GREENBERG
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December 16, 2003

VIA ELECTRONIC FILING

Marlene Dortch, Secretary
Federal Communications Commission
The Portals
TW-A325
445 12th Street, S.W.
Washington, D.C. 20554

Re: Ex Parte Presentation
WC Docket No. 01-338

Dear Ms. Dortch:

On December 15, 2003, Kirsti Spiva with Alloptic; Jim Farmer with Wave7Optics; Max Nelson with OFSOptics; Kevin Joseph and Megan Delany with Allegiance Telecom; and Walter Steimel, Jr., representing the Fiber to the Home (FTTH) Council, met with Commissioner Kevin Martin and Dan Gonzalez, Esq., Senior Legal Advisor to the Commissioner. We discussed the Commission's adopted rules concerning Fiber-to-the-Home deployment and specifically the BellSouth Petition for Reconsideration. In addition, we proposed the attached clarifications. The attached documents were distributed and discussed at the meeting.

Pursuant to the Commission's Rules, please include this notice and attachments in the record of the proceeding identified above.

Very truly yours,

Walter Steimel, Jr.

Cc: Pamela Arluk, Esq.
Marcus Maher, Esq.
Brent Olsen, Esq.
(all with attachments, via First Class Mail)

Enclosures

(3) Fiber-to-the-home loops. A fiber-to-the-home loop is a local loop consisting entirely of fiber optic cable, whether dark or lit, *newly deployed on or after October 2, 2003 from the serving central office to* a *mass market* end user's customer premises, *regardless of whether the premises is located in a single-occupancy building or in a multiple dwelling unit ("MDU") building. Mass market end user customer shall mean any customer subscribing to four or fewer voice grade equivalent lines. The definition of "multiunit premises" set forth in 47 C.F.R. § 68.105(b) shall be used to define MDU building for purposes of fiber-to-the-home loops.*

(i) New Builds. An incumbent LEC is not required to provide nondiscriminatory access to a fiber-to-the-home loop on an unbundled basis *to competitors seeking to use the loop to serve mass market end user customers* when the incumbent LEC deploys such a loop to an end user customer's premises that previously has not been served by any loop facility. *A loop shall qualify as a New Build fiber-to-the-home loop only where the following conditions are met:*

(A) The incumbent LEC deploys an entirely new fiber loop, including new fiber in-building wiring in MDUs, where the incumbent LEC owns or controls such wiring, from the serving central office to the mass market end user customer's premises.

(B) In deploying the new fiber loop, the incumbent LEC does not use any fiber, passive or active optical or electronic subsystems deployed prior to October 2, 2003 in the local loop from the central office to a mass market end user's customer premises.

(C) The incumbent LEC obtained the right to construct the new fiber loop and provide telecommunications service to the mass market end user customer only after providing written notification regarding the availability of competitive providers of telecommunications service. Such notice shall be signed by those from whom the right was obtained and filed with the Commission.

(ii) Overbuilds. An incumbent LEC is not required to provide nondiscriminatory access to a fiber-to-the-home loop on an unbundled basis *to competitors seeking to use the loop to serve mass market end user customers* when the incumbent LEC has deployed such a loop parallel to, or in replacement of, an existing copper loop facility *from the serving central office to the mass market end user customer's premises. An incumbent LEC is not required to provide nondiscriminatory access to a loop serving an end user customer premises in an MDU building where the incumbent LEC has deployed fiber parallel to, or in replacement of, all of the existing copper facilities, including in-building wiring, unless such in-building wiring is owned or controlled by the incumbent LEC. A loop shall qualify as an Overbuild fiber-to-the-home loop only where the following conditions are met:*

(A) The incumbent LEC deploys an entirely new fiber loop from the serving central office to the mass market end user customer's premises.

(B) In deploying the new fiber loop, the incumbent LEC does not use any fiber, passive or active optical or electronic subsystems deployed prior to October 2, 2003 in the local loop from the central office to a mass market end user's customer premises.

(C) The incumbent LEC obtained the right to construct the new fiber loop and provide telecommunications service to the mass market end user customer only after providing written notification regarding the availability of competitive providers of telecommunications service. Such notice shall be signed by those from whom the right was obtained and filed with the Commission.

(iii) *Maintenance of copper loops or equivalents*. *Notwithstanding paragraph (ii), to qualify as an Overbuild,*

(A) The incumbent LEC must maintain the existing copper loop connected to the particular customer premises after deploying the fiber-to-the-home loop and provide nondiscriminatory access to that copper loop on an unbundled basis unless the incumbent LEC retires the copper loop pursuant to paragraph (a)(3)*(iv)* of this section.

(B) An incumbent LEC that maintains the existing copper loop pursuant to paragraph (a)(3)*(iii)*(A) of this section need not incur any expenses to ensure that the existing copper loop remains capable of transmitting signals prior to receiving a request for access pursuant to that paragraph, in which case the incumbent LEC shall restore the copper loop to serviceable condition upon request.

(C) An incumbent LEC that retires the copper loop pursuant to paragraph (a)(3)*(iv)* of this section shall provide nondiscriminatory access to a 64 kilobits per second transmission path capable of voice grade service over the fiber-to-the-home loop on an unbundled basis.

(iv) Retirement of copper loops or copper subloops. Prior to retiring any copper loop or copper subloop that has been replaced with a fiber-to-the-home loop, an incumbent LEC must comply with:

(A) The network disclosure requirements set forth in section 251(c)(5) of the Act and in § 51.325 through § 51.335; and

(B) Any applicable state requirements.

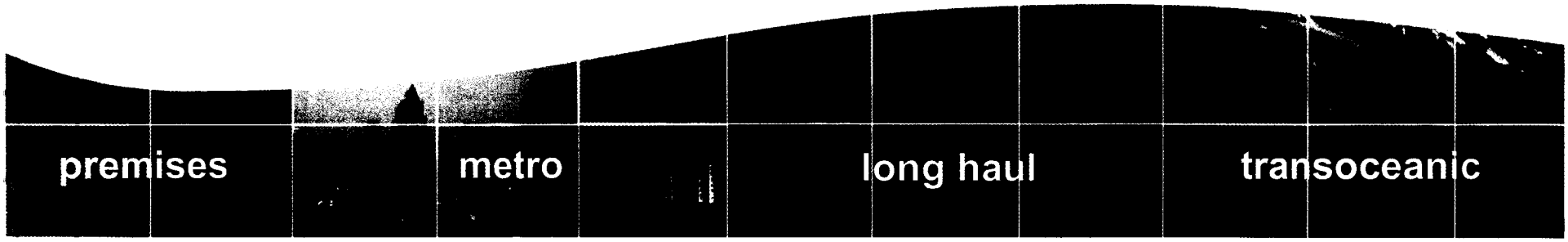
Only FTTP Can Meet the Future Bandwidth Needs For All Consumers With a Cost-Effective Business Case:

The Additional Deregulatory Incentive To Deploy FTTP v Hybrid Networks Must Be Maintained To Spur Investment in 21st C. Networks

Max Nelson

Vice President, Public Policy & Strategic Business Planning

(732) 780-9252 • maxnelson@ofsoptics.com



Disclaimer

The information contained herein represents the views and positions of the Fiber-To-The-Home (FTTH) Council and do not represent either the views or positions of OFS, its employees, or any of its affiliated corporations.

OFS will be happy to express its views and positions in an alternative forum at a later date.

FTTH COUNCIL

The FTTH Council Position
FTTC v FTTP

- FTTC service delivery is not equivalent even though both have V.D.V. Triple-Play
- FTTC is a hybrid network technology with significant TRO deregulation
- All copper-based distance-limited 19th Century technologies will foster digital divide
- Only FTTP provides distance and capacity-unlimited OSP and does so at a cost that is equivalent to hybrid copper-based technologies
- The FCC should promote investment in next-generation 21st Century networks by providing additional deregulation incentive for FTTP
- FTTP loop is a local loop consisting entirely of fiber optic cable, whether dark or lit, newly deployed on or after 10/2/03 from the serving central office to a mass market end-user's customer premises, regardless of whether it is a single-occupancy or MDU (though they do not need to replace in-building wiring with fiber where they do not own or control the wiring) .
- Mass market end user consumer is any customer subscribing to <5 Voice Grade Equivalent Lines (VGELs)
- Greenfield Premises are any premises that previously have not been served by any loop facility and where an ILEC has gained the right to provide FTTP services only after providing written notification regarding the availability of competitive providers of telecommunications service signed by those from whom the right was obtained and filed with the Commission

FTTH COUNCIL

Summary of TRO Policy Position:
Based on Mass Market/Enterprise and Amount of Fiberization

Mass Market [<5 Voice Grade Equivalent Lines (VGELs)]	UNEs Required
Fiber-To-The-Premises (FTTP) Greenfield	NONE

Enterprise Market [5+ Voice Grade Equivalent Lines (VGELs)]	UNEs Required
Fiber-To-The-Enterprise (OCn)	NONE

No UNE Relief for ILECs

Significant UNE Relief for ILECs (Broadband)

Total UNE Relief for ILECs

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Global Broadband: Migrating from Dial-Up to FTTP

