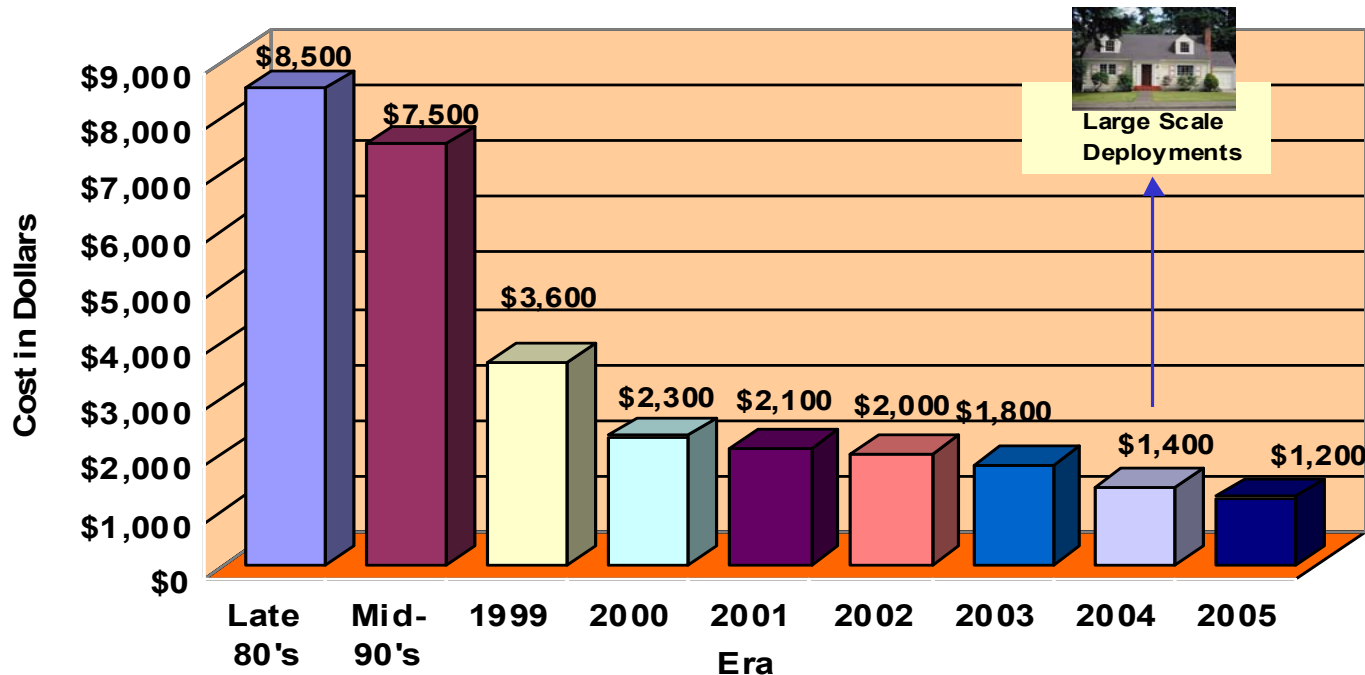
- There are no applications that need FTTH
- FTTH is not economically viable

Myth: FTTH is not economically viable

-- Cost declines: one vendors view

Dropping costs of FTTP deployment

(includes labor, construction and electronics)

