

# Financing Telecom Infrastructure: *How Wall Street Sees Telecom*

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# Issues of Interest to Investors

## *-Allocating Revenues and Costs*

- Major Telecom Reform Legislation
- Net Neutrality
- Telco Entry to Video
- Universal Service/Access Charges/Inter-Carrier Compensation
- Spectrum Availability/Auctions
- 911, CALEA Compliance Costs
- Etc.

# But, an Overarching Issue for Investors (and Regulators):

Was the Telecom “Bust” a One-Time  
*“Perfect Storm”*  
or  
Symptom of  
*Fundamental Instability?*

# CITI's Conclusion:

## Fundamental Instability

- Combination of competition and economies of scale
  - Attempts to gain advantage of scale lead to **overcapacity in supply**
- Products and services with commodity characteristics
- Low marginal, high fixed costs leading to **price wars**
  - Inelastic demand
  - **Price deflation**
- Wall Street's short term perspective
- Continual technology shocks

# Wall Street Sees Same Volatility

“Telecom is a highly volatile sector. ...

...the communications industry is brutally competitive and plagued by short product cycles and thin profit margins.

‘It's a real boom-and-bust, roller-coaster business,’ [the Morningstar analyst] says.”

So, Wall Street Analysts Are Not  
Enthusiastic About Telecom

# Expecting '07 Underperformance (*vs. overall stock market*)

“The fundamentals suggest another year [2007] of underperformance...with wireline businesses facing slowing top lines and pressured margins while wireless industry growth slows. ... Line loss and price cuts are heating up as telecoms attempt to shore up customers with DSL ahead of wireless and VoIP competition. Integration of several large scale mergers adds complexity to operations.”

# Another Cautious Outlook

## “Generally equal-weight to slightly underweight U.S. Telecom Services

- Competition, uncertain regulatory structures, **increasing capex spends** lead us to cautious stance on sector
- **Fiber builds by RBOCs unlikely to have positive ROIs**; loss of voice share not likely to be offset by video share gains

## We prefer several RLECs over RBOCs

- In particular, high-payout RLECs—for U.S. wireline exposure, 6%-8% sustainable yields are not unattractive; less competition and less regulatory risk

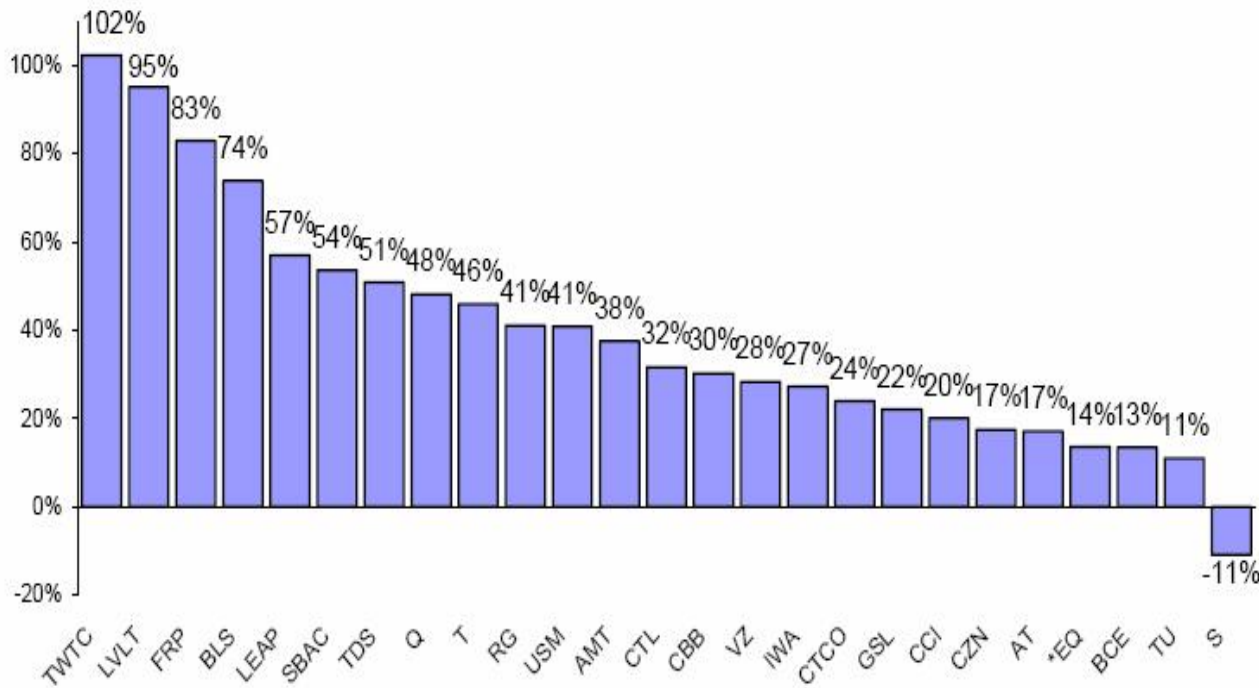
## We are generally cautious on U.S. Wireless

- Declining growth as U.S. approaches 75% penetration
- **3G Builds unlikely to have positive ROIs in near future**
  - Disappointing take rates for 3G services throughout the world thus far
  - We are cautious on demand for video and music download demand at current pricing levels



**But Investors, Who Did Well in  
2006, Are More Positive**

# 2006 Was Good for Telecom Investors



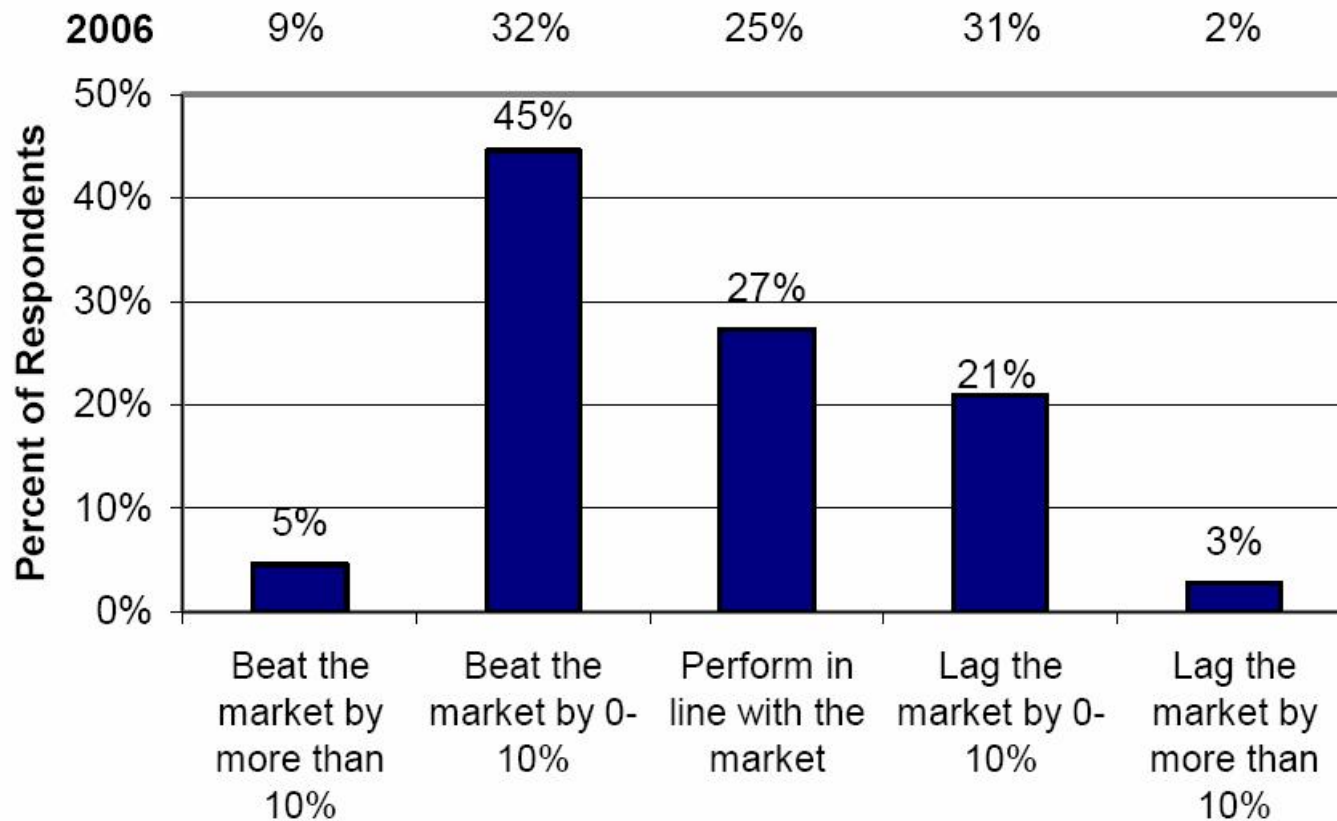
The Telecom Services industry was strong in 2006 with all the stocks except Sprint rising. The AT&T acquisition announcement of BellSouth, positive earnings revisions, and further M&A announcements have helped to drive performance last year.

Level 3 and Time Warner Telecom have had strong outperformance this year due to price stabilization and increasing bandwidth demand.

# Improving Investor Sentiment

## 2007 Investor Outlook More Positive than 2006

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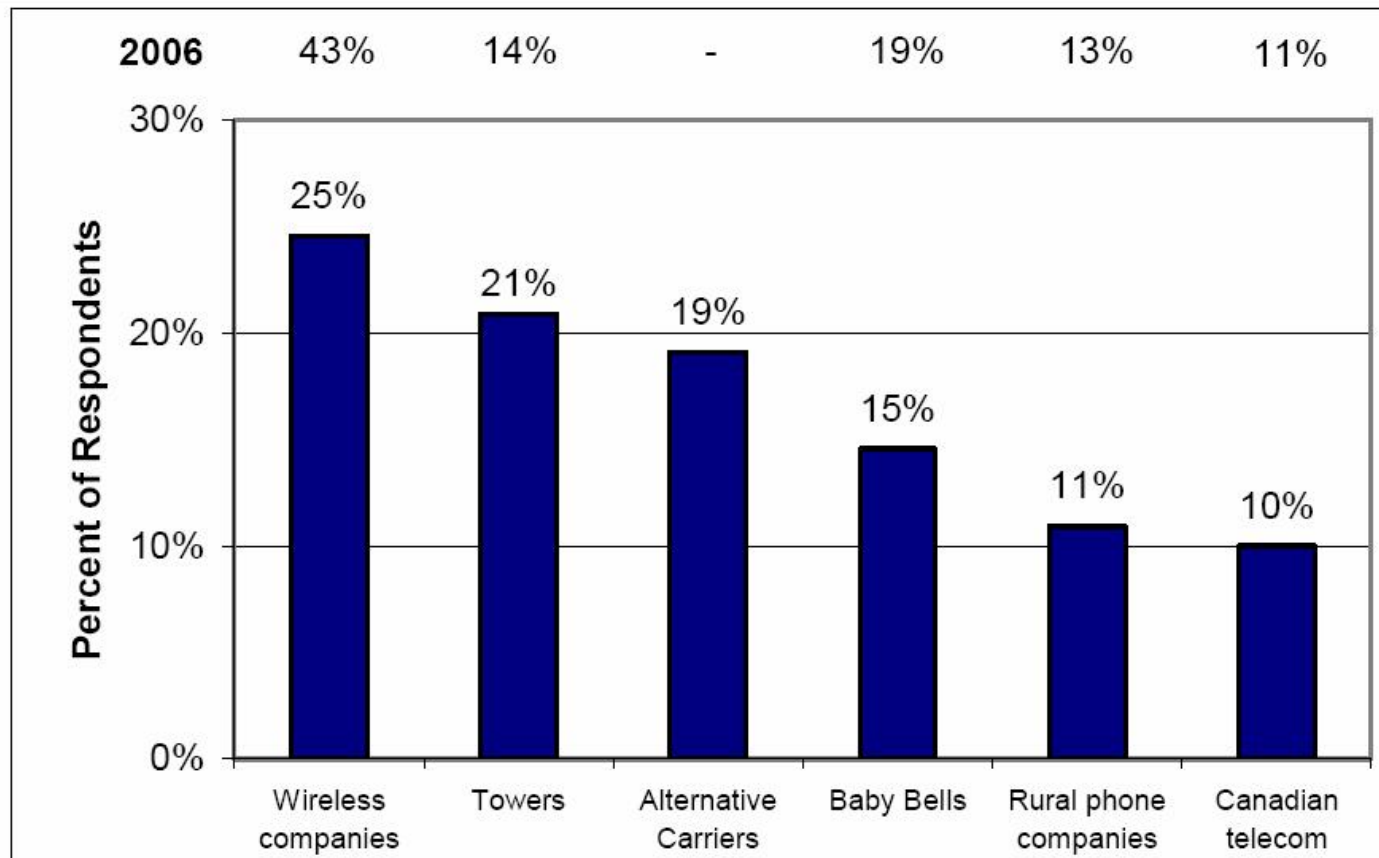


Source: Morgan Stanley, "Telecom Services- Annual Investor Survey: 2007 Outlook," Jan. 11, 2007