North America

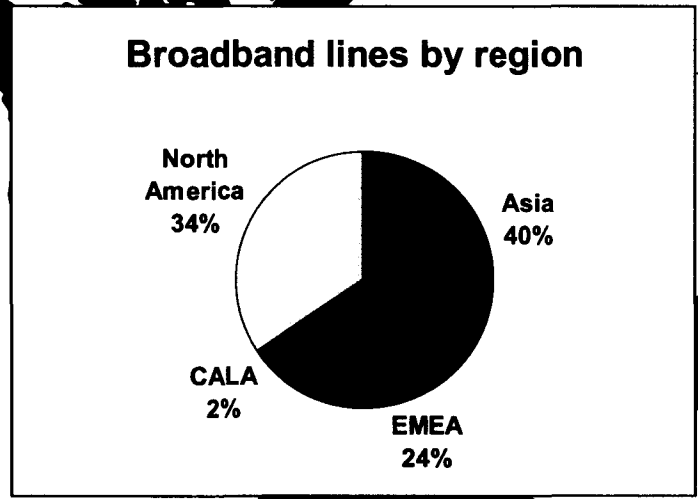
26 M subscribers

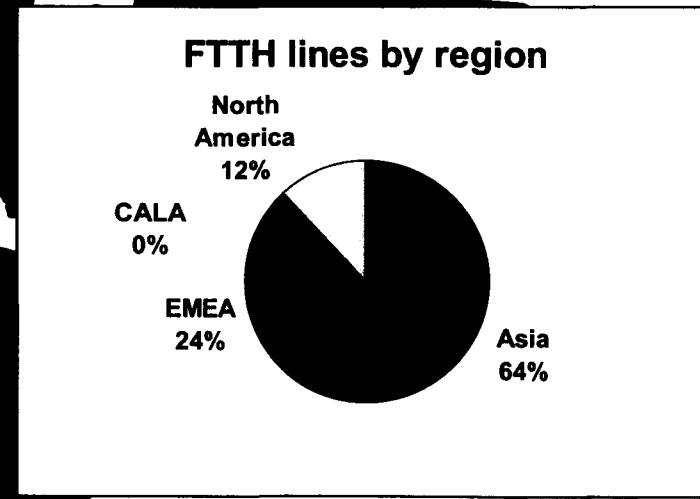
150 k FTTH subs

Europe

18 M Broadband

300 k FTTH subs





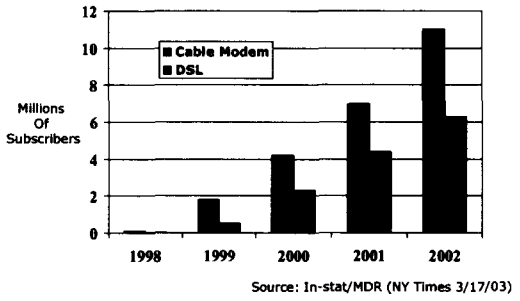
Asia/Pacific

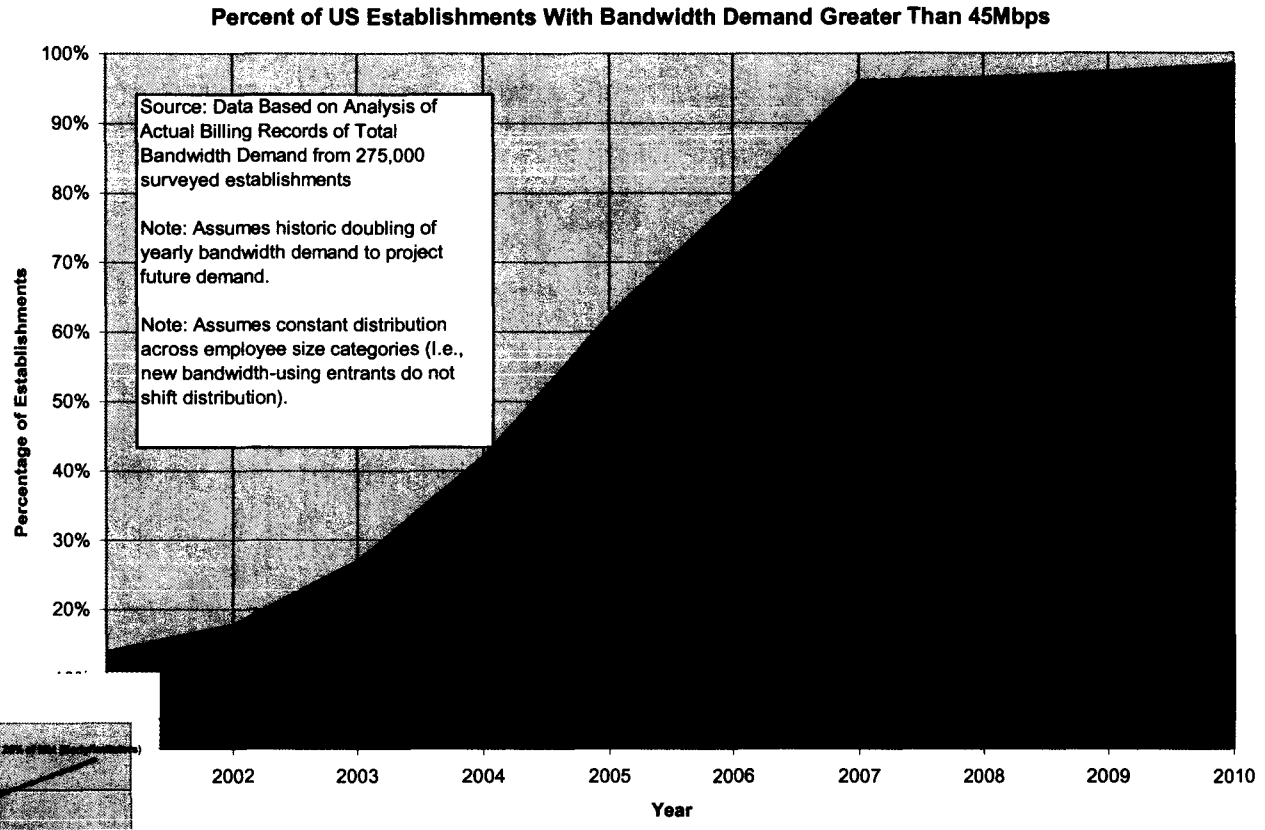
35 M subscribers

800 k FTTH subs

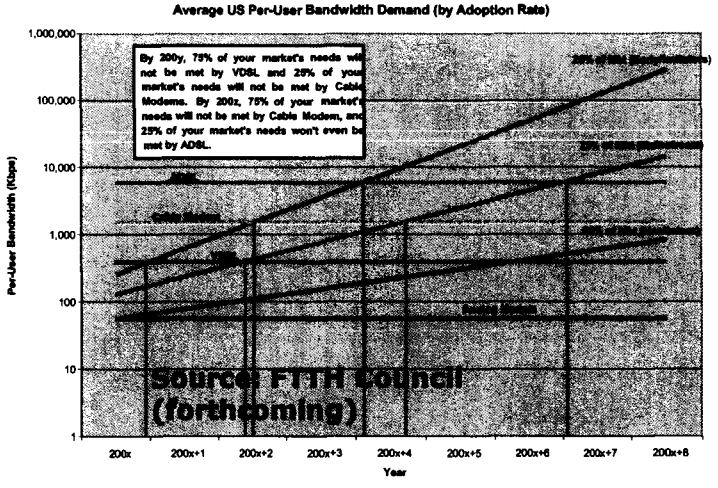
Source: RHK, Corning, Point Topic Q2 2003

Business and Residential Bandwidth Demand:
Growth Keeps Going and Going





Source: OFS Analysis of Harte Hanks Data



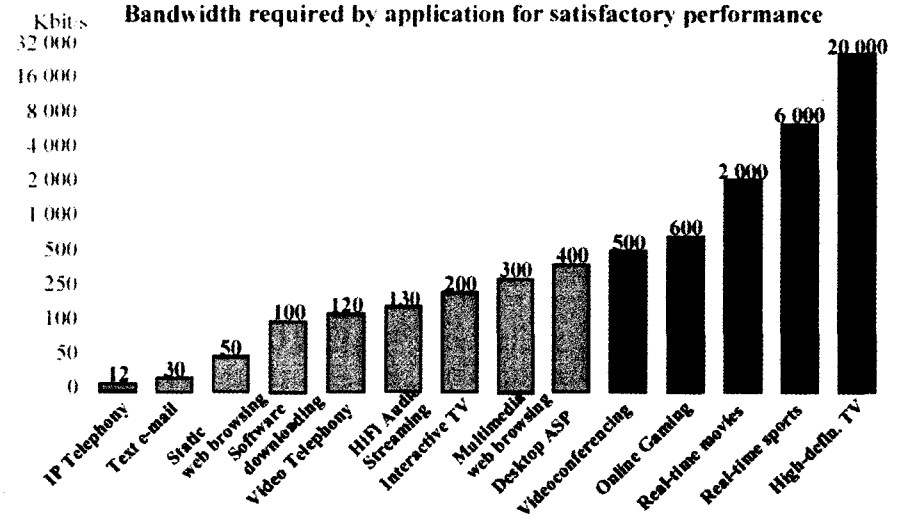
Bandwidth has historically grown 100%/year

Why FTTP?
Because Only Fiber Can Meet Tomorrow's Needs

Bandwidth-Demanding Service	Required Bandwidth Downstream (Kbps)	Required Bandwidth Upstream (Kbps)
Electronic Investment and Banking (per User)	56	56
HTML-based Web Surfing (per User)	56	28
VoIP/POTS (Voice Telephony per Line)	64	64
Application Hosting/Delivery (per User)	128	128
Business Inventory and Remote Management (per User)	256	256
Interactive Remote Learning (per User)	256	256
Internet Gaming (per User)	256	256
Web Camera Videoconferencing (per Channel)	256	256
Rich Content Web Surfing (per User)	512	128
Streaming Content Web Surfing (per User)	1,500	128
Interactive Gaming (per User)	5,000	5,000
Broadcast quality Video (per Channel)	6,000	56
Full-motion Videoconferencing (per Channel)	6,000	6,000
Telemedicine (per User)	6,000	6,000
HDTV (per Channel)	20,000	56
Collaborative Remote Studio/Video Editing	45,000	45,000
LAN-Speed File Transfer/Telework (per User)	54,000	54,000

All future-oriented applications are symmetric in nature

Copper-based technologies are both limited in bandwidth and asymmetric



Source: Peter Linder, Ericsson

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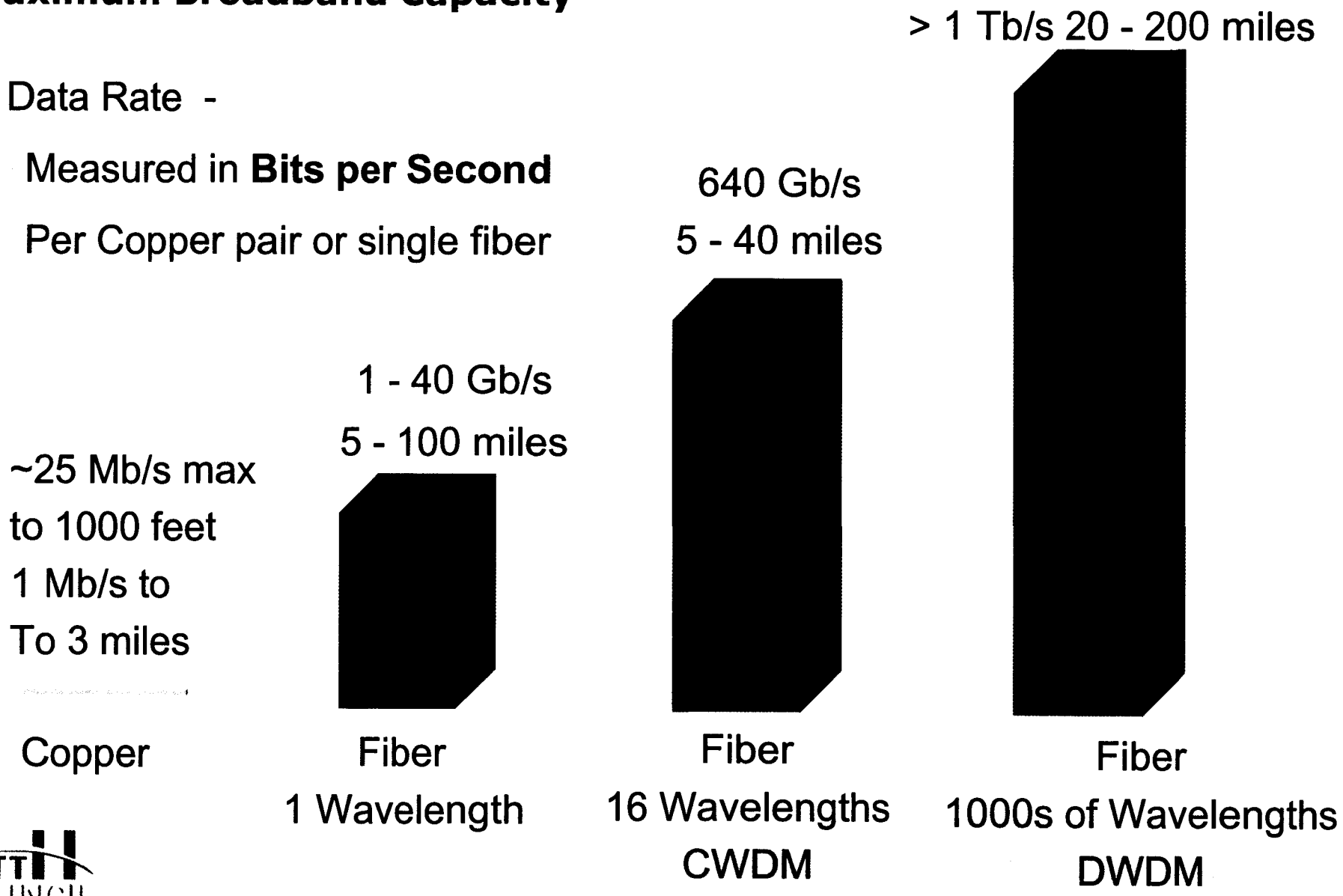
Only FTTP Can Meet Demand of Tomorrow