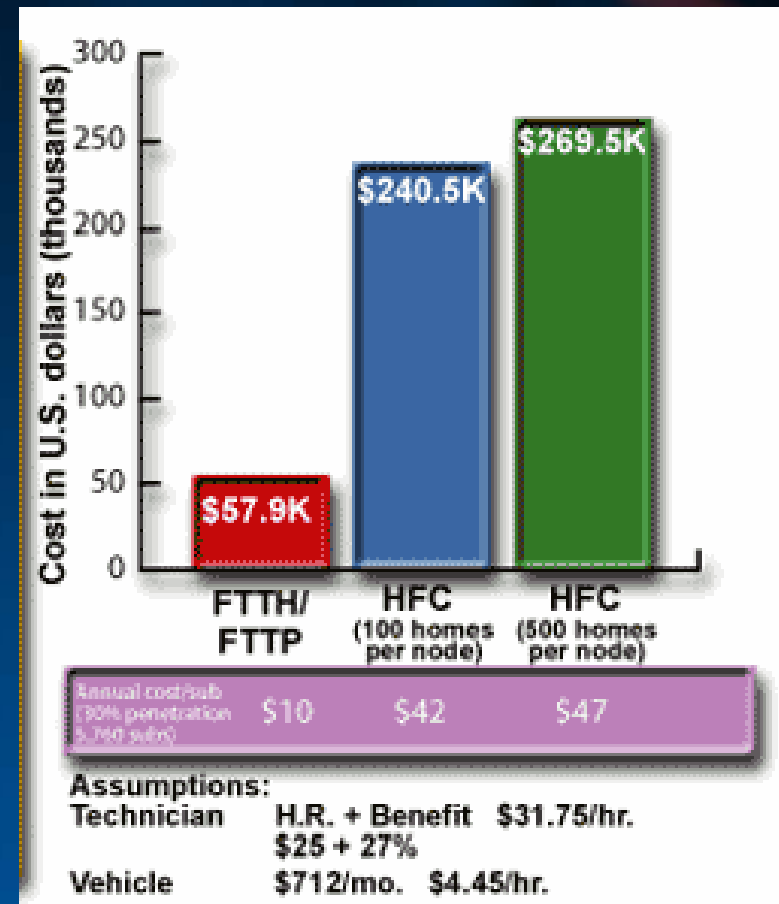


 **Optical Solutions**
Fiber Powered Communities

Myth: FTTH is not economically viable

-- Substantial OPEX savings

- FTTH construction costs are only one piece to the puzzle
- **The cost of maintaining a fiber based network is far less than copper networks...**perhaps as much as four to eight times less
- FTTH will provide a competitive advantage to those carriers that deploy
 - Continual upgrades are required for today's copper solutions in order to provide the services customer demand



Source: WaveOptics7

FTTH Myths

- There are no applications that need FTTH
- FTTH is not economically viable
- FTTH is years away... “not in my lifetime”

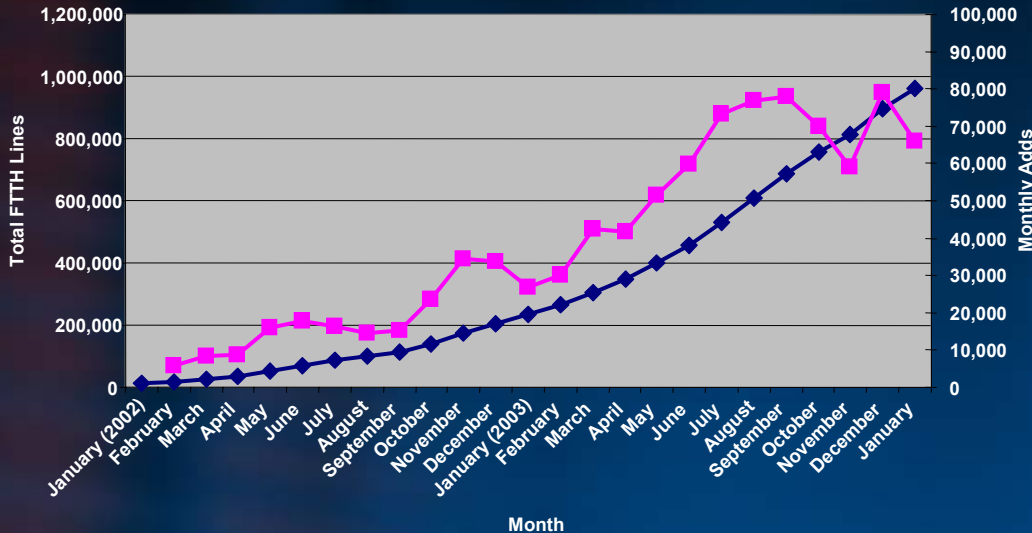
Broadband In Asia

-- Japan: e-Japan strategy



FTTH Subscribers in Japan

— Total — Monthly Adds



Today's Telecom Market (FEB '04)