# Investors' Sector Expectations

*(Q: Which sub-sector do you expect to perform best in 2007?)*

## Wireless Preferred Again, but Less than in 2006



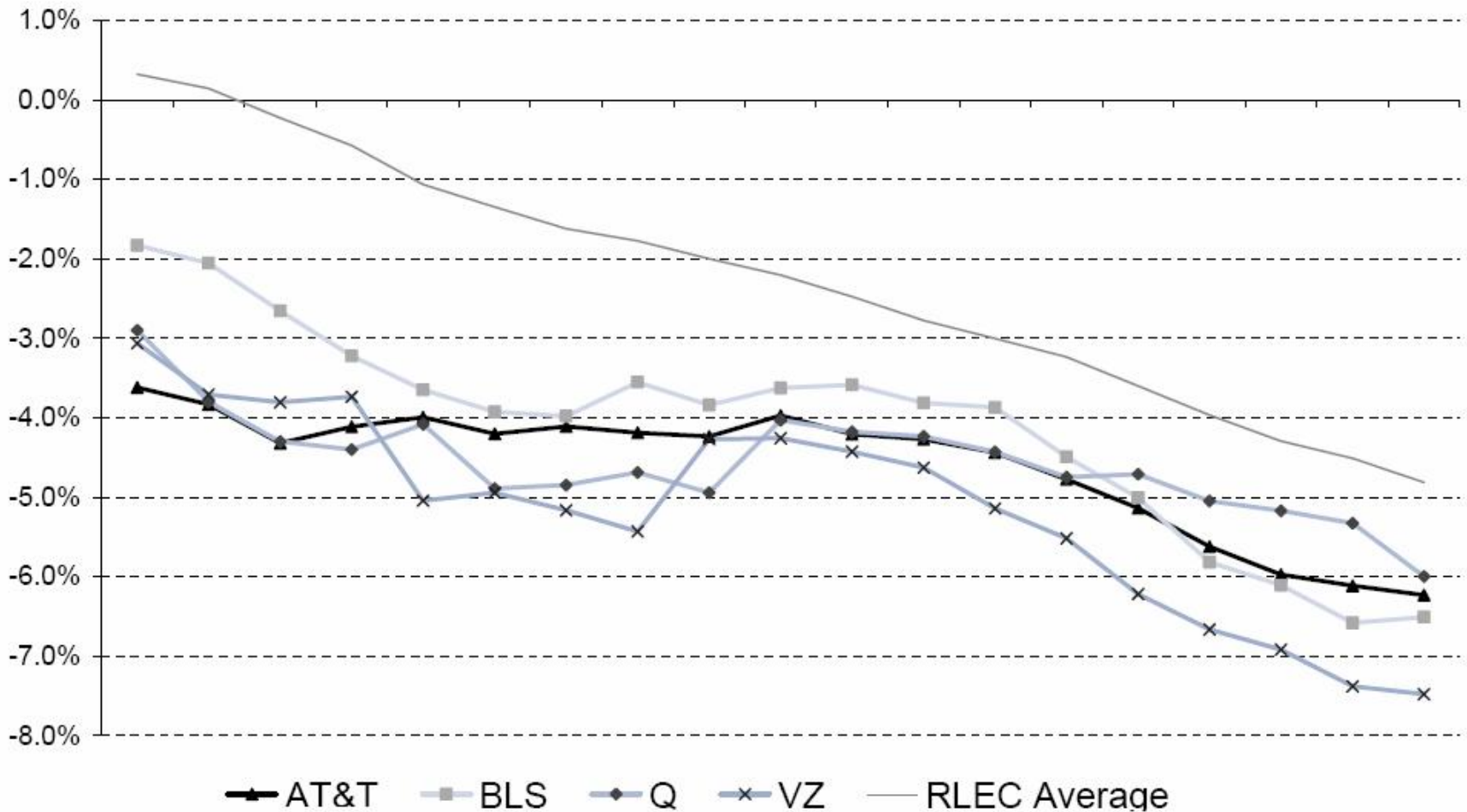
Source: Morgan Stanley, "Telecom Services- Annual Investor Survey: 2007 Outlook," Jan. 11, 2007

# The Big Picture

*What Analysts and  
Investors Are Seeing*

# ILEC Access Line Erosion

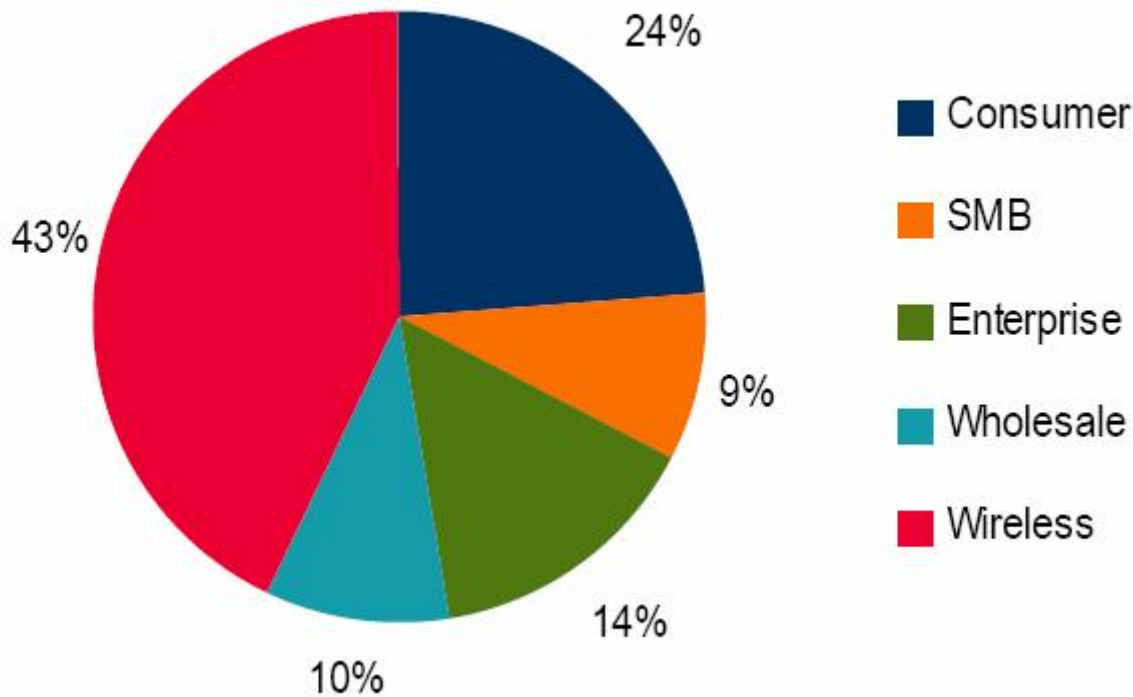
(1Q'02-3Q'06)



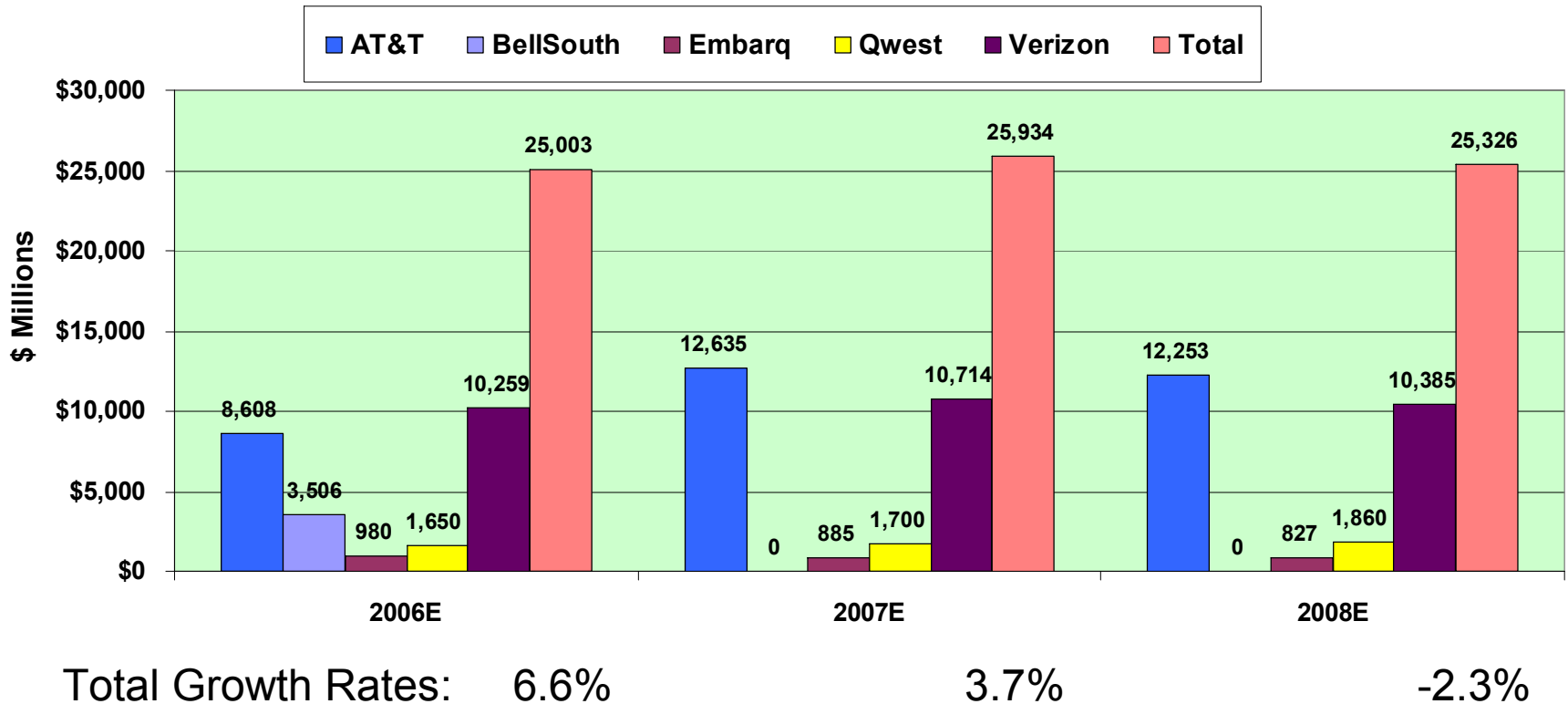
Source: Goldman Sachs, "3Q2006 US Telecom Services Review," Nov. 2006