Maximum Broadband Capacity

Data Rate -

Measured in **Bits per Second**

Per Copper pair or single fiber



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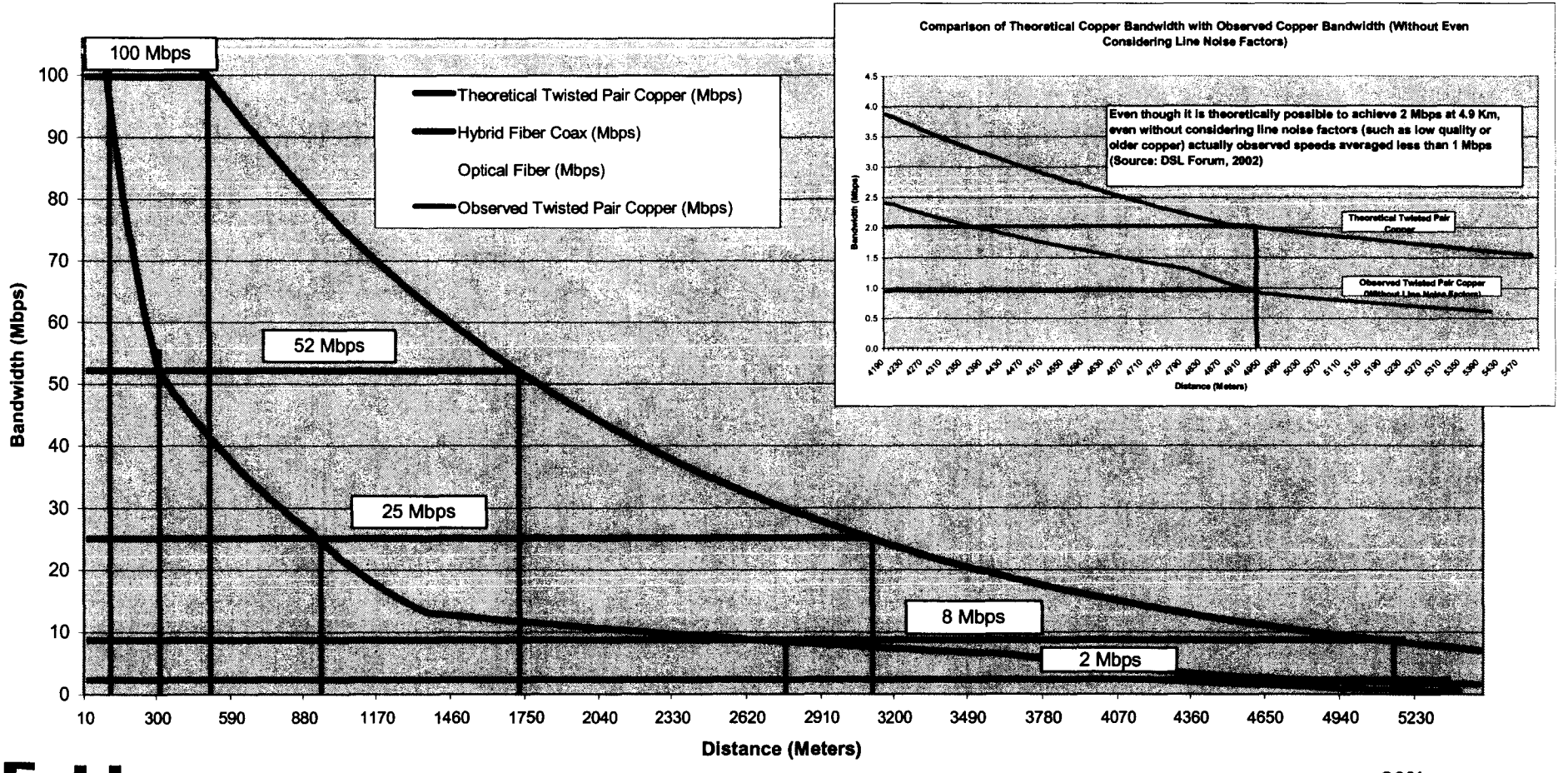
Copper and Coax Distance-Limited Options Only Allow You to Meet the Demand of Customers in Range

Distance Limitations of Various Bandwidth Supplying Media



<10% Customer Coverage

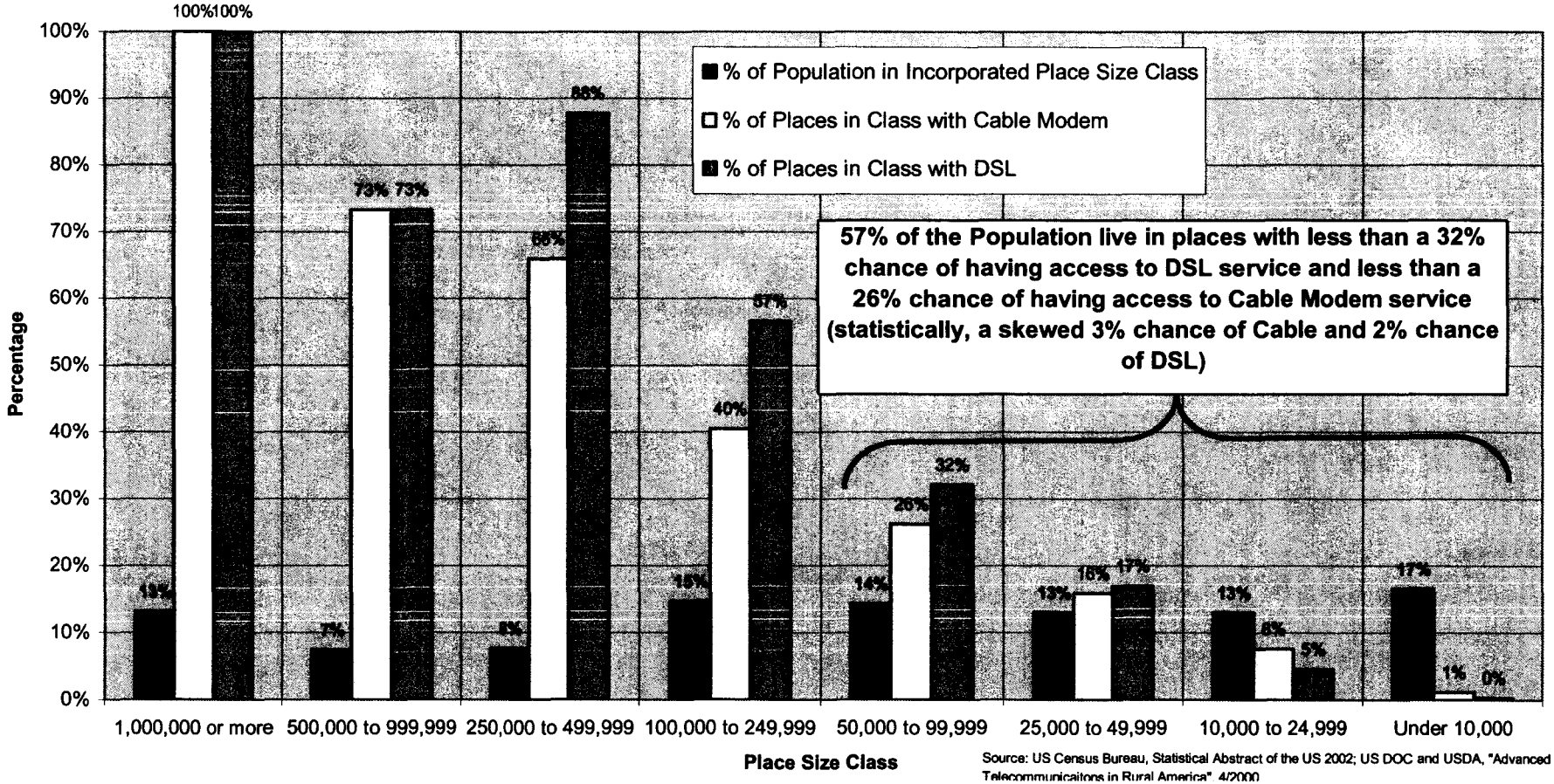
<25% Customer Coverage

<50% Customer Coverage

<90% Customer Coverage

Though Technically Feasible (<18,000 ft), Numerous CO's Are Uneconomical for Distance-Limited Technologies Given Population Densities

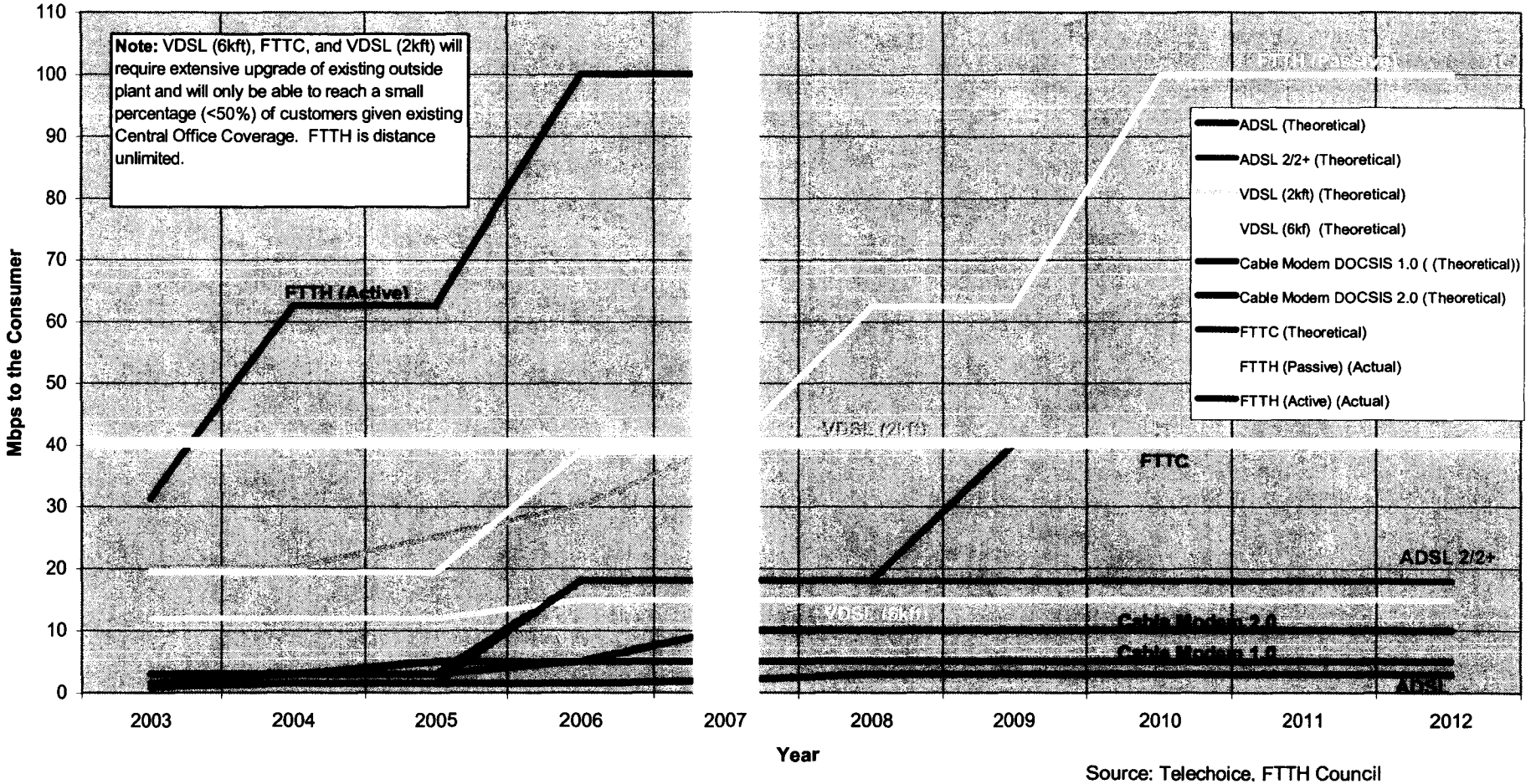
Population by Incorporated Place Size Class vs. Places in Size Class with Broadand