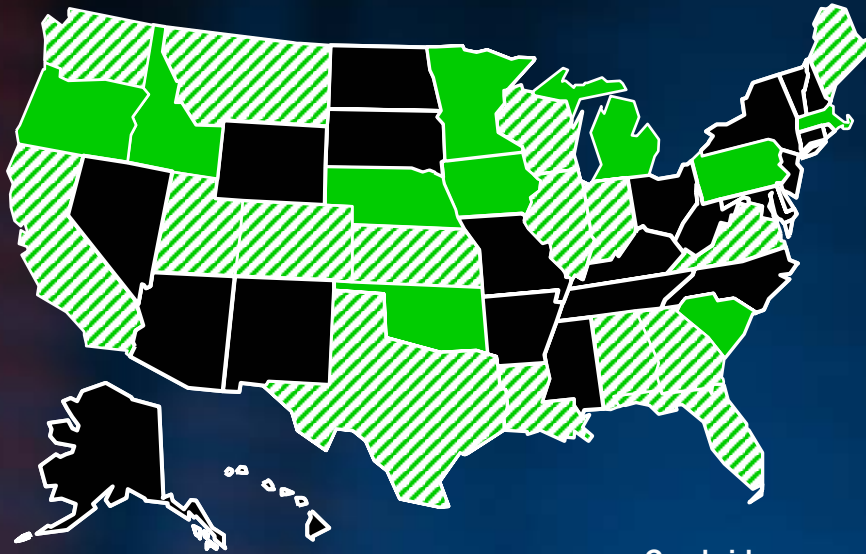
- 51M fixed line subscribers
- 76M wireless subscribers
- 14.1 broadband subscribers
- 10.6M DSL
- 2.5M Cable Modem
- 0.96M FTTH

- e-Japan project initiated in 2001 with the following goals:
 - Japan will be the most advanced IT nation within 5 years
 - 30M high speed subs (10 Mb/s), 10M ultrahigh speed subs (100 Mb/s-FTTH)
- e-Japan II: focuses on content and harnessing capacity of new services

Source: Ministry of Public Management--Information and Communications in Japan

Myth: FTTH is years away...“not in my lifetime”

-- List of ‘US Optical Fiber Communities’*



Alabama
Sylacauga
Union Springs
California
Amerige Heights
Canyon Hills
Kenwood
Lincoln Crossing
Palo Alto
Parc Metropolitan
Poppy Measdoss
Mission Bay
Roseville
Sacramento
Talavera

Colorado
Buckhorn Valley
Chatfield Corner
Colorado City
Eagle Ranch
Rye
Florida
LPGA Community
Magnolia Lake
Georgia
Dunwoody
Dalton
Iowa

Cambridge
Guthrie Center
Huxley
Slater
Idaho
Bear Creek
Illinois
Paxton
Salem
Indiana
Bay Creek
Gateway Crossing
Rochester

Kansas
Almena
Hill City
Luka
Norton
Osborne
Quinter
Sharon
Turon
Wakeeney
Wamego
Louisiana
Squire Creek Homes
Maine
Norway
Massachusetts
Pine Hills
Tauton
Michigan
Cobblestone
Minnesota
Alberta
Chokio
East Ottertail
Evermoor
Morris
Nebraska
Blair

Montana
Baxter Meadows
Ironwood
Oklahoma
Hinton
Oregon
Woodburn
Pennsylvania
Kutztown
South Carolina
Daniel Island
Sandy Point
Texas
Burleson
Canyon Gate Brazos
Crystal Falls
Grand Lake Estates
Lake Ridge South
Lakes on Eldridge
Laredo
Northpointe
Rock Creek
Victory Lakes
Utah
Deer Mountain
Kamas
Provo

Virginia
Ashburn
Brambleton
Braemar-Bristow
Bristol
Independence
Leesburg
Purcellville
Washington
Chelan County
Clallam County
Douglas County
Grant County
Issaquah Highlands
Mason County
Wisconsin
Berkseth-Baldwin
Prairie View
Reedsburg



Source: Render, Vanderslice & Associates

FTTH Myths

- There are no applications that need FTTH
- FTTH is not economically viable
- FTTH is years away...“not in my lifetime”
- Last-mile fiber is a monopoly

Myth: Last-mile fiber is a monopoly -- Downtown Tokyo --- Competition!



Multiple fibers passing the same homes!

FTTH Myths versus Realities

-- *Lessons Learned Applied to India*



- FTTH deployment is a reality today
 - Long-term solution for broadband networks
 - Growing steadily but still hampered by myths
 - New applications are driving traffic growth
- Why FTTH? Why Today? Why India?
 - National broadband policies
 - *Convergence called out in 10th Five Year Plan Objectives*
 - *“building...infrastructure to meet **convergence** of telecom, IT and media”*
 - Carrier increased competition
 - *Carriers grow by offering new services via advanced networks*
 - Fiber provides an OPEX advantage over copper
 - *Access technology is a viable, economic reality today*
- The dawn of FTTH in India is here!



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