# Telecom Industry Revenue Mix

*Consumer Wireline Shrinking,  
Growth in Competitive Sectors*



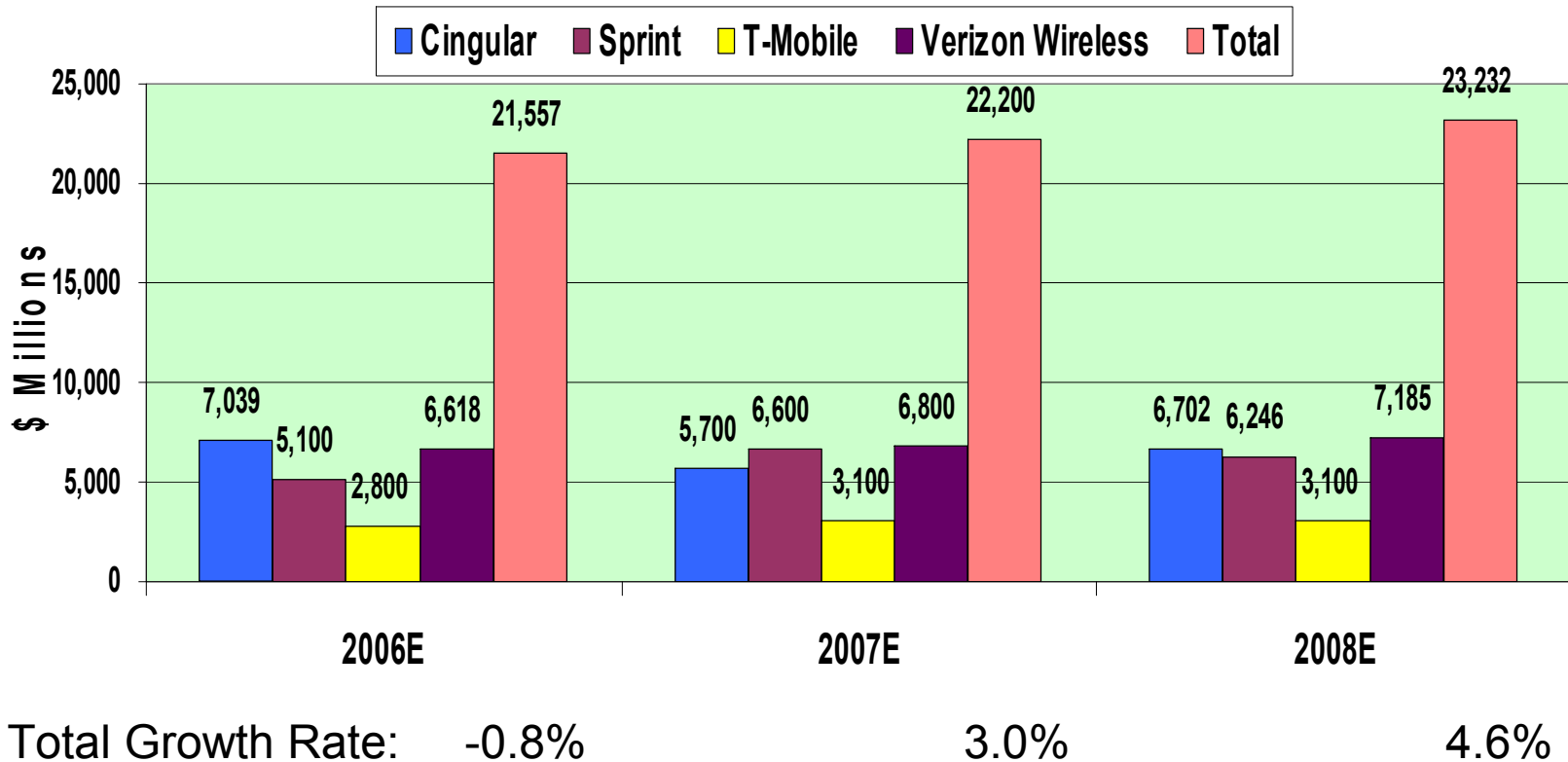
# Wireline CapEx Forecast



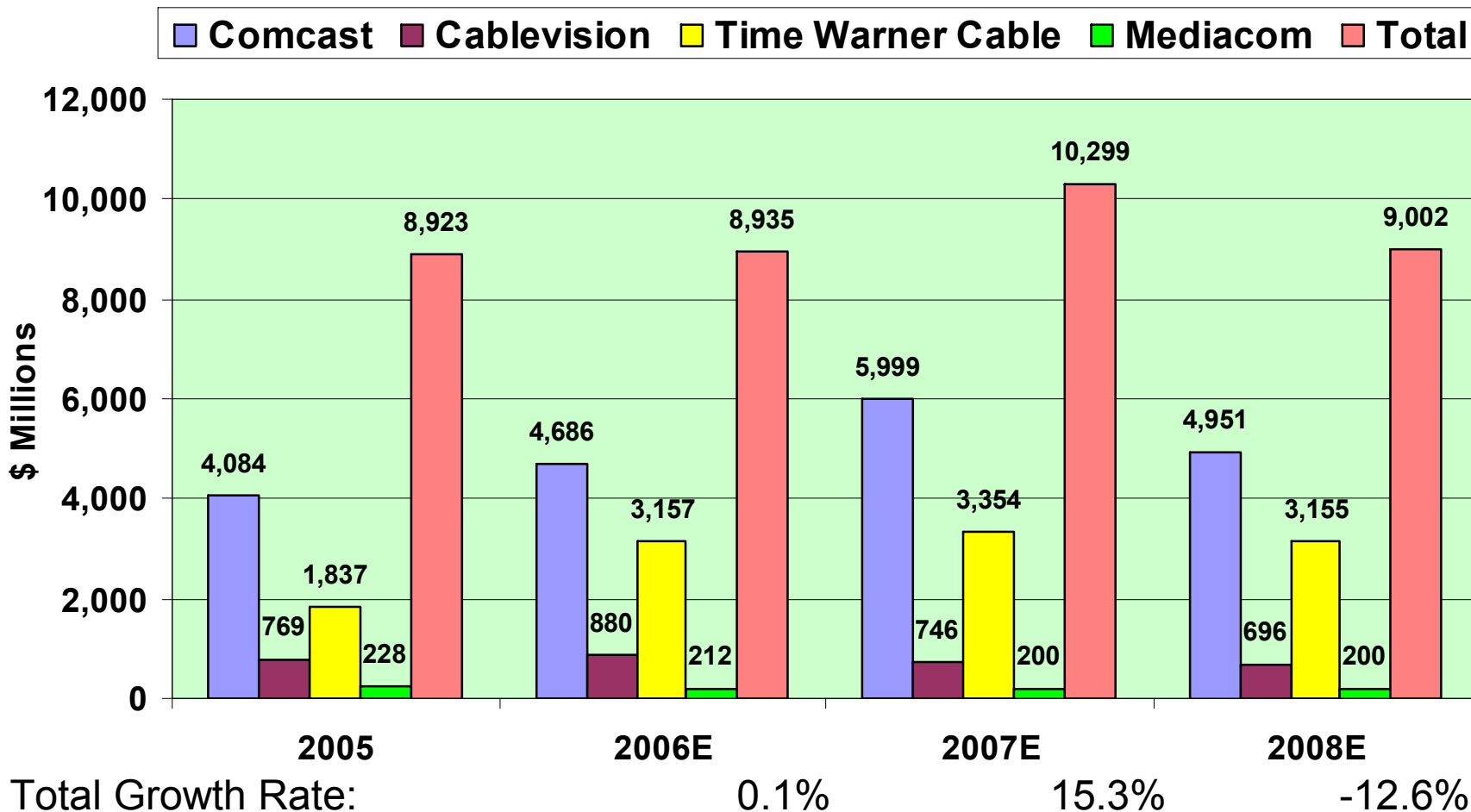
Source: Merrill Lynch, Feb. 5, 2006



# Wireless CapEx Forecast



# Cable CapEx Forecast



# Supplier's Forecast of US Telecom Service Providers' Spending (CapEx and OpEx)

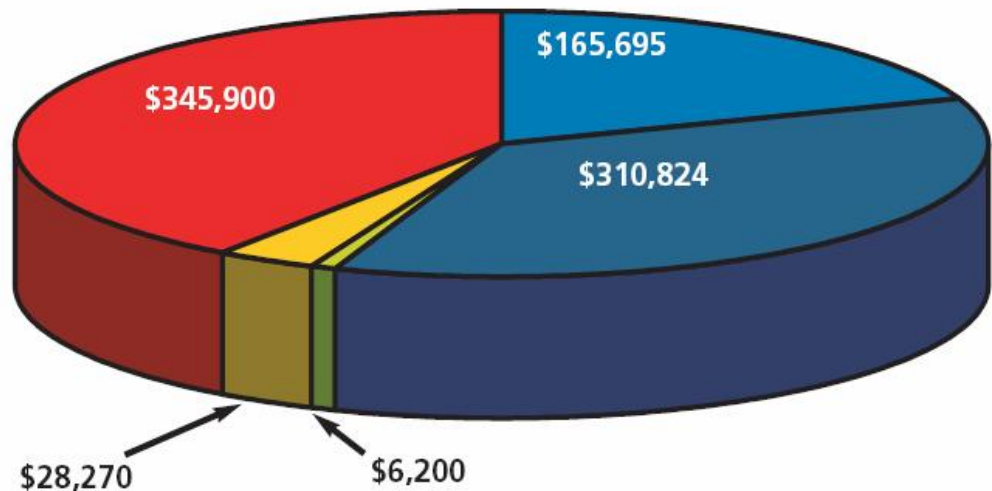
The U.S. Telecommunications market will grow at a projected 9.0 percent compound annual rate from 2006 to 09, reaching \$1 trillion in 2009.

## The 2005 U.S. Telecommunications Market (\$ Millions)

**Total: \$784,501** (7.9% increase)

Category	Increase over 2004 (%)
----------	------------------------

Equipment & Software	5.4
Transport Services	4.2
Specialized Services	13.8
Internet Access	10.2
Support Services	15.0



Source: TIA's 2006 Telecommunications Market Review and Forecast

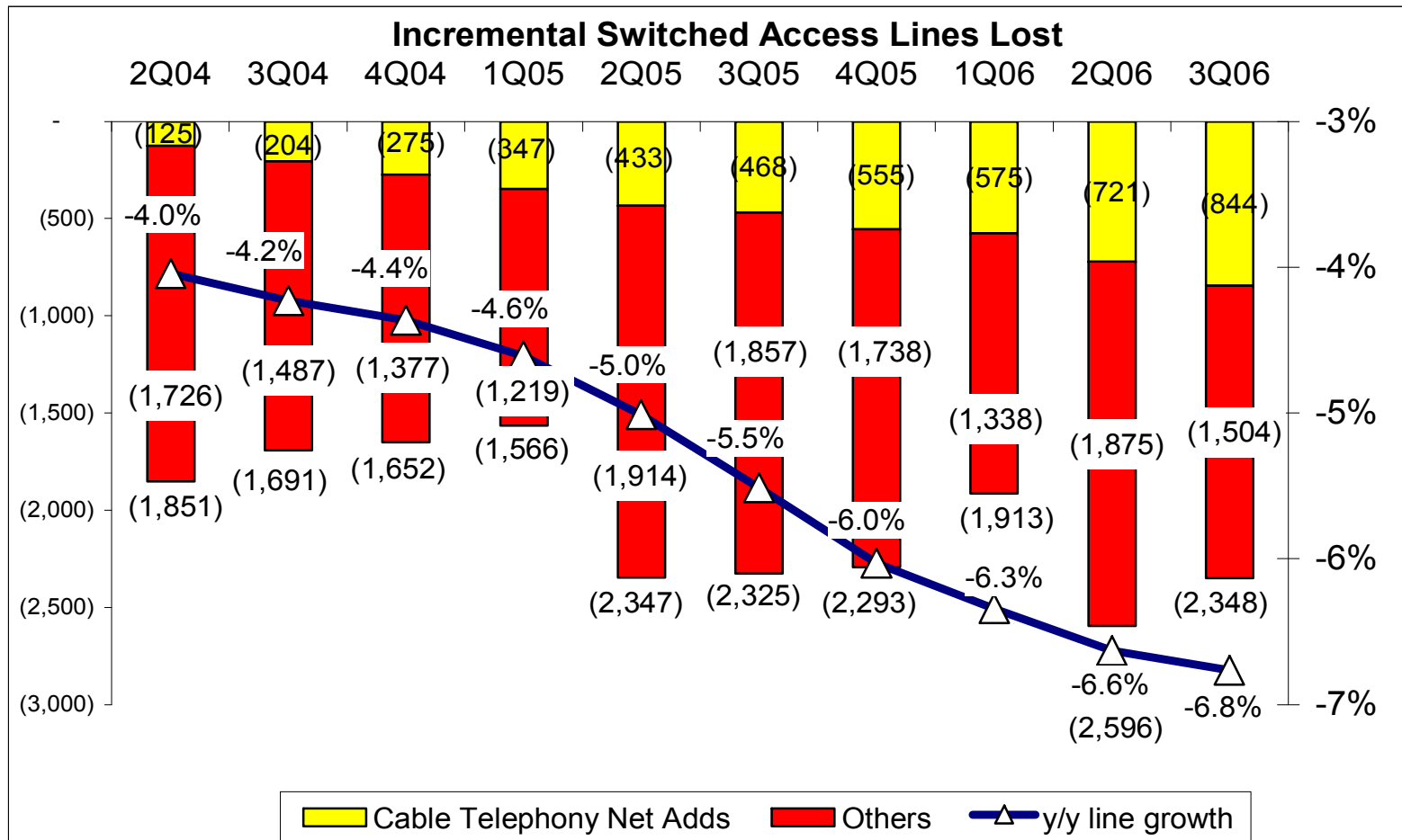
# Capacity Shortage Looming

“The unrelenting growth in Internet traffic in 2007 may overwhelm the Internet's backbone; the terabit-cable pipes connecting continents will reach capacity and ISPs will not be prepared to pay for extra bandwidth because consumers will be unwilling to pay increased costs.

The growth in demand for video delivered over the Internet in particular... as well as IPTV, will be a major contributor to excess capacity being absorbed.”

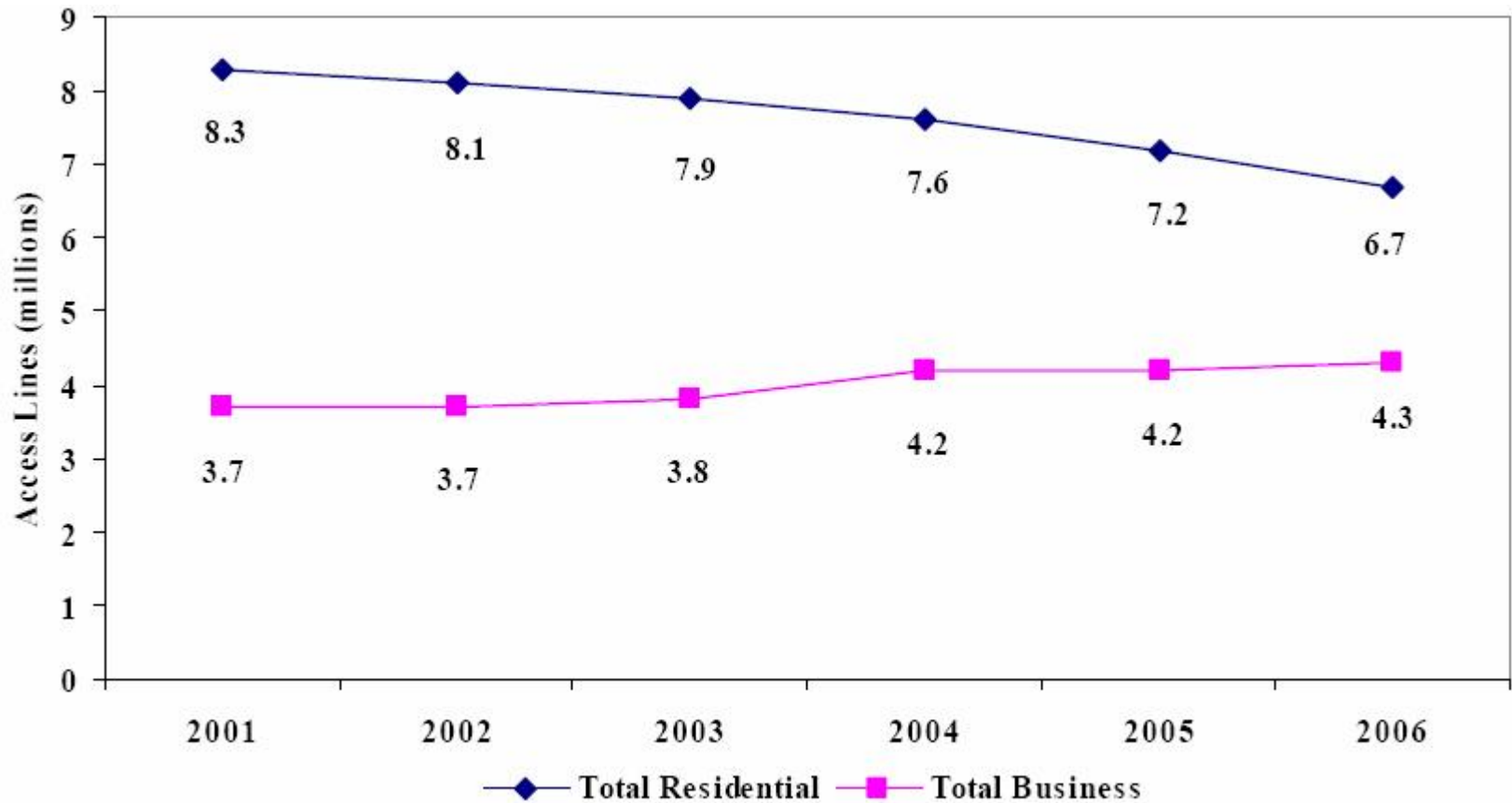
# Fundamental Wireline Trends

# ILECs Losing POTS Lines, Cable Impact Still Small



Note. Data shown for VZ, T, BLS, and Q.