Source: US Census Bureau, Statistical Abstract of the US 2002; US DOC and USDA, "Advanced Telecommunicaitons in Rural America", 4/2000

Copper-Based Standards Flatline at 40Mbps
And Pass Only a Small Percentage Of US Population

Access Network Technology Standards Development Paths
All Copper Technologies Flatline at 40Mbps by 2007 (at Theoretical Best-Case)



Source: Telechoice, FTTH Council

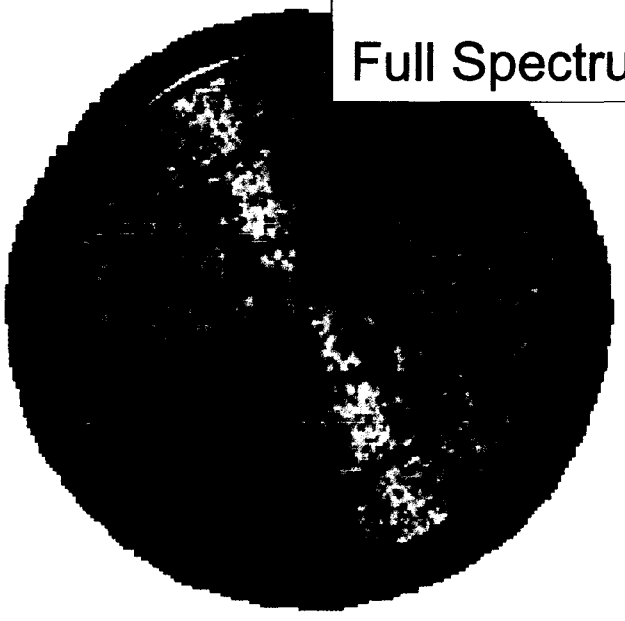
FTTP is Distance and Capacity Unlimited and Thus Can Provide Any Bandwidth Demand Growth To Any US Consumer

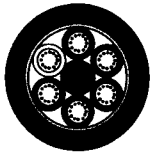
Benefits of FTTP

Greater bandwidth, smaller cables, lowest cost per bit

Fiber cable many times lower cost per bit vs. copper

Full Spectrum fiber 1.5 times lower cost per bit vs. std fiber





+

Std SMF

+

AllWave® Fiber

2400 Pair	72 Fiber	72 Fiber
Copper Cable	Typical Cable	MiDia® FX Cable
154 Mbps	1,800,000 Mbps	2,900,00 Mbps
$24 / ft	$1.00 / ft	$1.10 / ft

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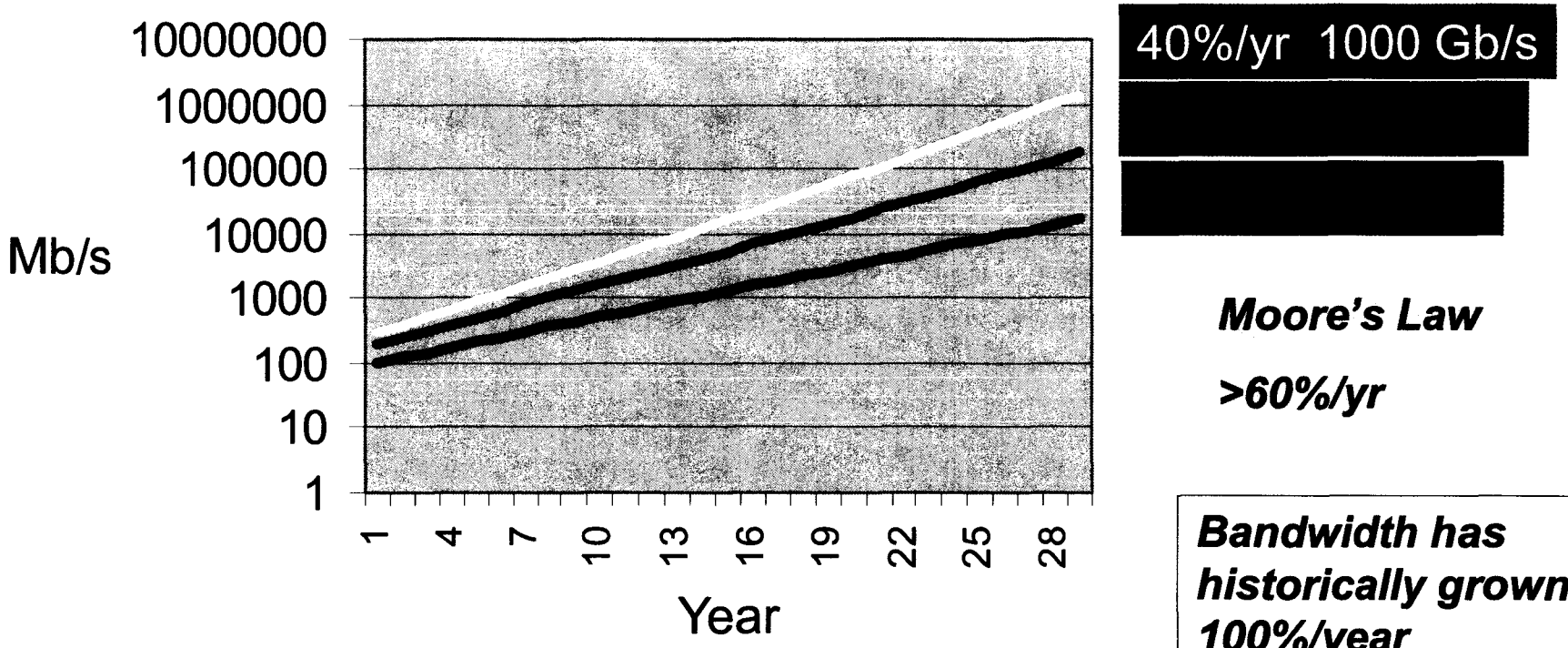
Why Fiber Over Copper or Coax?

Bandwidth must be supported over life of cabling system

Bandwidth Demand Potential over Life of Fiber



Bandwidth has historically grown 100%/year

Solution: Fiber that enables the lowest cost upgrade path to future high bandwidth demand (deploy infrastructure once)

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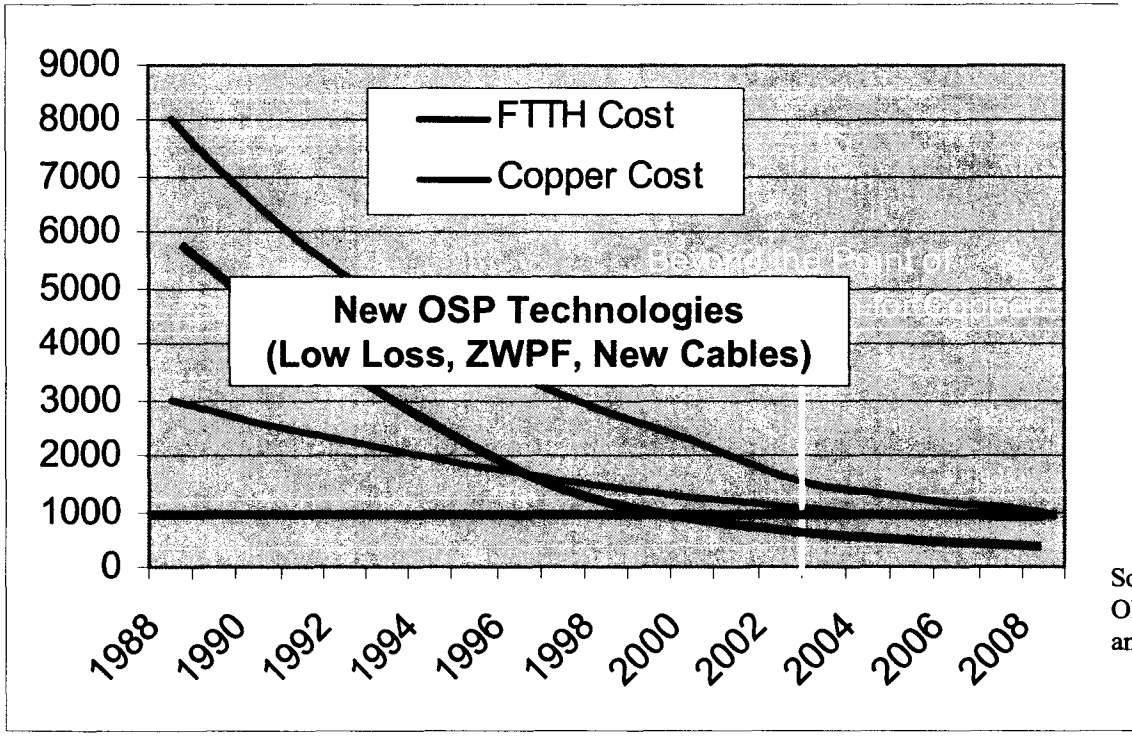
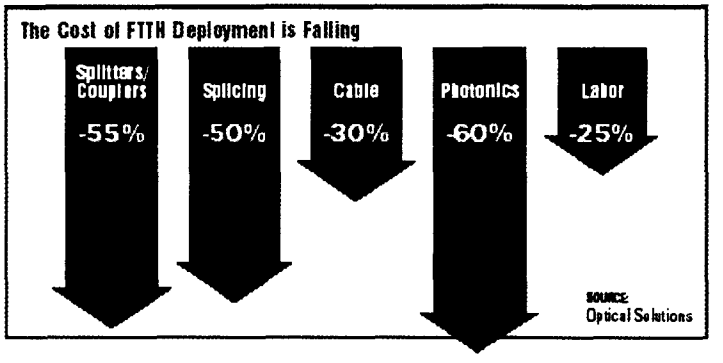
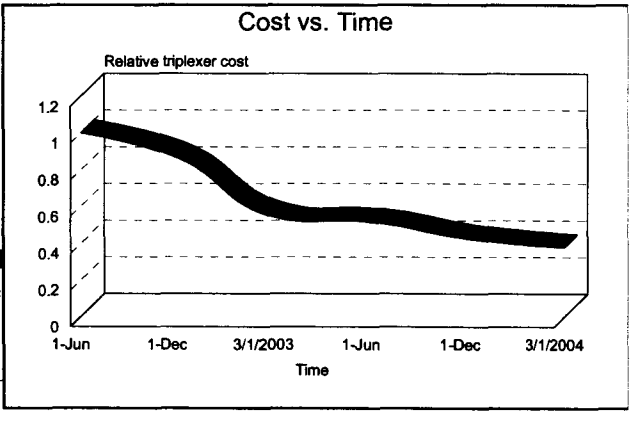
Why FTTP?

Fiber to the Premises Equipment Costs are Dropping







Source:
OFS and Ind
and estimate

1988 – 2000: Equipment and fiber cabling infrastructure innovation and volume
2000 – 2003: Cost innovation "dividend" resulting from R&D during the boom
2004 – 2008 + Volume deployments drive cost to equal copper

And Outside Plant (OSP) Costs Have Dropped Equivalently

Enabled by:
- Moore's Law
- Integration
- Optical Innovation

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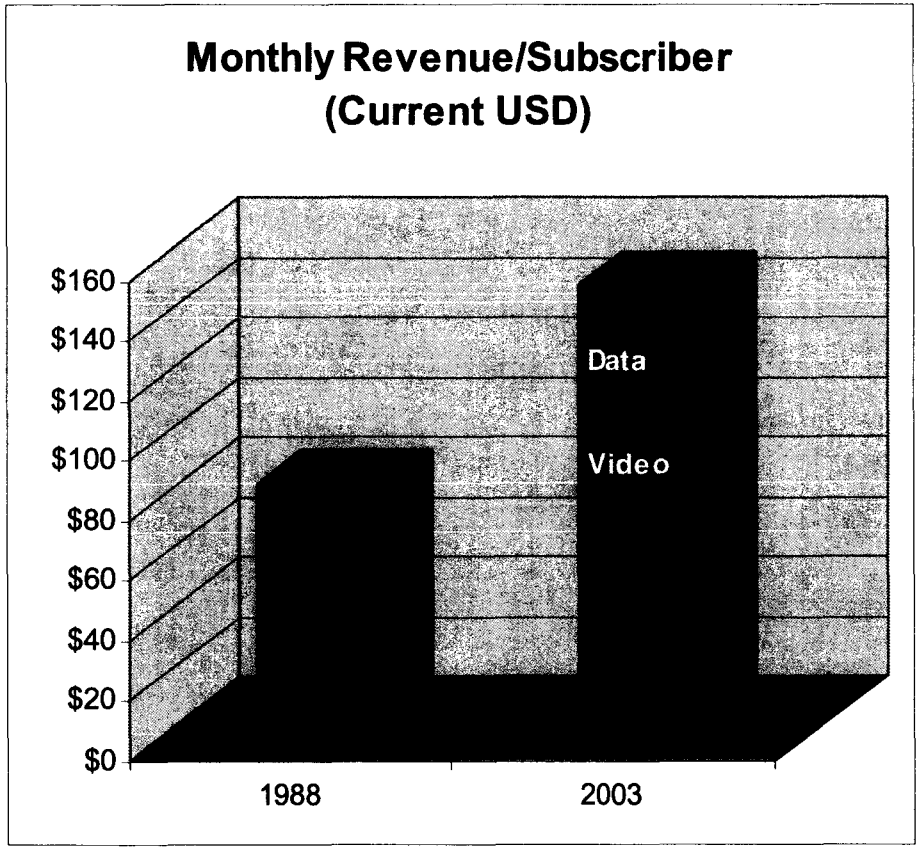
Enabling the Optical Broadband Business Case

Wireline Voice, Video, Data Revenues Double in 15 years



The Estimated Average Household "Bandwidth Budget" (2003)

Service	Average Cost	Expected Revenue
Telephone Line	$22	$26.40 (1.2 Lines/Home)
Long Distance Voice	$19	$19
Switched Access Voice	$9	$9
CLASS Services Voice	$7	$7
Basic Video	$34	$34
Digital Video	$13	$13
Premium Channel Video	$12	$12
VOD Video	$6	$6
Pay-Per-View Video	$9	$3.60 (40% of Subscribers)
Internet Access Data	$45	$45

Total Voice Revenue	$61.40
Total Video Revenue	$68.60
Total Data Revenue	$45.00

Total Revenue	$175.00

Capturing Reasonable Take-Rates of the "Bandwidth Budget" Can Swamp Deployment Costs and Easily Justify Facilities-Based Competitive FTTP

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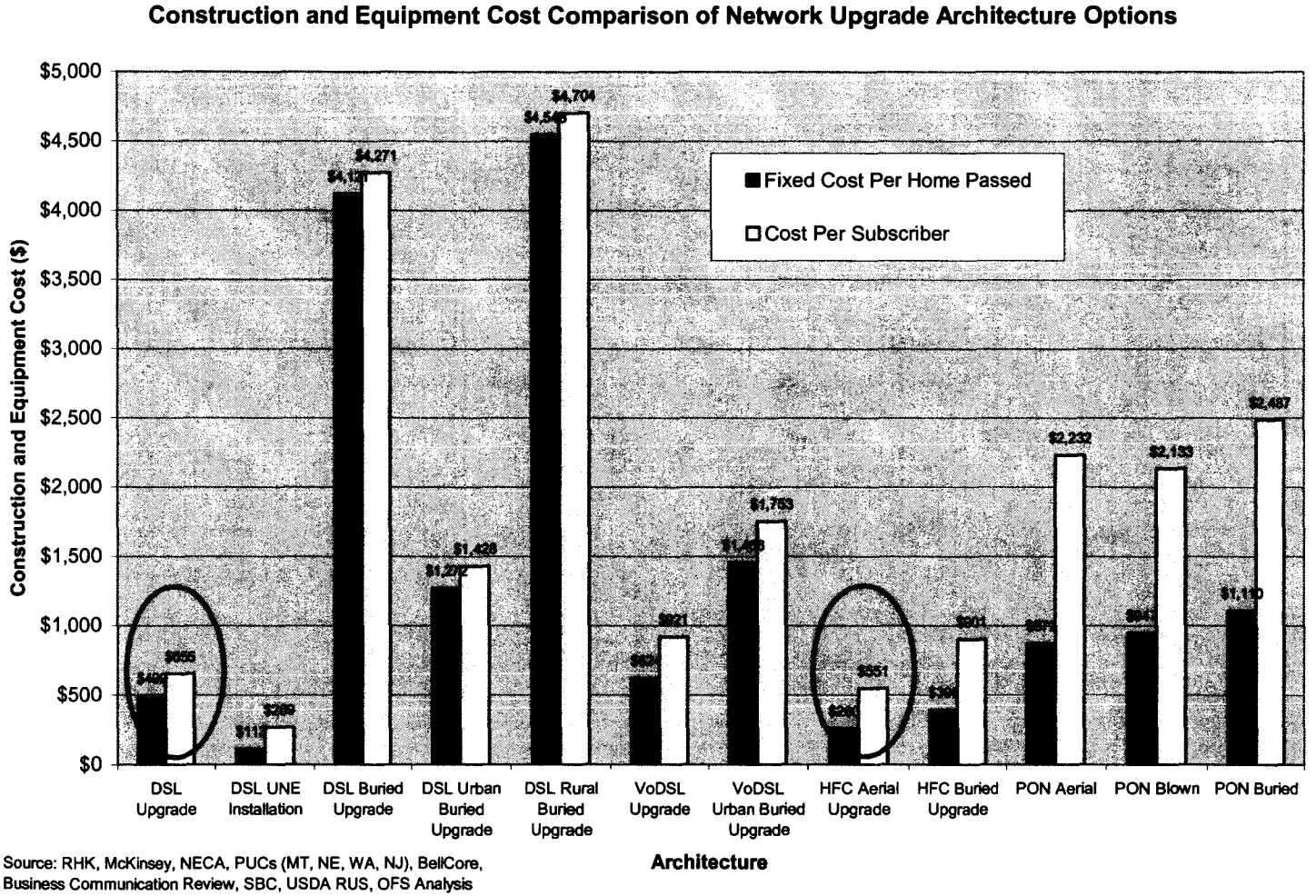
Through 2001, Only HFC Cost/Home-Passed was Cost-Effective for Widespread Deployment



Source: RHK, McKinsey, NECA, PUCs (MT, NE, WA, NJ), BellCore, Business Communication Review, SBC, USDA RUS, OFS Analysis

DSL CO-Upgrade's much higher Cost/Home-Passed combined with UNE-Ps, made it economical only when assured a very high data service take rate or high probability of voice revenue lost to CLEC or MSO competitors

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Cost/Subscriber Depends Heavily on Population Density of Customers

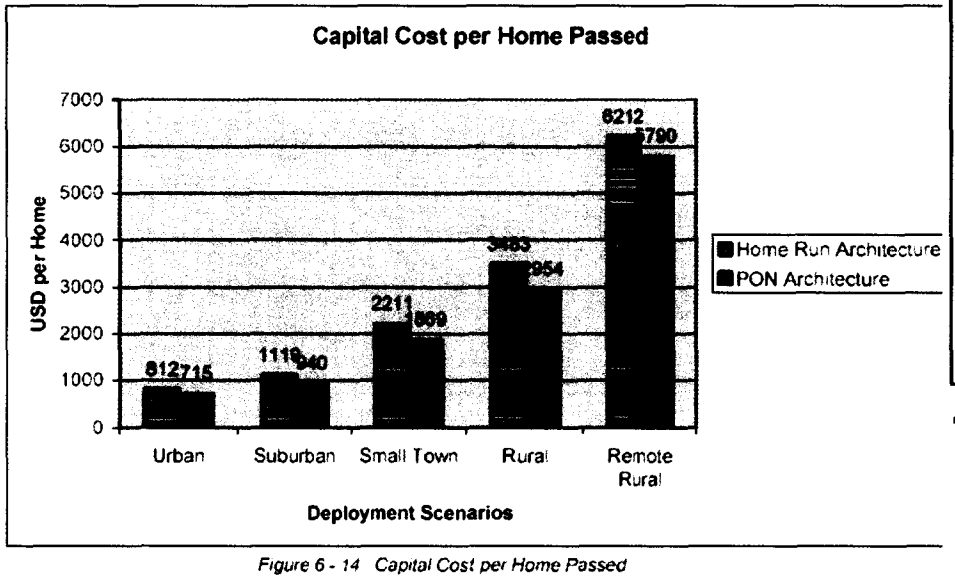


Figure 6 - 14 Capital Cost per Home Passed

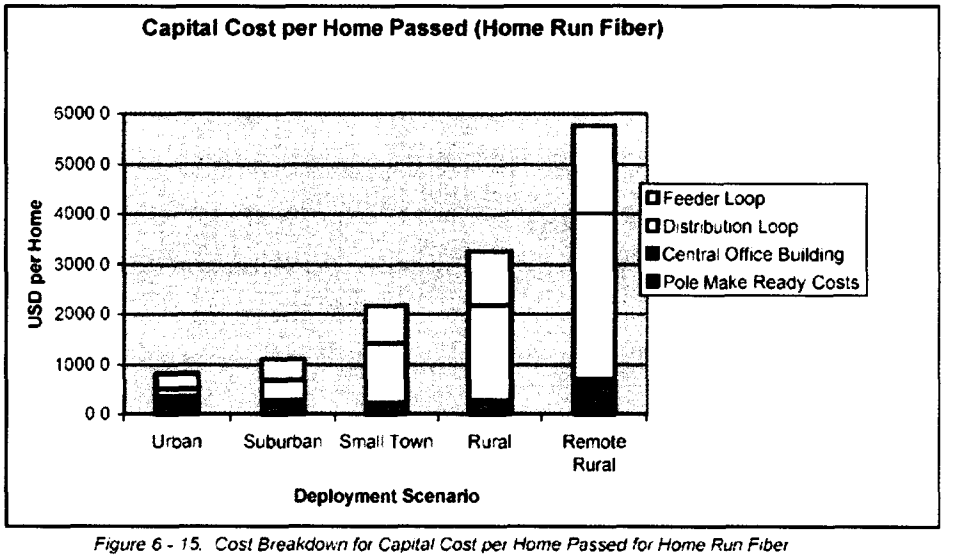


Figure 6 - 15. Cost Breakdown for Capital Cost per Home Passed for Home Run Fiber