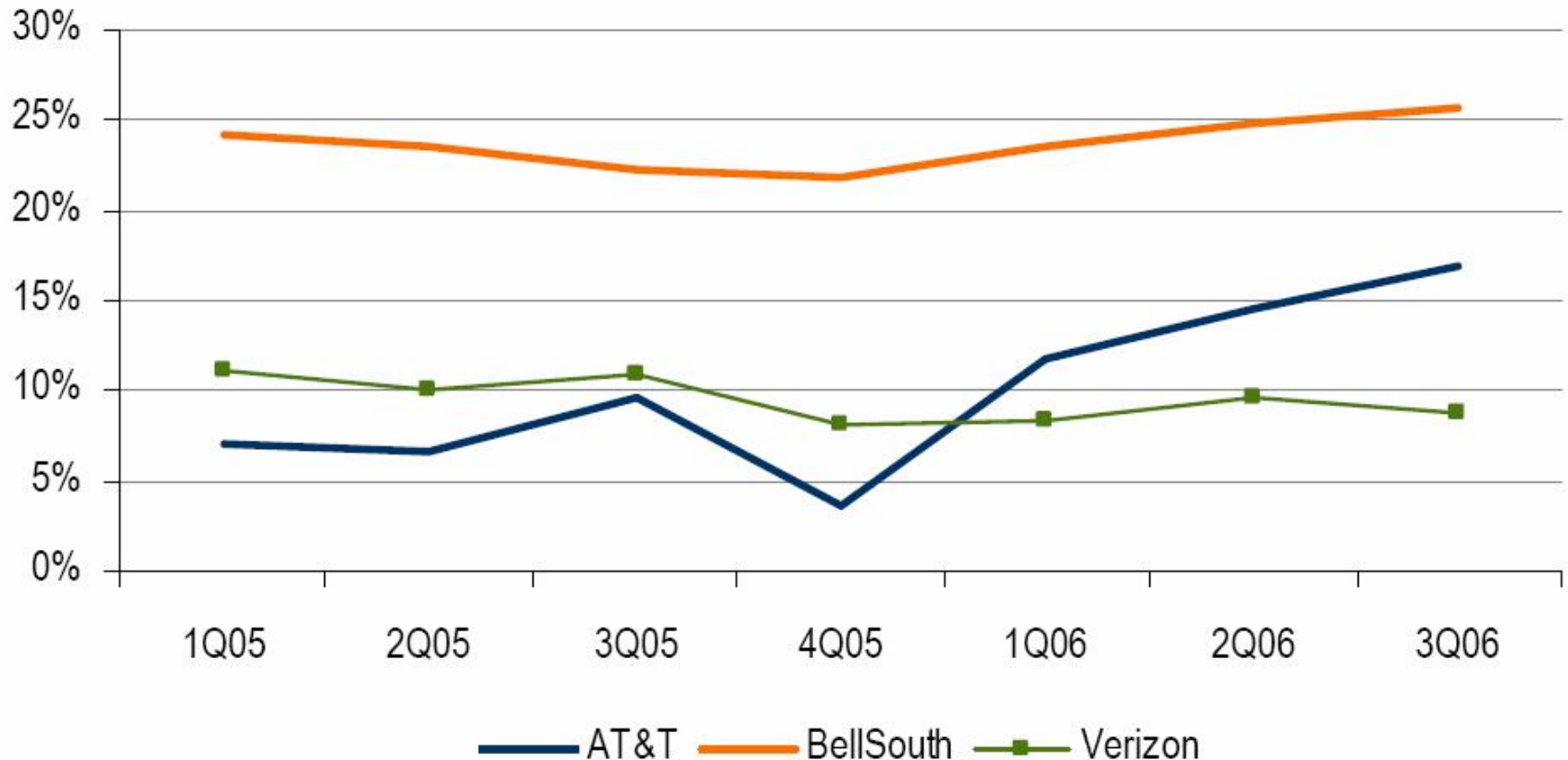
# Florida Access Line Trends



*Source: Responses to 2001-2006 FPSC data requests.*

Source: Florida PSC, "Report on the Status of Competition in Telecommunications Industry, as of May 31, 2006"  
<http://www.psc.state.fl.us/publications/pdf/telecomm/2006CompReportfinal.pdf>

# Cost Cutting vs. Capital Investment Affecting Operating Margins

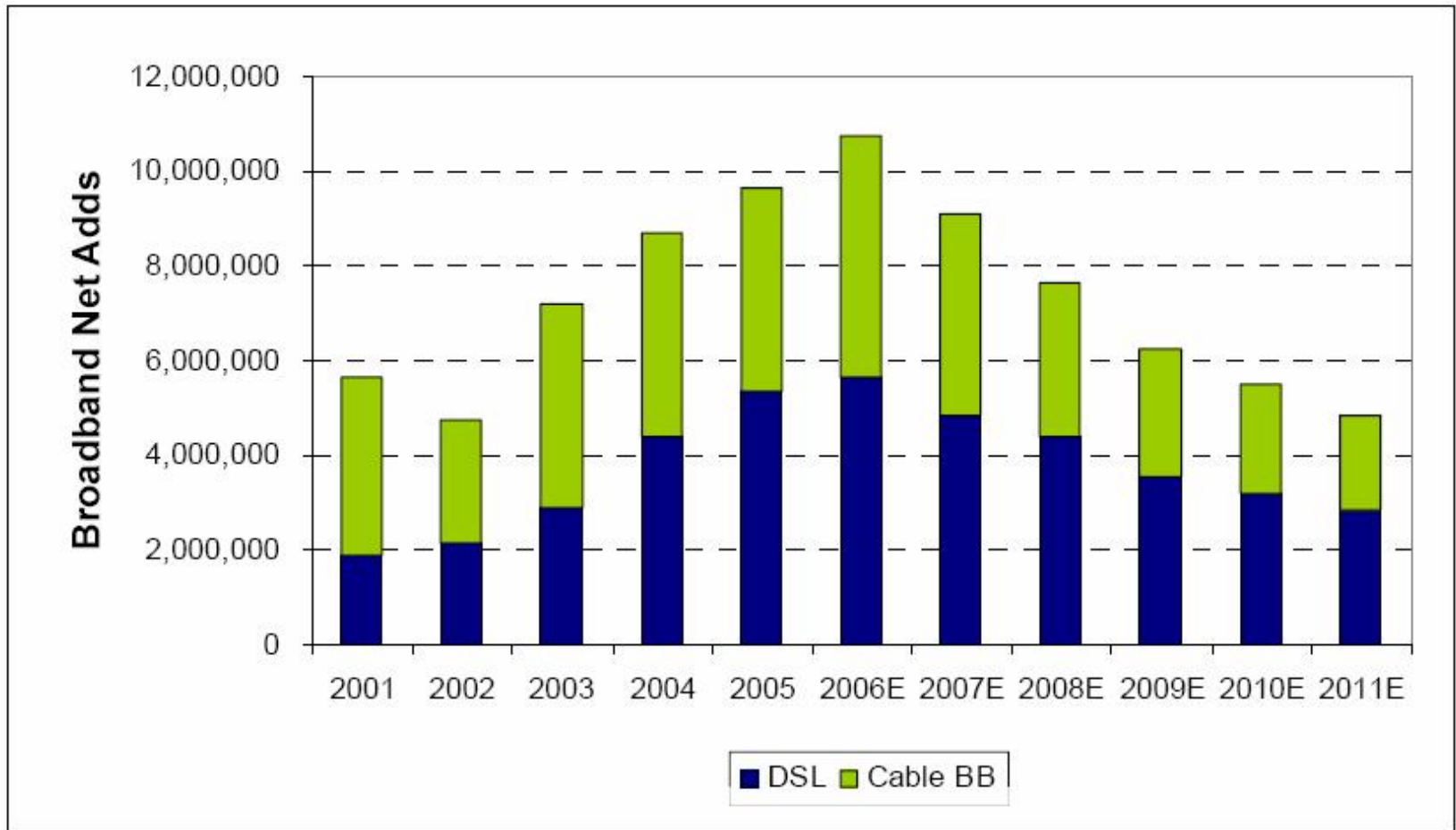


Source: Merrill Lynch "US Wireline Matrix 3Q06", Nov. 2006



# Broadband Fundamental Trends

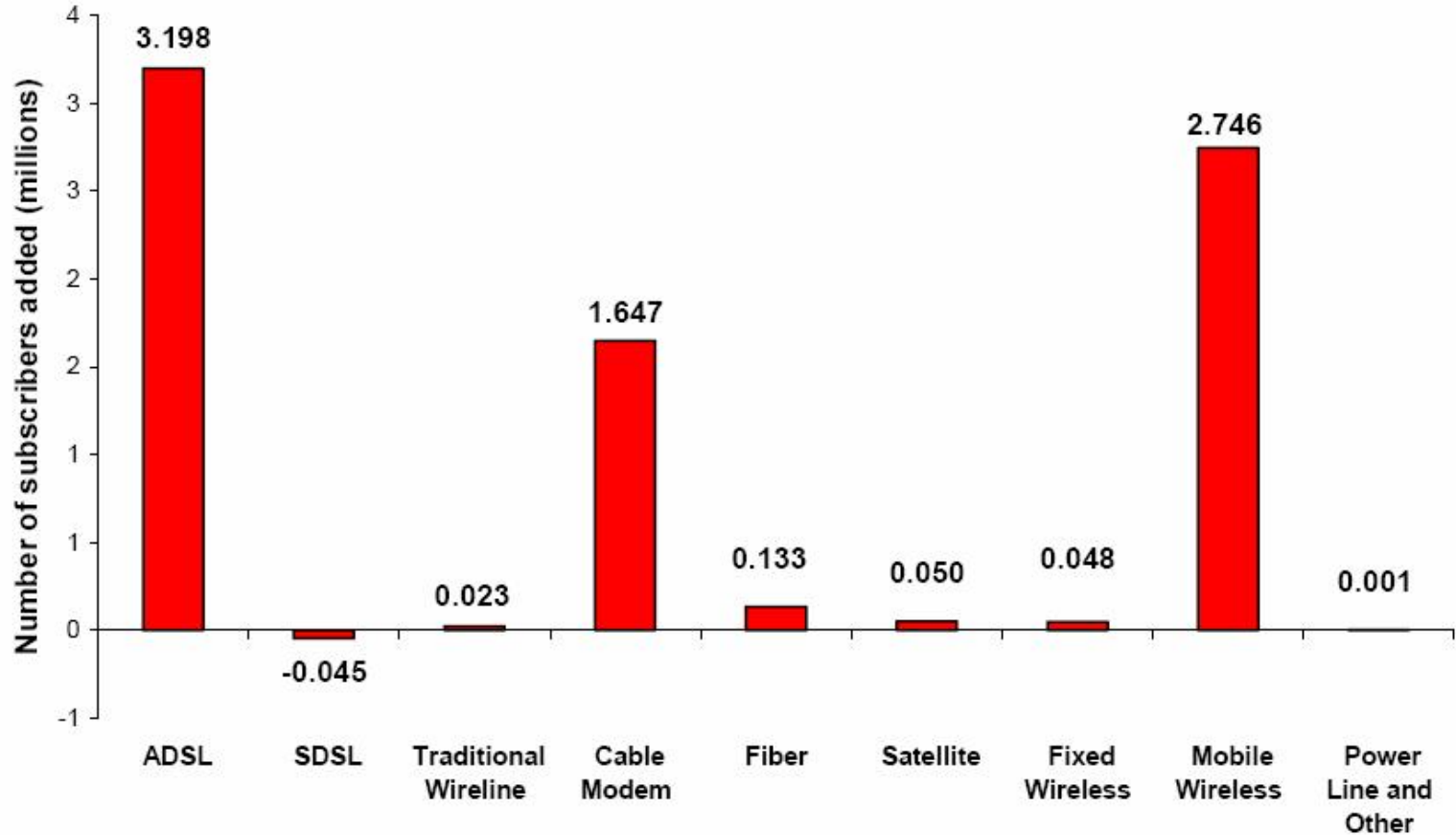
# Is Broadband Maturing?



Source: Morgan Stanley, "Speed Is Key as Broadband Market Matures," Jan. 26, 2007

# Mobile Wireless BB Accelerating...

Net Additions for various technologies (June-Dec 05)

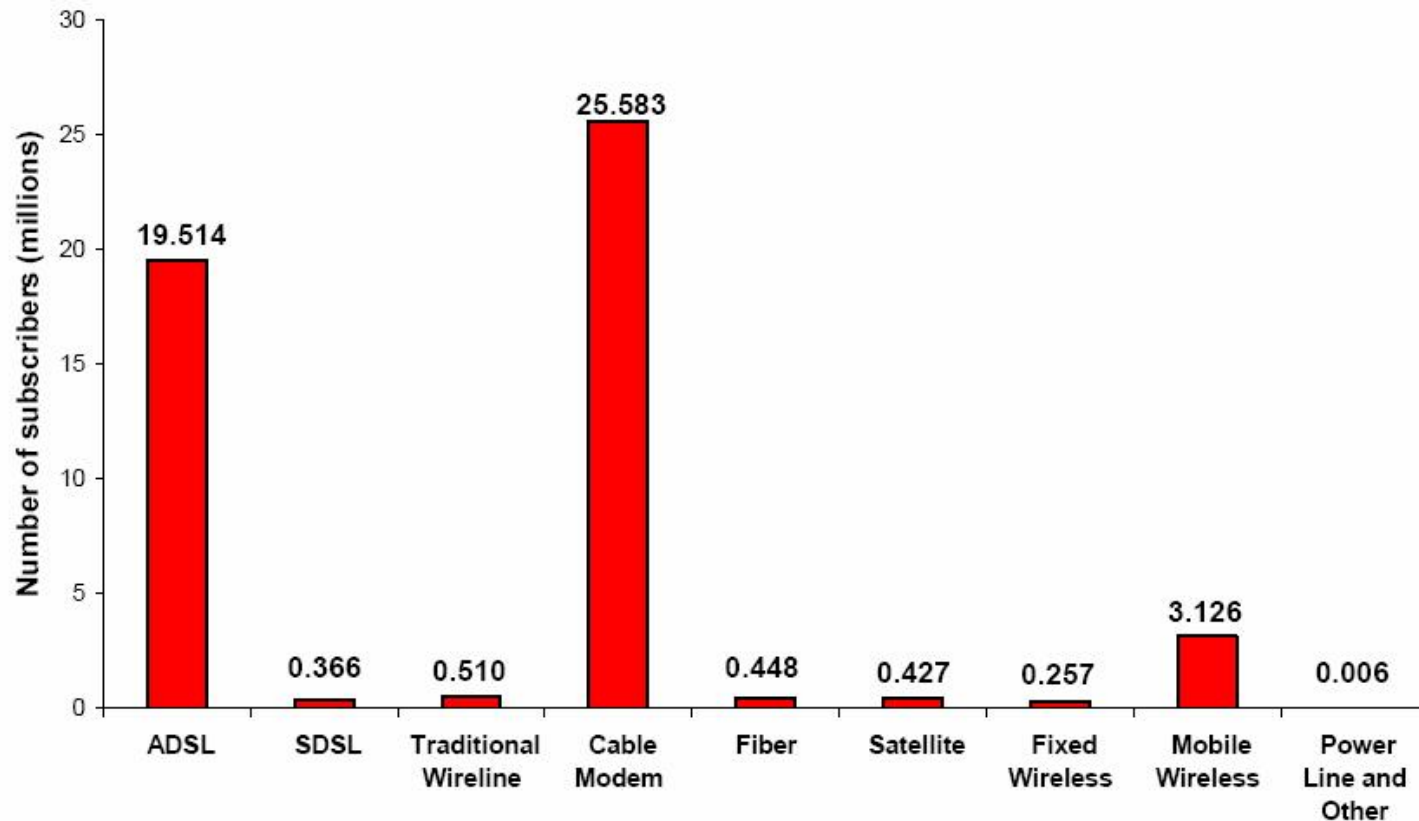


Note: "Mobile Wireless" is mostly Sprint and VZW "3G" service

# ...But Wireless BB Share Still Small

(and is it competitive with or complement to wired BB?)

Number of subscribers for various technologies (Dec 2005)

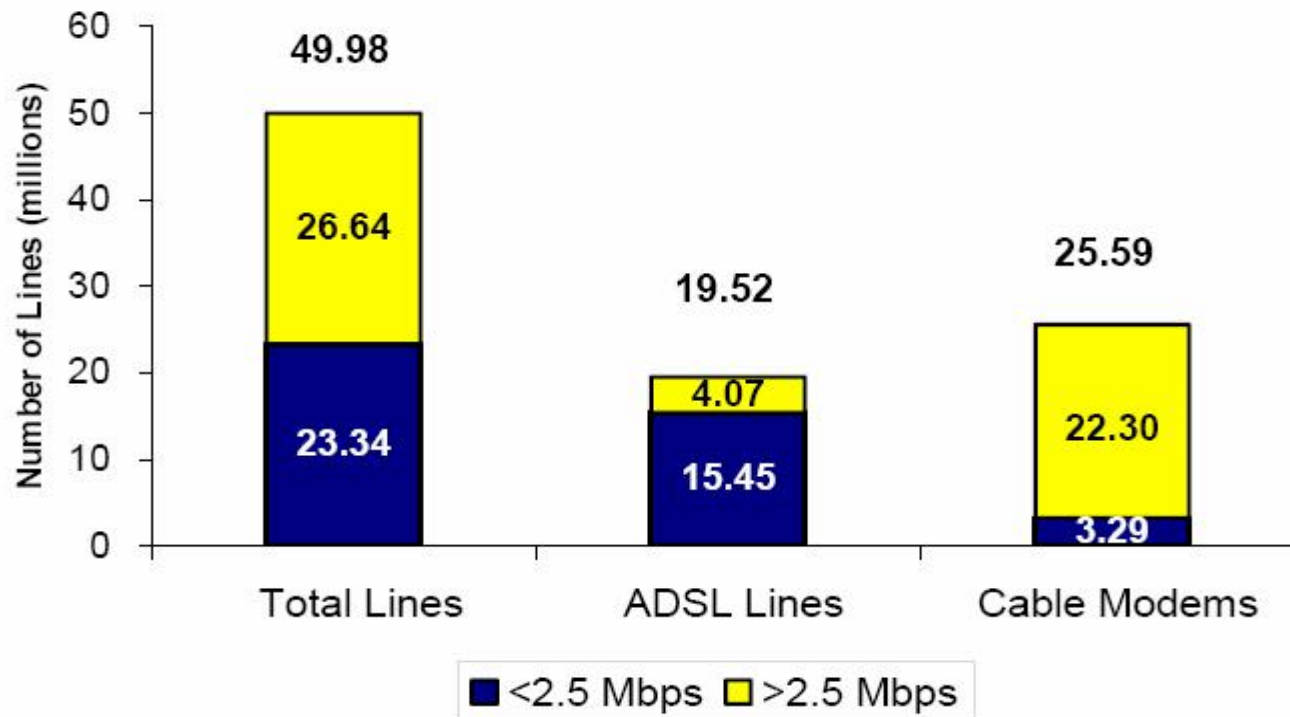


# Speed Wins

*(but Speed Costs)*

“CenturyTel management commented... that 60-70% of customers pick their telecommunications provider based on broadband speeds offered.”

**Number of Broadband Lines by Access Speeds (2005)**



# BB Penetration in Largest States

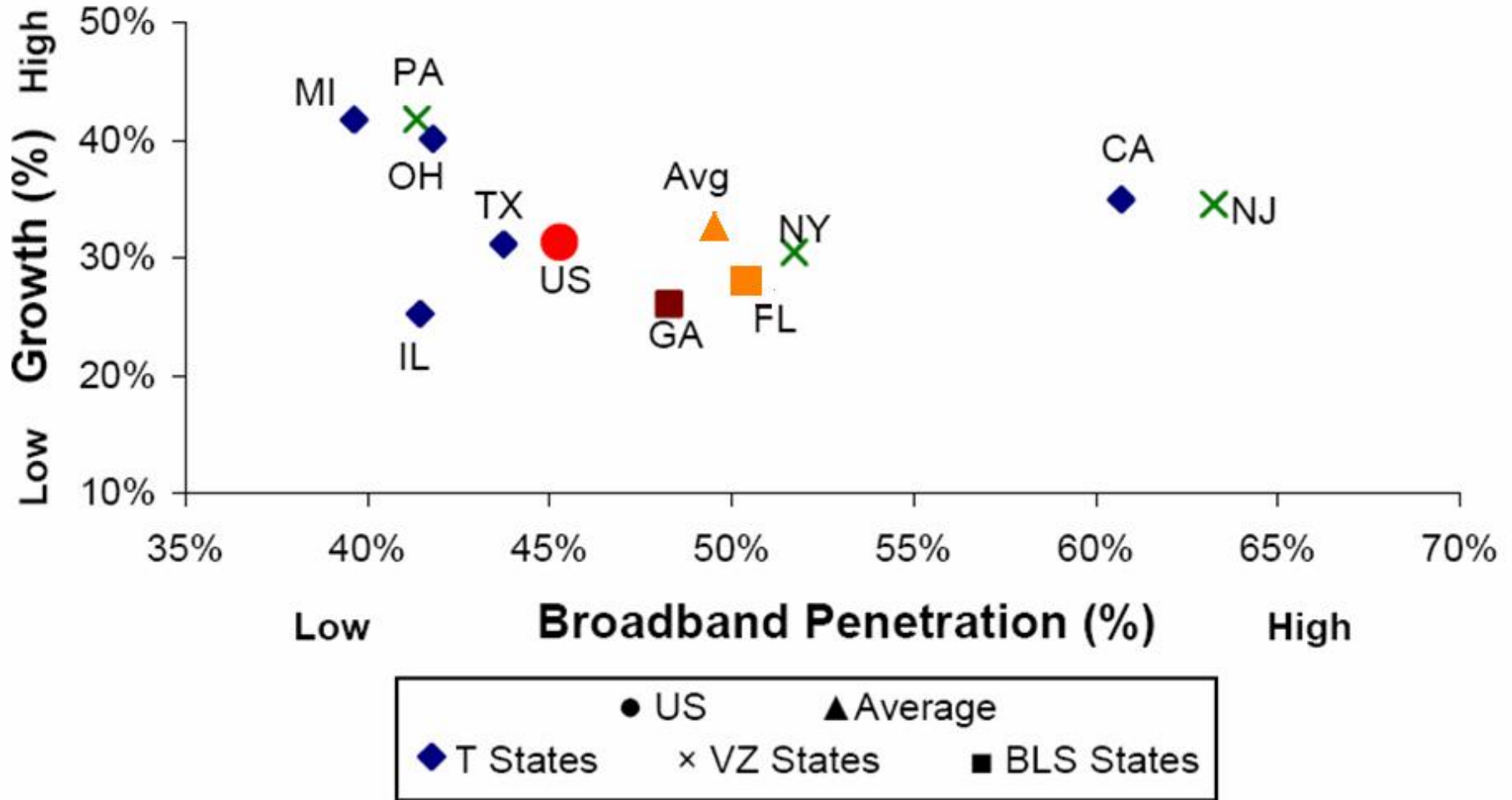
(Florida is fourth)

State	RBOC	Population	Broadband penetration	ADSL penetration	Cable penetration	ADSL Growth	Cable Growth
California	AT&T	36,132,147	60.7%	29.8%	22.6%	32.0%	22.0%
Texas	AT&T	22,859,968	43.7%	19.1%	20.4%	34.7%	20.4%
New York	Verizon	19,254,630	51.7%	12.2%	34.5%	34.5%	23.8%
Florida	BellSouth	17,789,864	50.4%	21.6%	24.9%	32.8%	22.5%
Illinois	AT&T	12,763,371	41.4%	20.9%	15.7%	37.9%	5.6%
Pennsylvania	Verizon	12,429,616	41.4%	14.3%	22.2%	58.1%	21.0%
Ohio	AT&T	11,464,042	41.8%	14.7%	22.6%	45.4%	26.9%
Michigan	AT&T	10,120,860	39.6%	11.8%	24.3%	54.3%	29.8%
Georgia	BellSouth	9,072,576	48.3%	27.3%	16.8%	37.7%	15.3%
New Jersey	Verizon	8,717,925	63.2%	17.2%	38.3%	44.3%	18.2%
<b>Sum</b>		<b>160,604,999</b>					
<b>United States</b>		<b>296,410,404</b>					
<b>Percentage of Population</b>		<b>54.2%</b>					