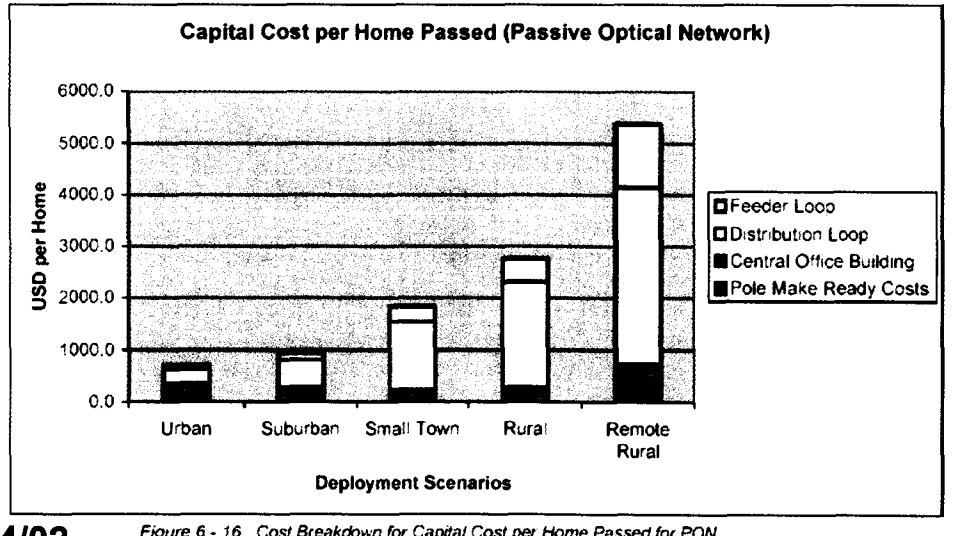


Figure 6 - 16. Cost Breakdown for Capital Cost per Home Passed for PON

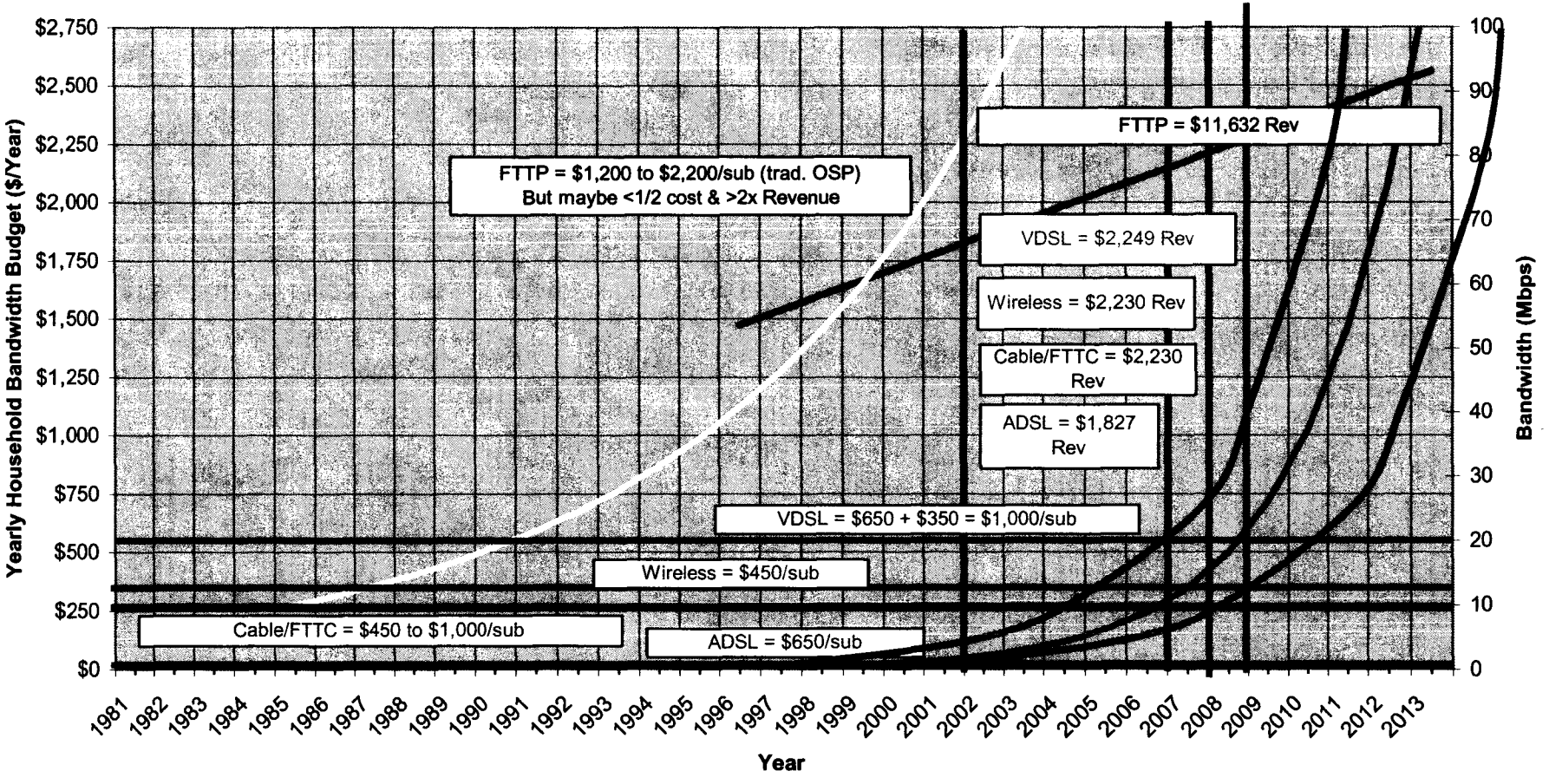
Outside the Urban Core, Labor Construction Costs of Distribution Dominate Cable Deployments

Source: Digital Rivers 4/02

The Carrier Telecom Investment Decision:

How Many Years Does Your Technology Buy Given Your BW Demand Growth?

Mainstream Bandwidth Demand Growth (50% of Population) vs. Technology Options and Their ROIs



Copper-Based Technologies Buy Only A Limited Number of Years of Bandwidth Growth At Costs Equivalent to FTTP

Technology	Cost per Subscriber	Years Technology Meets Average Bandwidth Demand (through 2013)	Revenue Over Effective Years	ROI (Total Revenue/Investment)
ADSL	$650	7 (1996-2004)	$1,827	281%
Cable HFC	$450	6 (2004-2009)	$2,230	496%
FTTC	$1,000	6 (2004-2009)	$2,230	223%
VDSL	$1,000	7 (2004-2010)	$2,249	225%
FTTP	$1,500	10* (2004-2013)	$11,632	775%

*** Note: FTTP is capacity unlimited and thus has an Effective Lifetime far greater than 2013**

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Even With Traditional OSP Technologies FTTP Costs More... But Is Definitely Worth It!

Access Architecture	Construction Cost Per Subscriber	Equipment Cost Per Subscriber	Total Cost Per Home Passed	Total Cost Per Subscriber	Years to Break-Even	10-Year Profit Per Subscriber
DSL Upgrade (50% Data)	$0	$655	$0	$655	6	$736
DSL Urban Greenfield (50% Data, 100% Voice)	$832	$596	$1,272	$1,428	5	$4,196
DSL Rural Greenfield (50% Data, 100% Voice)	$3,628	$643	$2,307	$4,271	19	($7,929)
HFC Aerial Upgrade (50% Data)	$244	$307	$95	$551	9	$113
HFC Buried Greenfield (50% Data, 100% Video)	$1,194	$307	$594	$1,501	9	$843
PON Aerial (50% Data, 50% Video, 100% Voice)	$494	$1,318	$272	$2,085	4	$7,232
PON Buried (50% Data, 50% Video, 100% Voice)	$1,124	$1,363	$510	$2,487	5	$7,036

The Assumed Household "Bandwidth Budget"	Service Cost	Expected Revenue
Telephone Line	$22.00	$26.40 (1.2 Lines per Home on Average)
Long Distance Voice	$19.00	$19.00
Switched Access Voice	$9.00	$9.00
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Basic Video	$34.00	$34.00
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Premium Channels Video	$12.00	$12.00
VOD	$6.00	$6.00
Pay-Per-View	$9.00	$3.60 (40% of Subscribers on Average)
Internet Access Data	$45.00	$45 (Regardless of Service Speed Provided)
	Total Voice Revenue	$61.40
	Total Video Revenue	$68.60
	Total Data Revenue	$45.00

Expense Assumption	Cost
Programming Costs	$40
PSTN Interconnection Costs	$40
Billing Costs	$18
Maintenance Costs	2.5%
Outside Plant Depreciation Time	20
Equipment Depreciation Time	10
Outside Plant Tax Rate	40%
Equipment Tax Rate	40%
Inflation Rate	2.50%
Interest Rate	10%
Real Discount Rate	107%

Sources: RHK; McKinsey; Infonetics; Synergy; NECA; BellCore; MT, NE, WA, NJ PUCs; Business Communications Review; USDA Rural Utilities Service; OFS
Assumes DSL does not provide Video services and HFC does not provide Voice services
Assumes a "Natural" Take-Rate of 50% for Broadband Data services, 50% for Digital Video Services, and 100% for Local and Long Distance Voice Services
Assumes Provider Investing in DSL or HFC Upgrades only receives income on the incremental revenue stream (Data) from the investment