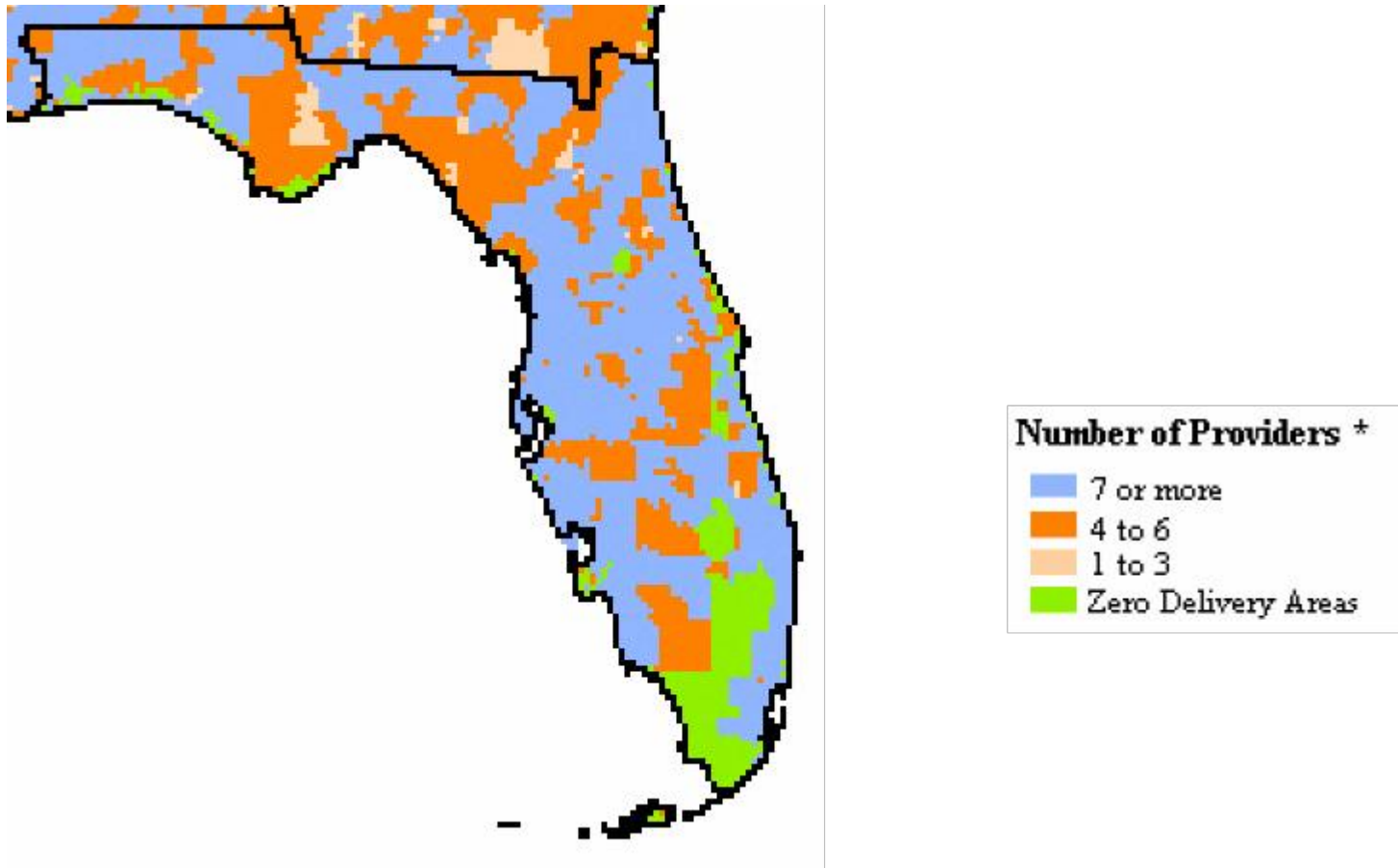
Source: Morgan Stanley, "Speed Is Key as Broadband Market Matures," Jan. 26, 2007. Based on FCC Data

# BB Penetration vs. Growth

(in 10 highest population states – 2005)



# BB Providers In Florida By Zipcode

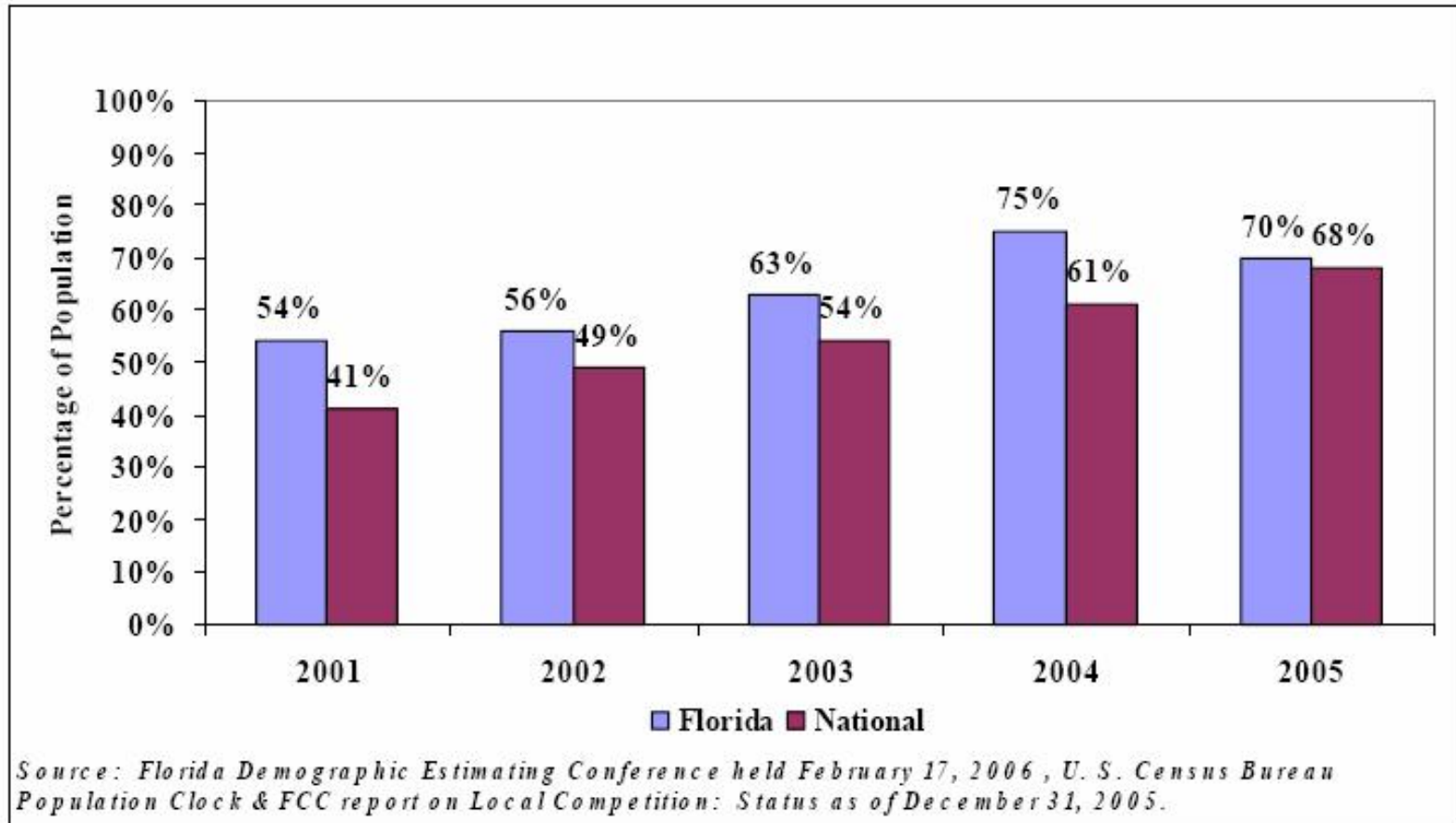


Source: FCC, "High Speed Services for Internet Access: Status as of June 2006,"  
[http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-270128A1.doc](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-270128A1.doc)



# Wireless Fundamental Trends

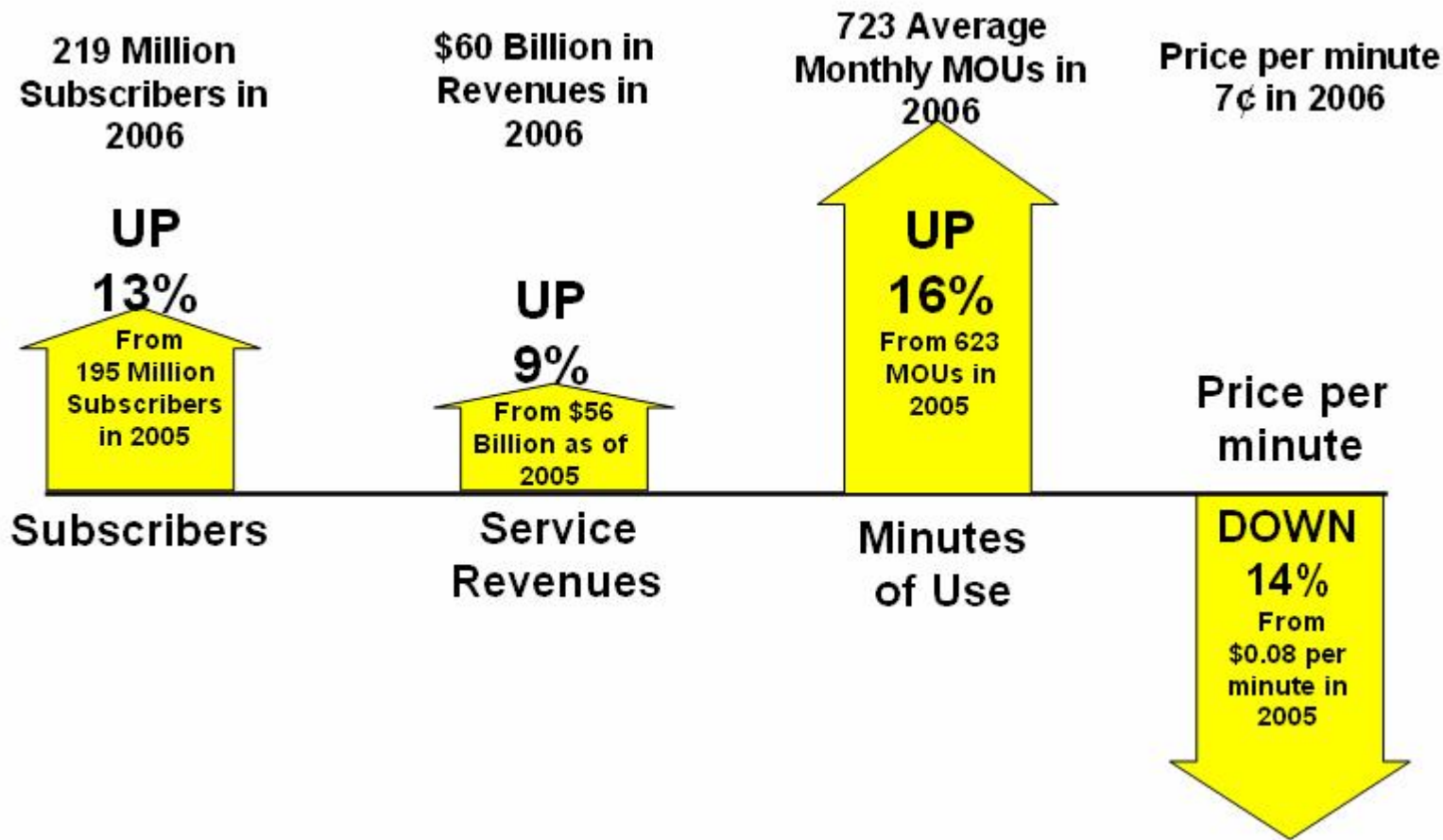
# Wireless Penetration: Florida / US



Source: Florida PSC, "Report on the Status of Competition in Telecommunications Industry, as of May 31, 2006  
<http://www.psc.state.fl.us/publications/pdf/telecomm/2006CompReportfinal.pdf>