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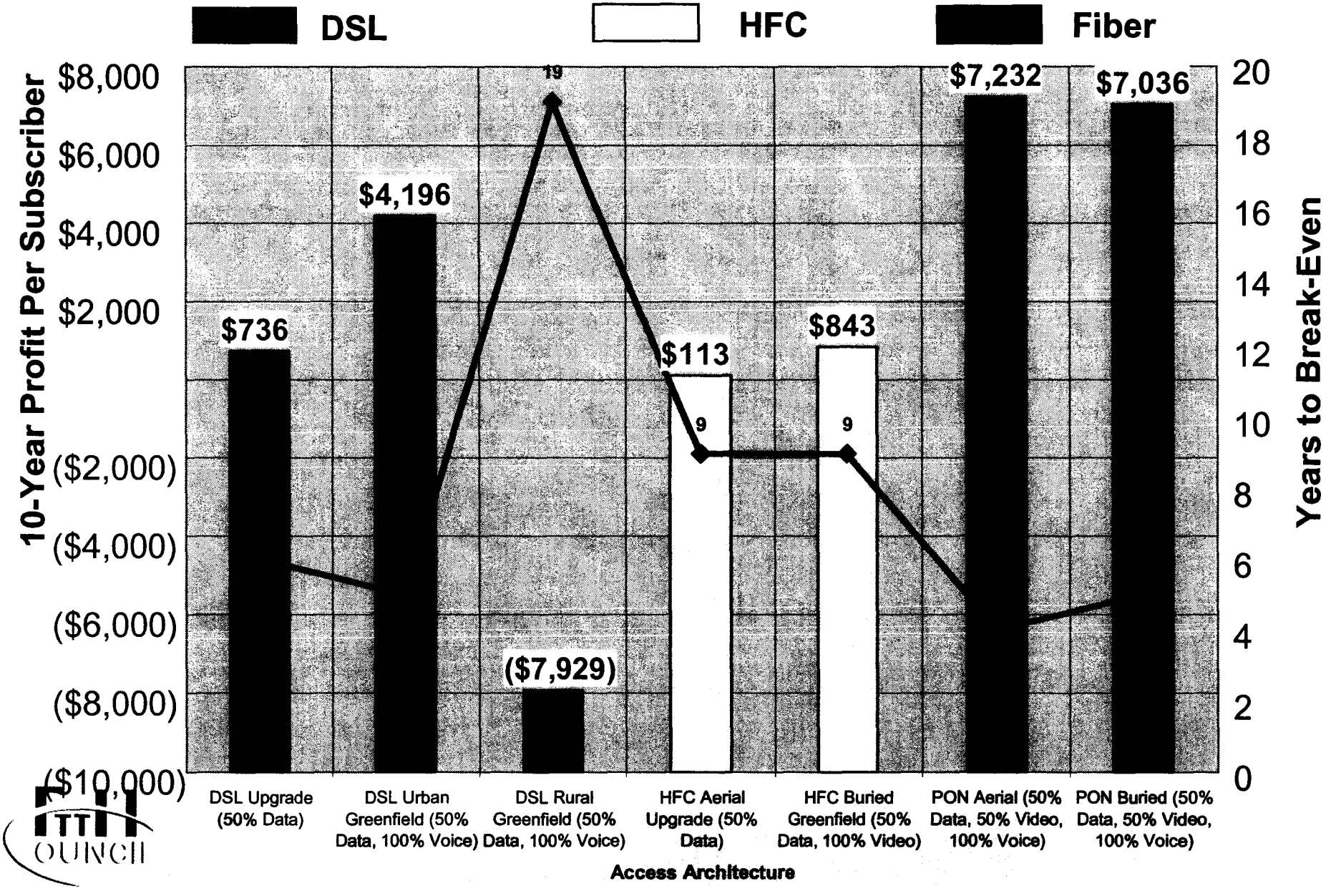
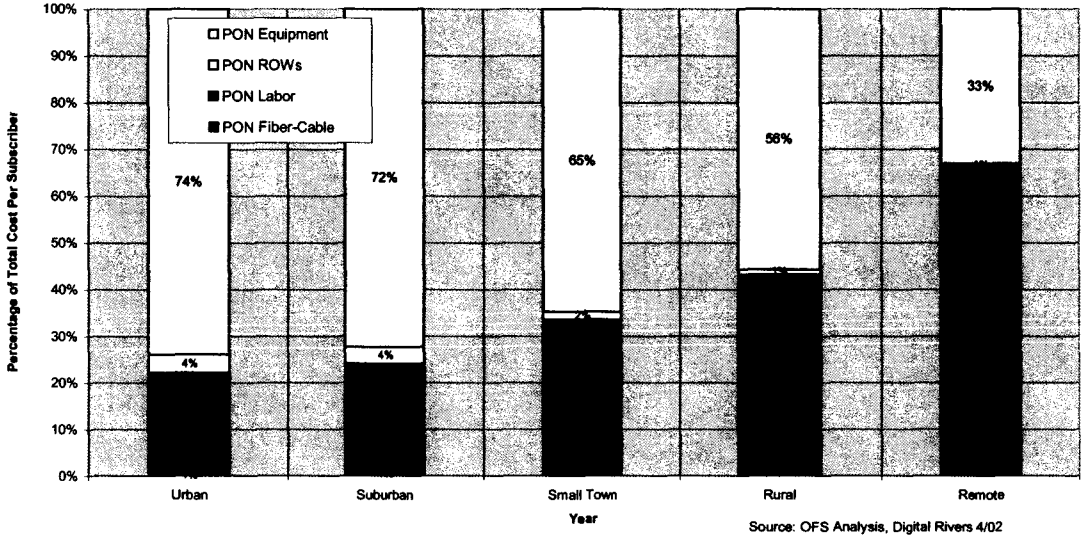
FTTP Only option providing Bandwidth For Future Applications, Rapid Break-Even, and 2 to 10 times Greater 10-year Profitability



Equipment Costs and Labor/Construction Costs Dominate FTTH Costs (Both Active and PON)

Percentage of Total Cost per Subscriber from PON Equipment, OSP, Labor, and ROWs

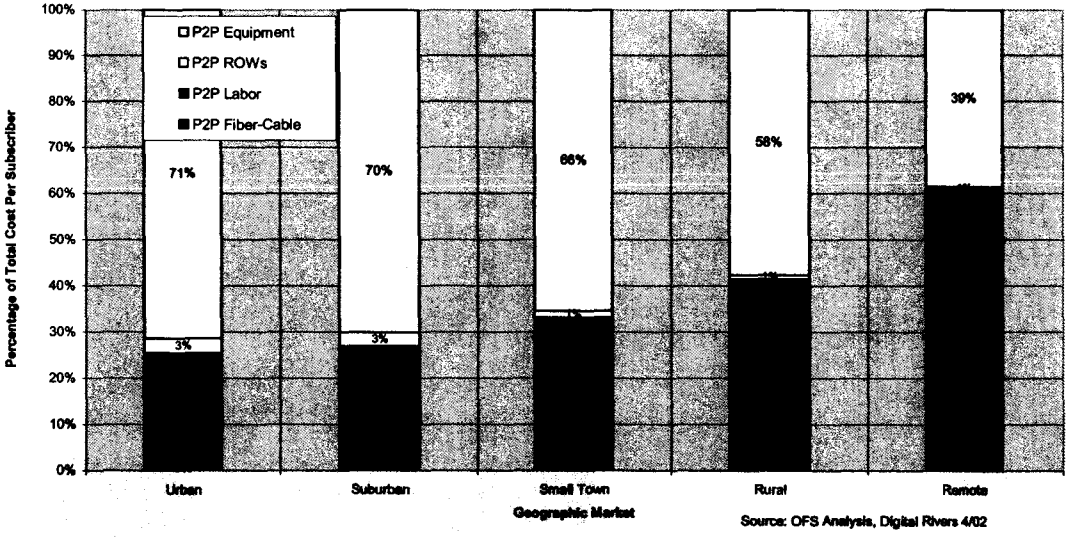


Source: OFS Analysis, Digital Rivers 4/02

Equipment Vendors Have Aggressively Lowered Prices Since 4/02

And OFS Has Innovated To Aggressively Lower Labor and Construction Costs

Percentage of Total Cost per Subscriber from Active Equipment, OSP, Labor, and ROWs



Source: OFS Analysis, Digital Rivers 4/02

FTTH COUNCIL

Using Traditional OSP Technologies:

FTTH Costs Range from $1,015 through $2,333 per Subscriber

FTTH Deployment Technology	Urban	Suburban	Small Town	Rural	Remote
New P2P (Home-Run)	$1,259	$1,282	$1,373	$1,559	$2,333
New P2MP (Active Star	$1,190	$1,213	$1,304	$1,490	$2,264
New PON	$1,015	$1,037	$1,157	$1,347	$2,268

Innovative OSP Technologies that enable the use of existing ROWs and that double the reach can drop that range to $630 through $1,006 per Subscriber

FTTH Equipment and OSP Technologies	Urban	Suburban	Small Town	Rural	Remote
New P2P (Home-Run)	$1,259	$1,282	$1,373	$1,559	$2,333
Existing ROW P2P (Home-Run)	$1,006	$1,017	$1,007	$1,041	$1,124
Existing ROW P2P 2xReach (Home-Run)	$898	$902	$865	$844	$694
New P2MP (Active Star)	$1,190	$1,213	$1,304	$1,490	$2,264
Existing ROW P2MP (Active Star)	$937	$948	$938	$972	$1,055
Existing ROW P2MP 2xReach (Active Star)	$829	$833	$796	$775	$625
New PON	$1,015	$1,037	$1,157	$1,347	$2,268
Existing ROW PON	$762	$772	$791	$829	$1,059
Existing ROW PON 2xReach	$655	$657	$649	$631	$630

Source: OFS Analysis, Digital Rivers 4/02

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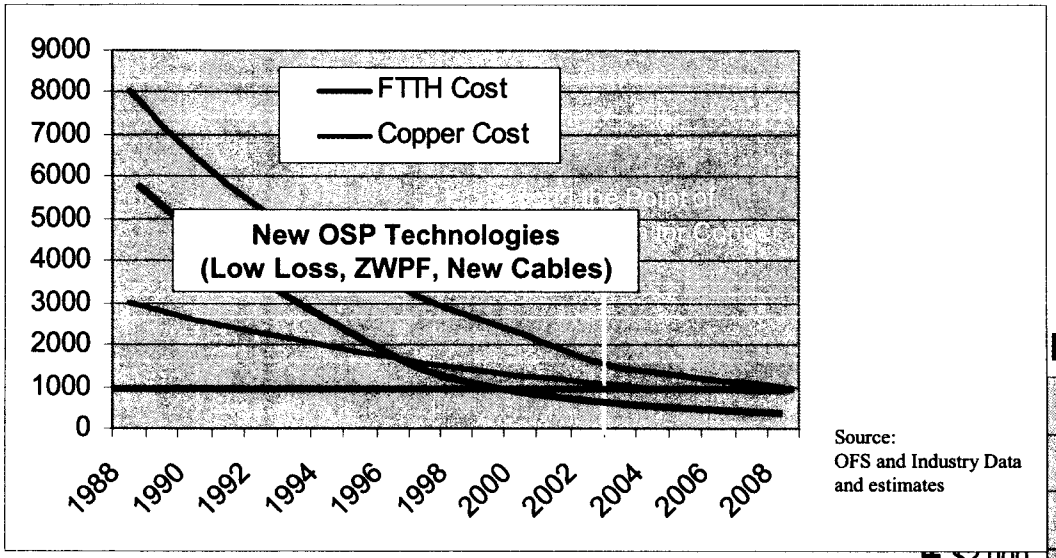
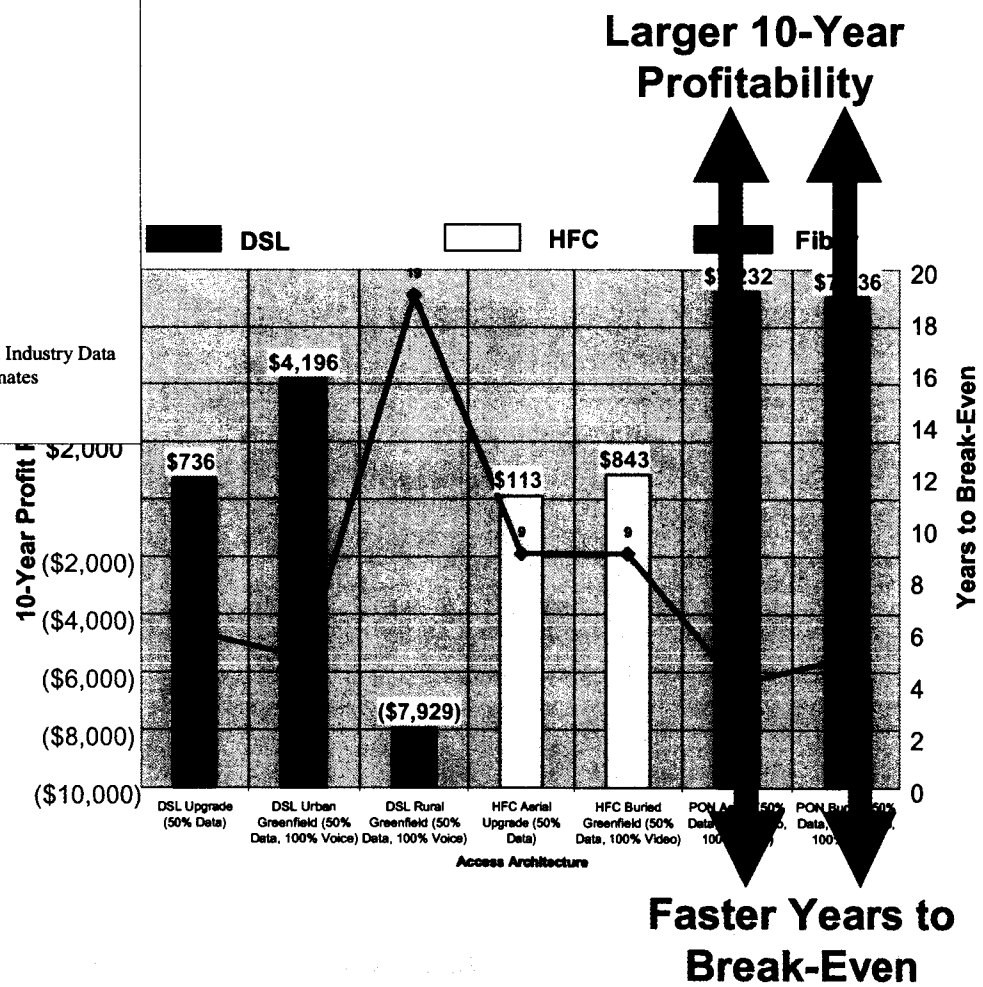
Lower Cost/Subscriber + Higher Revenues:
New OSP Technologies Make the Business Case Even Better!