# FCC's View of Wireless Telephone

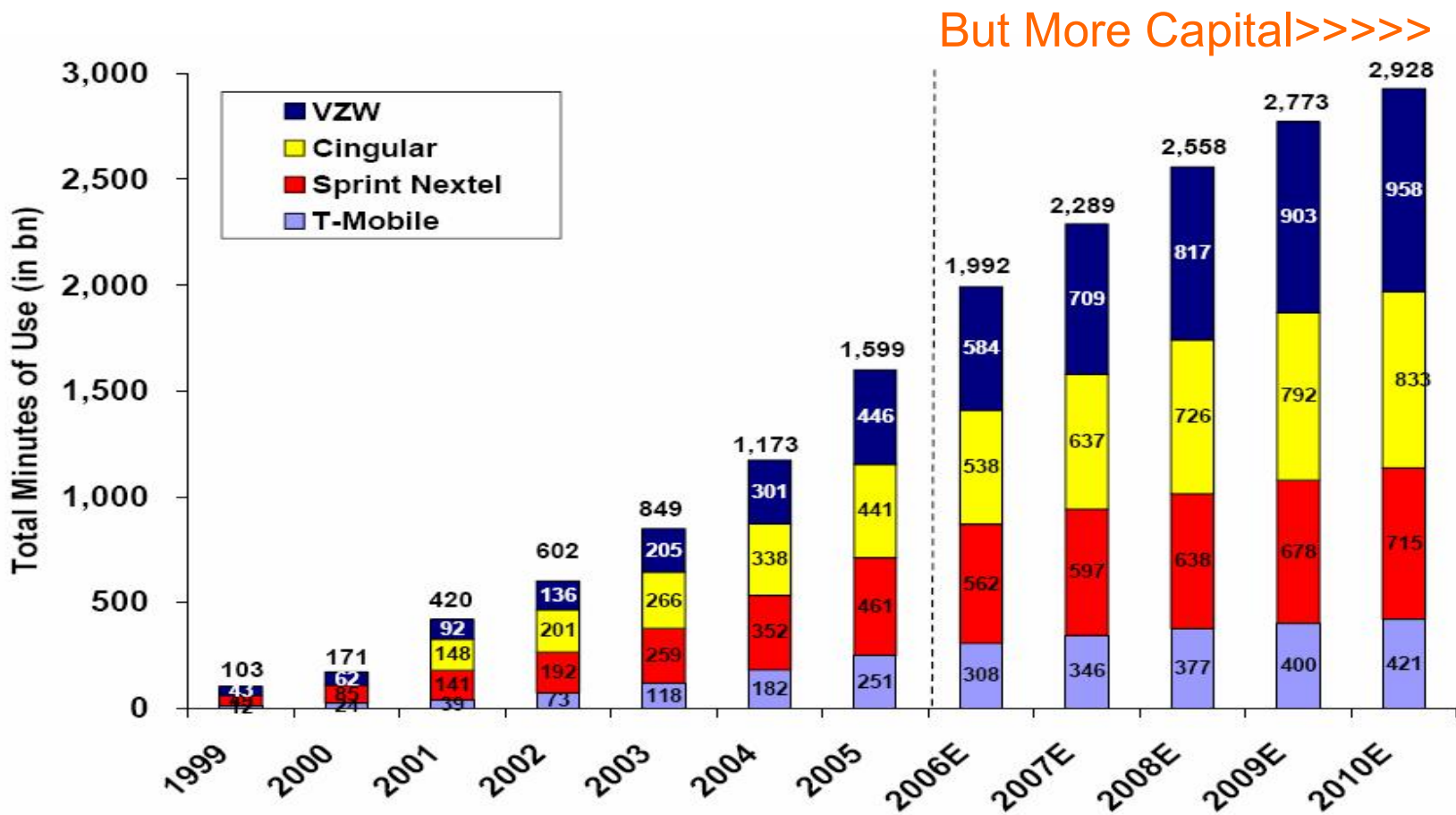
(June 2005-June 2006)



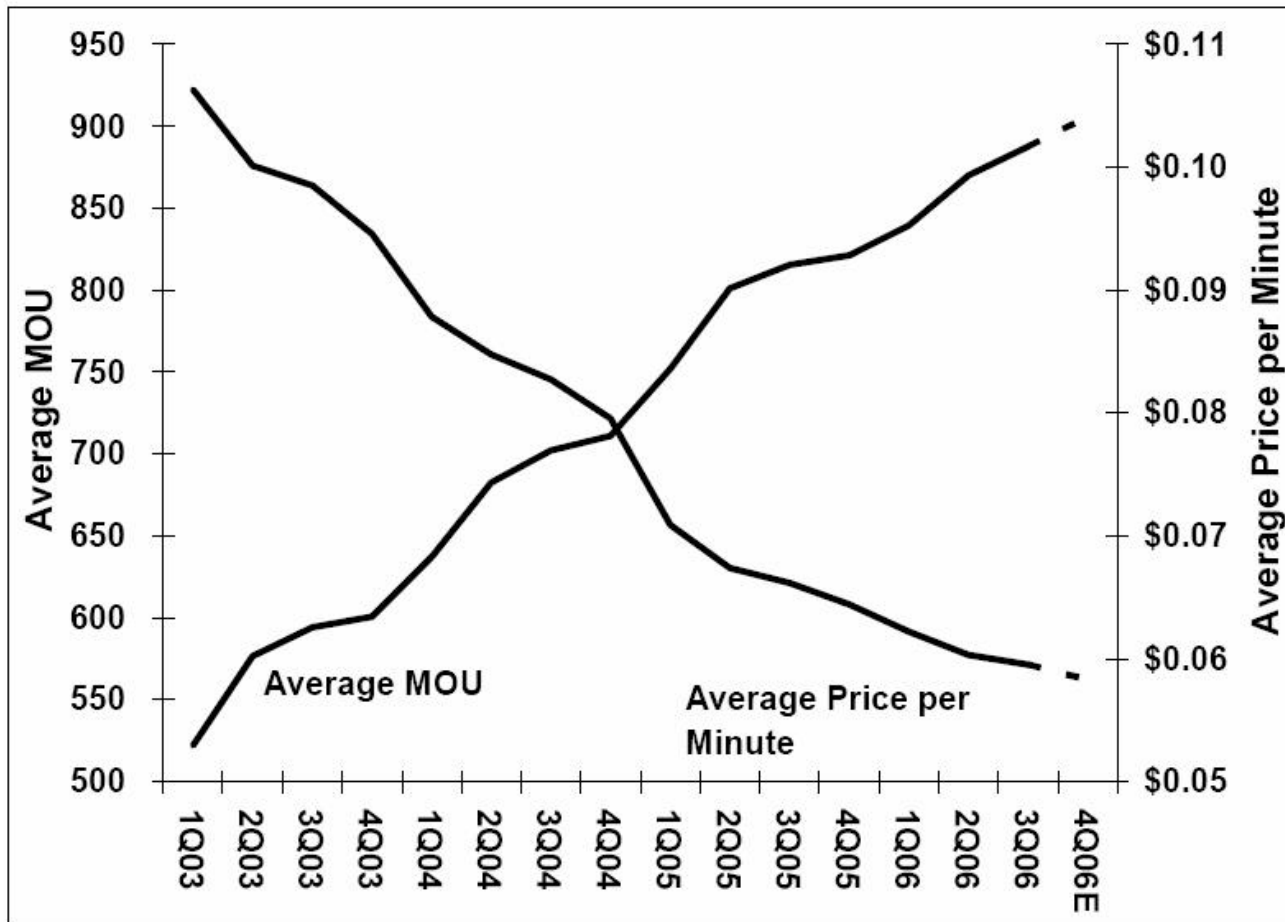
Source: FCC Wireless Telecommunications Bureau, "2006 Annual Report," Jan. 17, 2007

# Strong Wireless Volume Growth

*(Nearly 20X:1999-2006)*

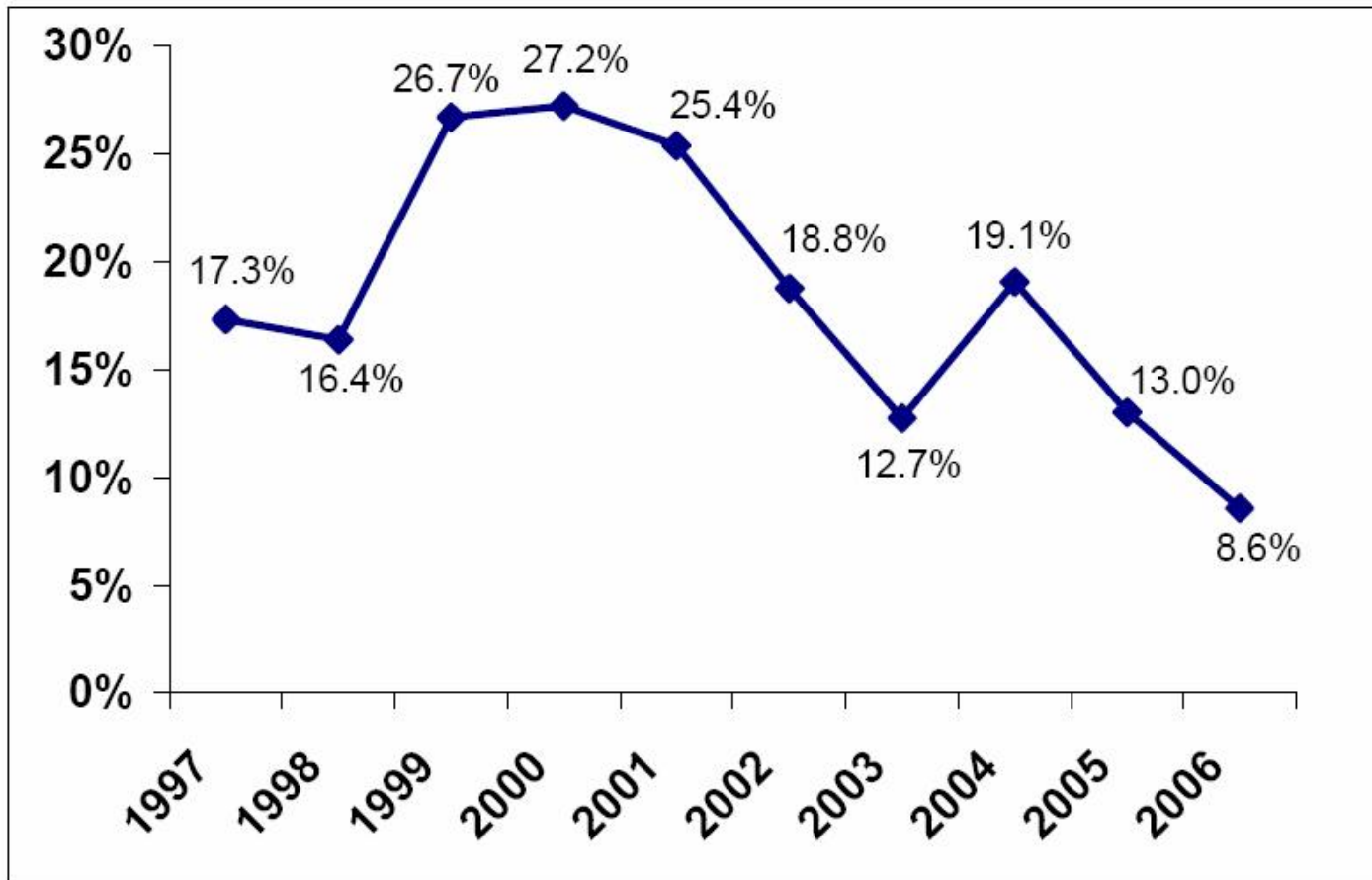


# Wireless Volume Per User Growing But Yields Declining



# Result: Declining Revenue Growth

(First Six Months Each Year)



Source: CTIA

Source: Morgan Stanley, "4Q06 Preview/2007 Outlook: Is Telecom Back for Good?," Jan. 24, 2007

# Emerging Wireless Duopoly?

“Verizon and Cingular [now AT&T] could account for close to 80% of net adds for the national providers, as their growing scale advantages and bundling ability create a virtuous cycle of new customers.”

# CLEC Fundamental Trends

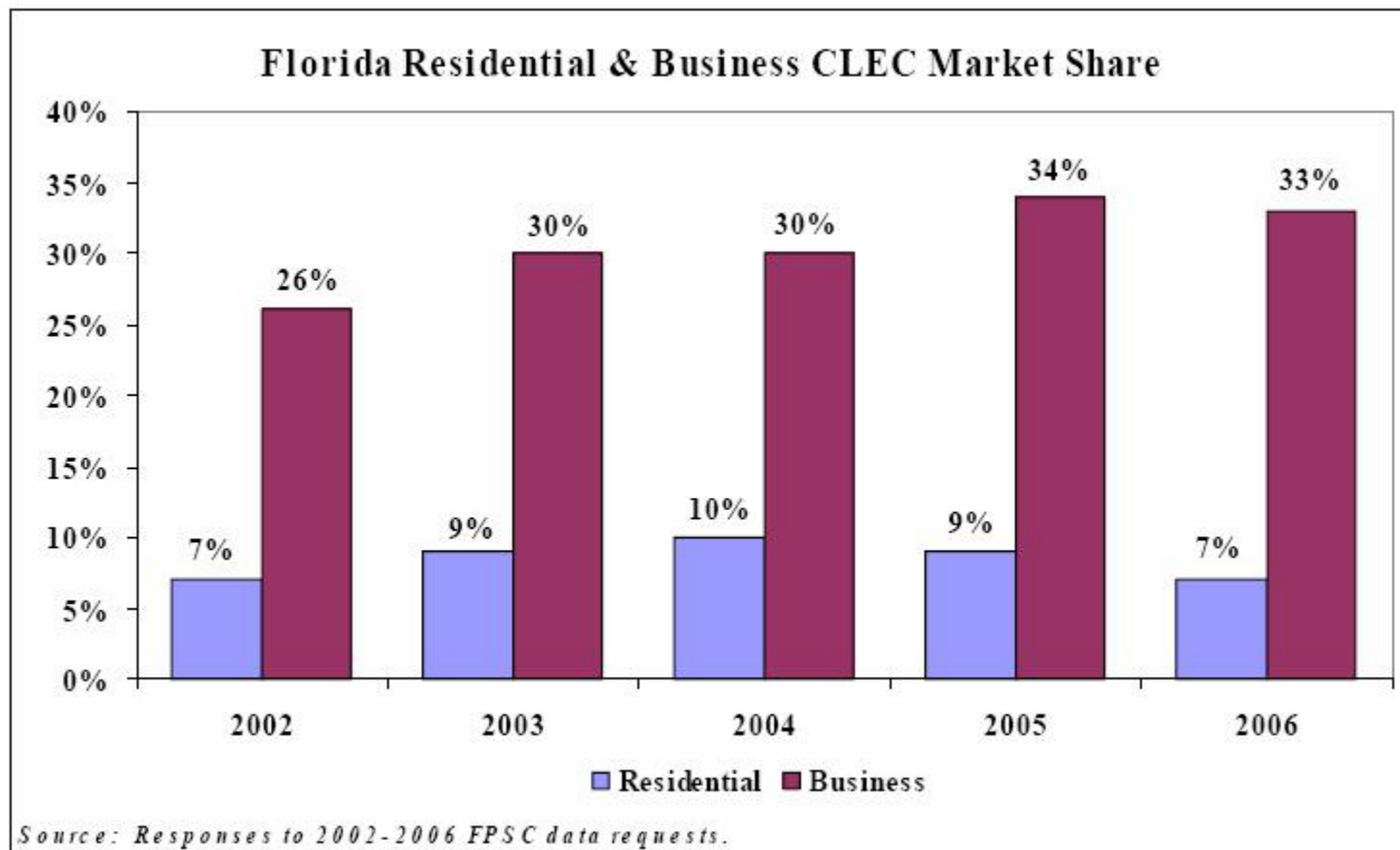


# CLEC Recovery

“The CLEC industry itself has emerged from a severe downturn in the early 2000s as high leverage and large capital requirements drove several players into bankruptcy. CLECs...have been successful in the small business market through tailored services and a focused sales force. They are also benefiting from an improved competitive environment as AT&T and Verizon integrate their acquisitions and focus on medium-sized and large enterprise accounts.”