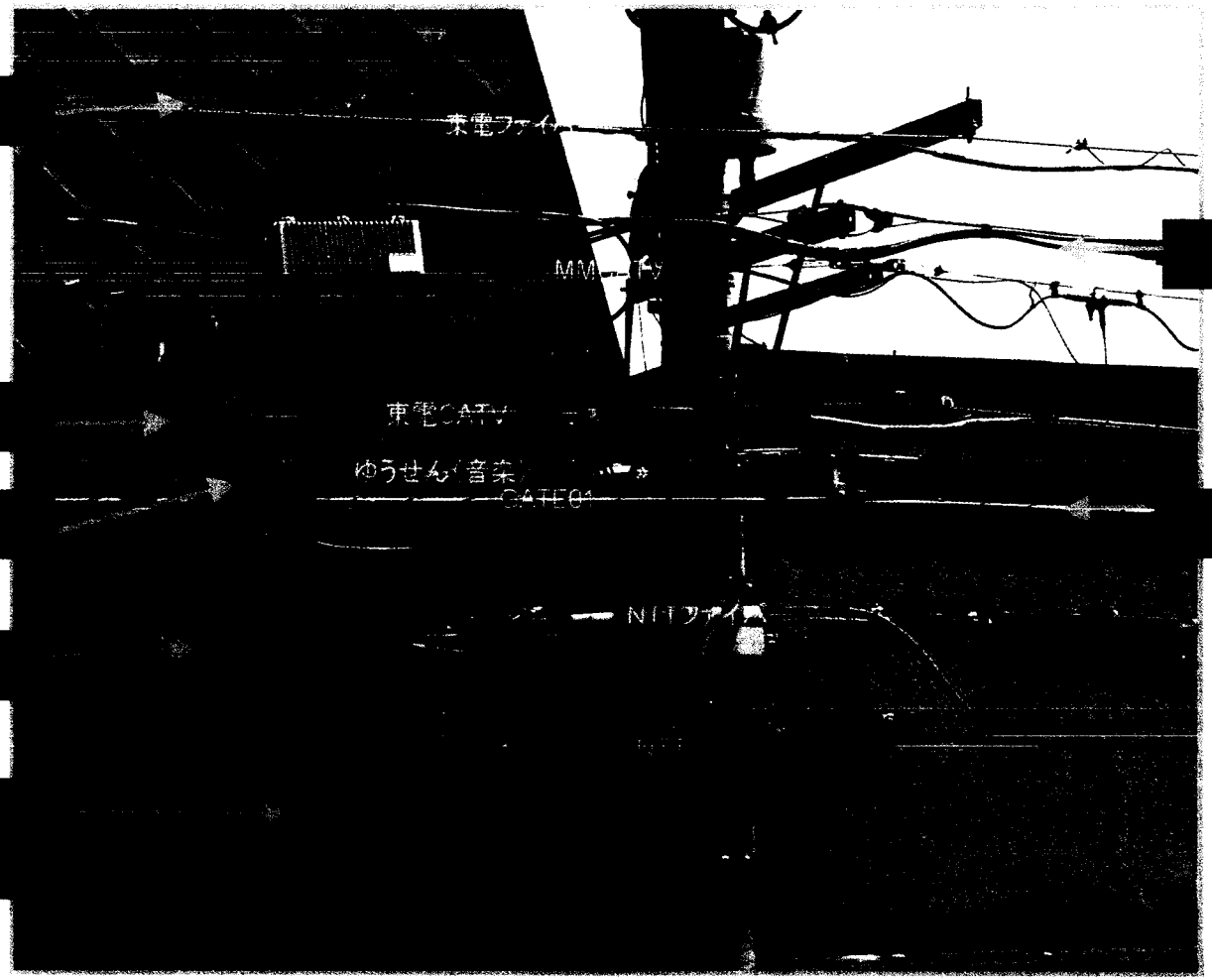


Source:
OFS and Industry Data and estimates



FTTH Facilities-Based Competition Exists

Downtown Tokyo



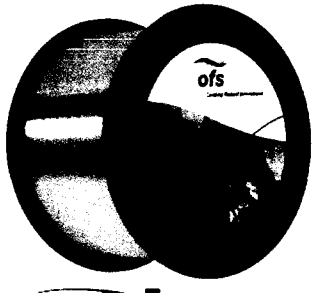
Multiple fibers passing the same homes!

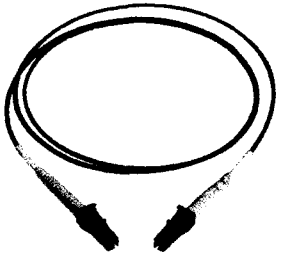
Source: Fujikura

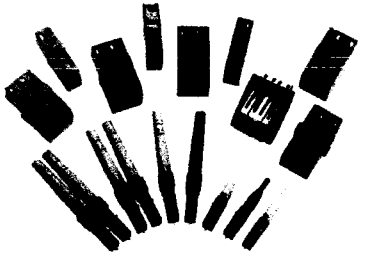
Enabling the Optical Broadband Business Case

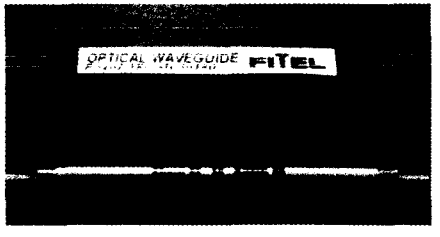
Facilities based competition and lower cost enabled by Optical Fiber and cabling Innovations

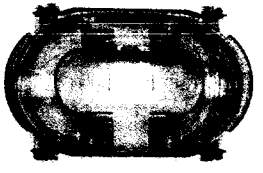
- Addditional ROW options: Gas, Powerline "Hot Zone" and sewer.
- New "Microcables" can be installed at low cost in existing ducts
- "Blown" cabling systems enable incremental investment
- Full Spectrum Fibers enable 50% greater bandwidth with lower cost optics for Wavelength Services.
- Low cost and low labor connectors speed installation.
- Dry cables lower installation cost.
- Low-Loss 2x Reach Systems Lower Cost 30% by Shifting From More Feeder Plant to Distribution Plant.











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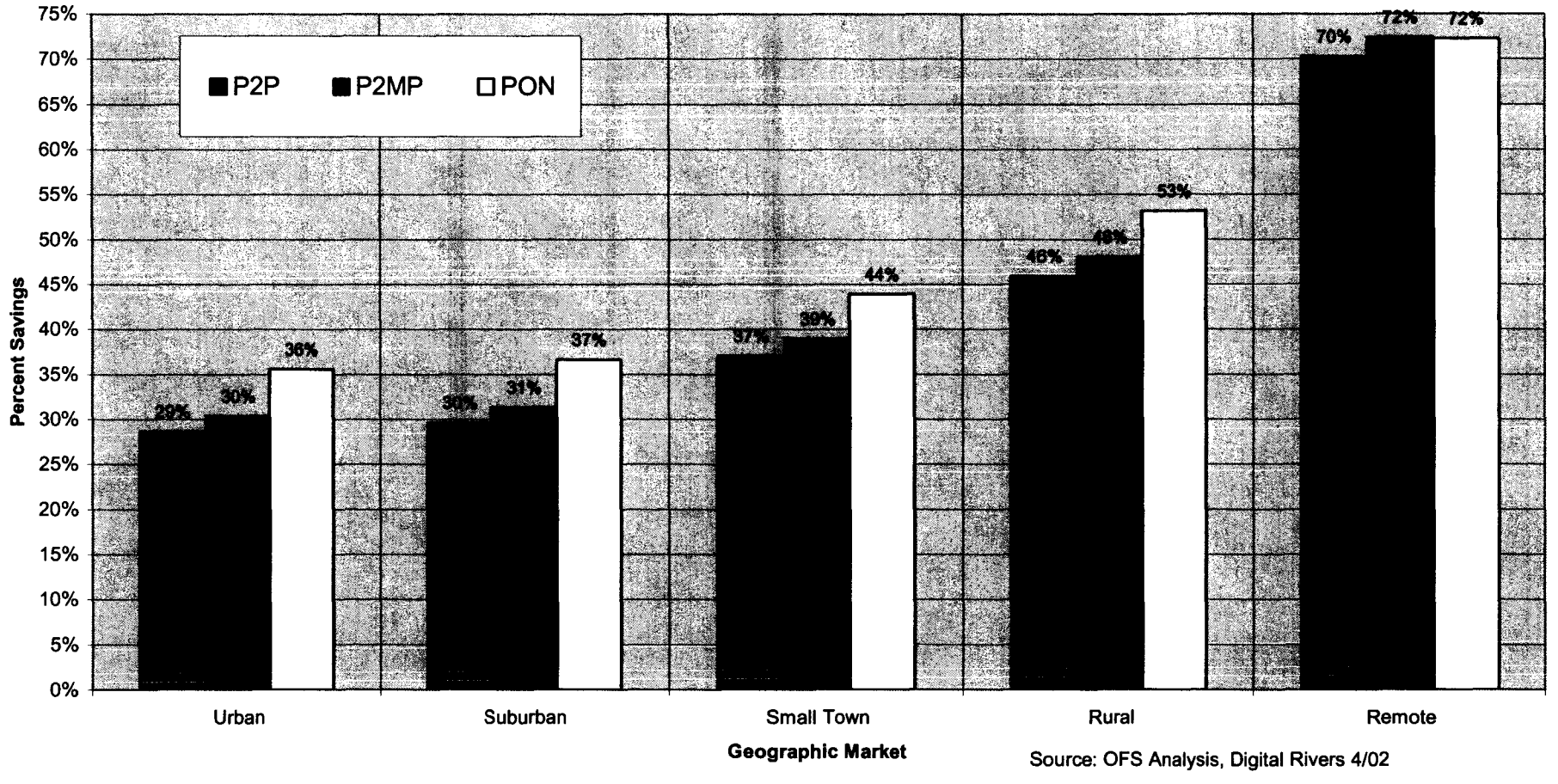
OSP Innovations Can Save Carriers Between 29% through 72% per Subscriber!

Total Cost per Subscriber Savings from New OSP Technologies (Use Existing ROWs and 2xReach)



Source: OFS Analysis, Digital Rivers 4/02

Not to mention the additional Revenue provided by 16-channel CWDM Enterprise Edge Networks and the ability to reach 2x the customers!

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