Source: UBS Investment Research, Jan. 18, 2007

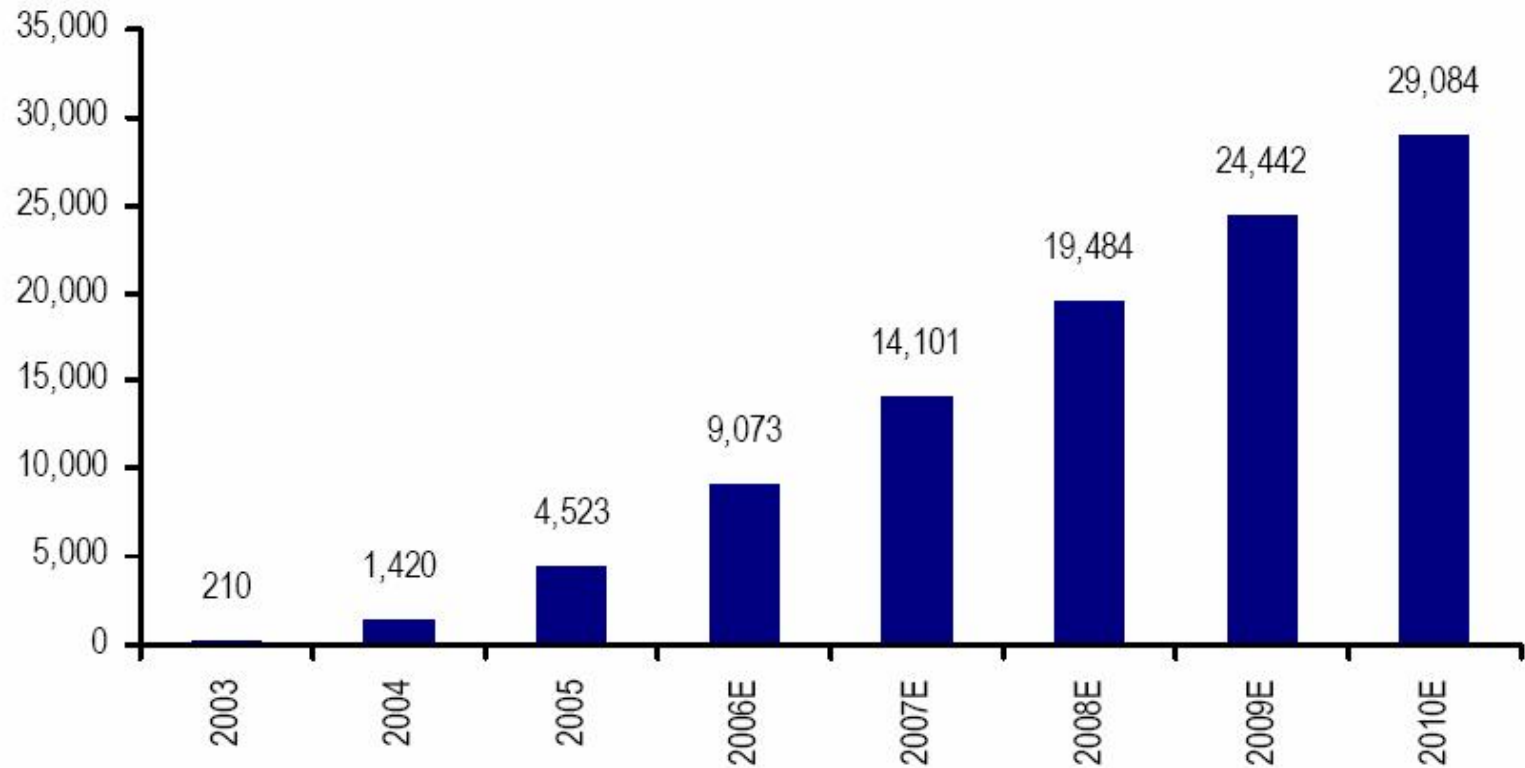
# Strong CLEC Presence in Florida



Source: Florida PSC, "Report on the Status of Competition in Telecommunications Industry, as of May 31, 2006"  
<http://www.psc.state.fl.us/publications/pdf/telecomm/2006CompReportfinal.pdf>

# The IP Future

# VoIP Subscriber Forecasts



Note: Includes estimates for top seven cable MSOs and leading independent VoIP providers (Vonage, Primus, Packet 8, and Covad).

# IP Backbone Price Declines

Future [backbone] revenue growth will be a function of growth in demand, offset by continuing pricing declines.... We believe industry pricing averages roughly \$40-50/Mbps. Although pricing pressure has moderated somewhat from 55-60% annual declines during 2001-04, **average industry pricing is expected to continue to decline about 25% annually for the foreseeable future.**

# But IP Capacity Shortage Looming

The unrelenting growth in Internet traffic in 2007 may overwhelm the Internet's backbone; the terabit-cable pipes connecting continents will reach capacity and ISPs will not be prepared to pay for extra bandwidth because consumers will be unwilling to pay increased costs.

... these issues loom on the horizon because the **investment in core infrastructure is not keeping pace with the usage and demand**, said Openshaw.\* The growth in demand for video delivered over the Internet in particular... as well as IPTV, will be a major contributor to excess capacity being absorbed.

...it's not in the too distant future, the excess capacity is gone," said Openshaw. "***So somebody's got to step up and decide who is going to make the investments and who is going to pay for them.***"

**\*NOTE: Eric Openshaw is principal and leader of Deloitte's America's Technology, Media and Telecommunications practice**

(Most) Investors Like **Less** Competition

...Do Policymakers?

# Increasing Wireline Prices?

AT&T and others have selectively raised consumer wireline prices of late... We have also seen a decline in the number of discounted DSL plans over the past several months.

We think the changes could be indicative of a number of factors: (1) **more favorable state regulatory environments**, (2) maturity of high speed data offers with regard to DSL and cable modem services, (3) potentially increasing inelasticity of demand to small pricing changes, and (4) **competitive signaling**.



# Reduced Wireless Price Competition

“We do not anticipate that wireless carriers will re-price voice plans, as the carriers would rather compete on handset subsidies. The primary risk to our assumption is that another carrier, such as Sprint, gets more aggressive with its voice prices in order to rejuvenate growth, causing competitors to potentially modify pricing plans.”

# Typical Consumer Cost Up 3%

The typical bundle of local phone, long distance and DSL service, for instance, cost about 3% more in the last three months of 2006 than it did in the same period a year earlier, Banc of America Securities reported last week.

It was the first year-over-year increase the investment bank's researchers had seen in phone and Internet pricing since they began tracking it in 2003.

Entry-level prices for stand-alone digital subscriber line service, known as DSL — the phone companies' high-speed Internet service — rose as much as 34%. And both AT&T and Verizon have bumped up pay-TV prices, even though they have made few inroads in that market.

# Enterprise Price Stability

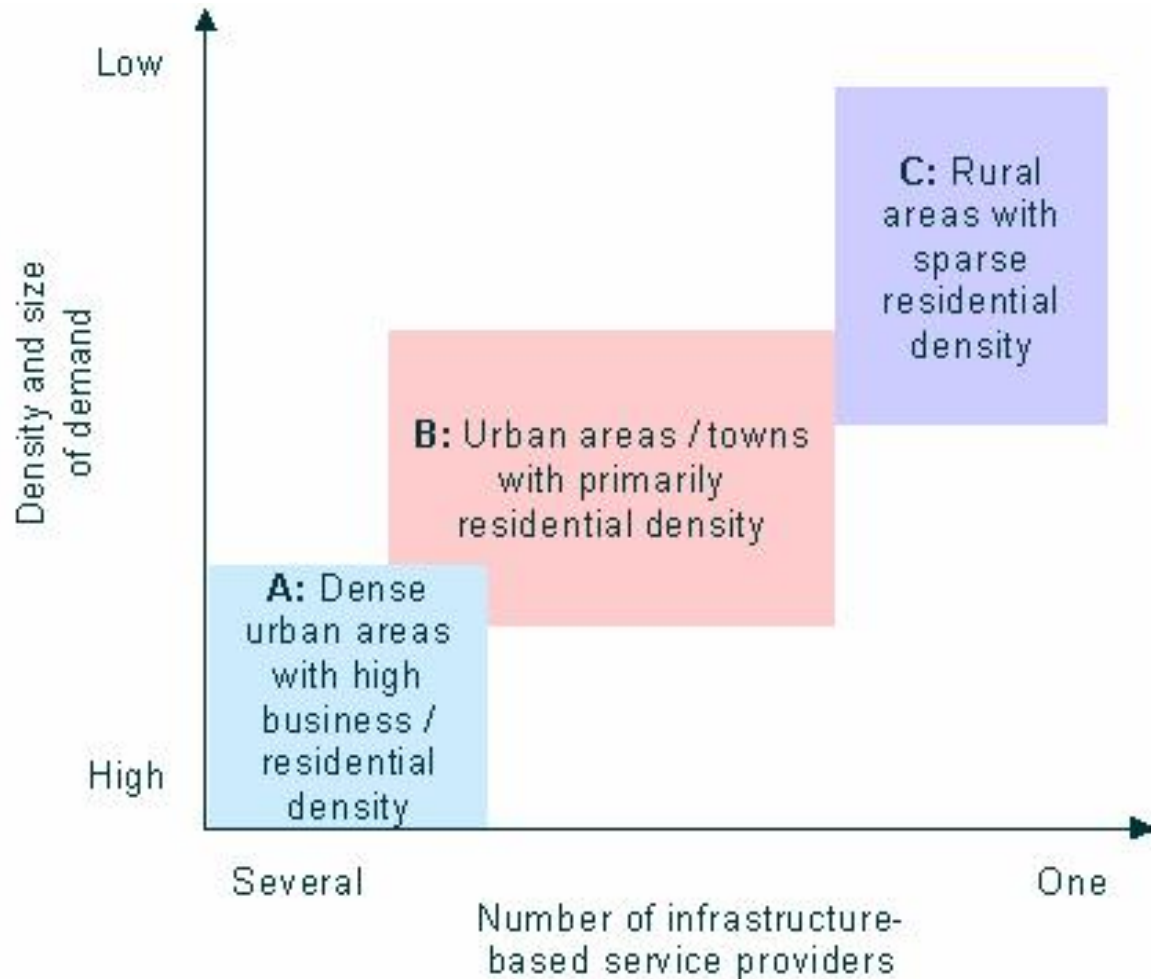
“Enterprise pricing has been stabilizing over recent quarters and demand appears solid. In aggregate... revenues have been stable on a sequential basis for the past two quarters. Supply in the market has been consolidated in the past couple of years by AT&T, Verizon, Level 3 and others.”

The Big Question  
for Investors (and Regulators):  
*Are Multiple Local Broadband  
Infrastructures Sustainable?*

# Are Multiple Local Broadband Infrastructures Sustainable?

- THE key question for regulators, investors, application/content providers and telecom management
  - Will return justify huge capital risk?
    - Fewer infrastructures/less competition=lower risk
  - Where will the return come from?
    - Basic services or value-added/content?
  - Who captures the value?
    - Infrastructure operators or content providers? (aka “Net Neutrality”)
- Is “entertainment over BB” (cable vs. IPTV/FiOS) the critical competitive determinant?

# Where Can Multiple Broadband Infrastructures Be Sustained?



# Natural Oligopoly?

- Conclusion from the recent worldwide experience: equilibrium for telecom networks is not infrastructure competition but infrastructure oligopoly
- Survivors must cover fixed costs
- To be clear: **this is not a CITI preference or policy recommendation**, but a forecast based on business fundamentals

# Most Likely Market Structure to Emerge in Most Areas

- 2.5 wireline telecom carriers: two RBOCs and regional/local carriers
- 2.5 national wireless carriers: one CDMA, one GSM and one independent of RBOCs
- One national coalition of cable companies for telecom services
- Several wholesale IXC and specialized business carriers are also likely



# Emerging Duopoly?

“...‘It's too early to draw a conclusion, but it appears that competition is not leading us to a race to the bottom,’ said Banc of America analyst David W. Barden.

Instead, he said, a duopoly is emerging where cable and phone companies can avoid provoking price cuts in their core services. Carriers, for instance, can discount DSL service while keeping prices up on phone service, and cable firms can drop prices for phone service but maintain higher pay-TV rates.

That's good news for the carriers and their investors, who have wondered whether competition would drive dirt-cheap phone prices down further.”

# Oligopoly Price Signaling?

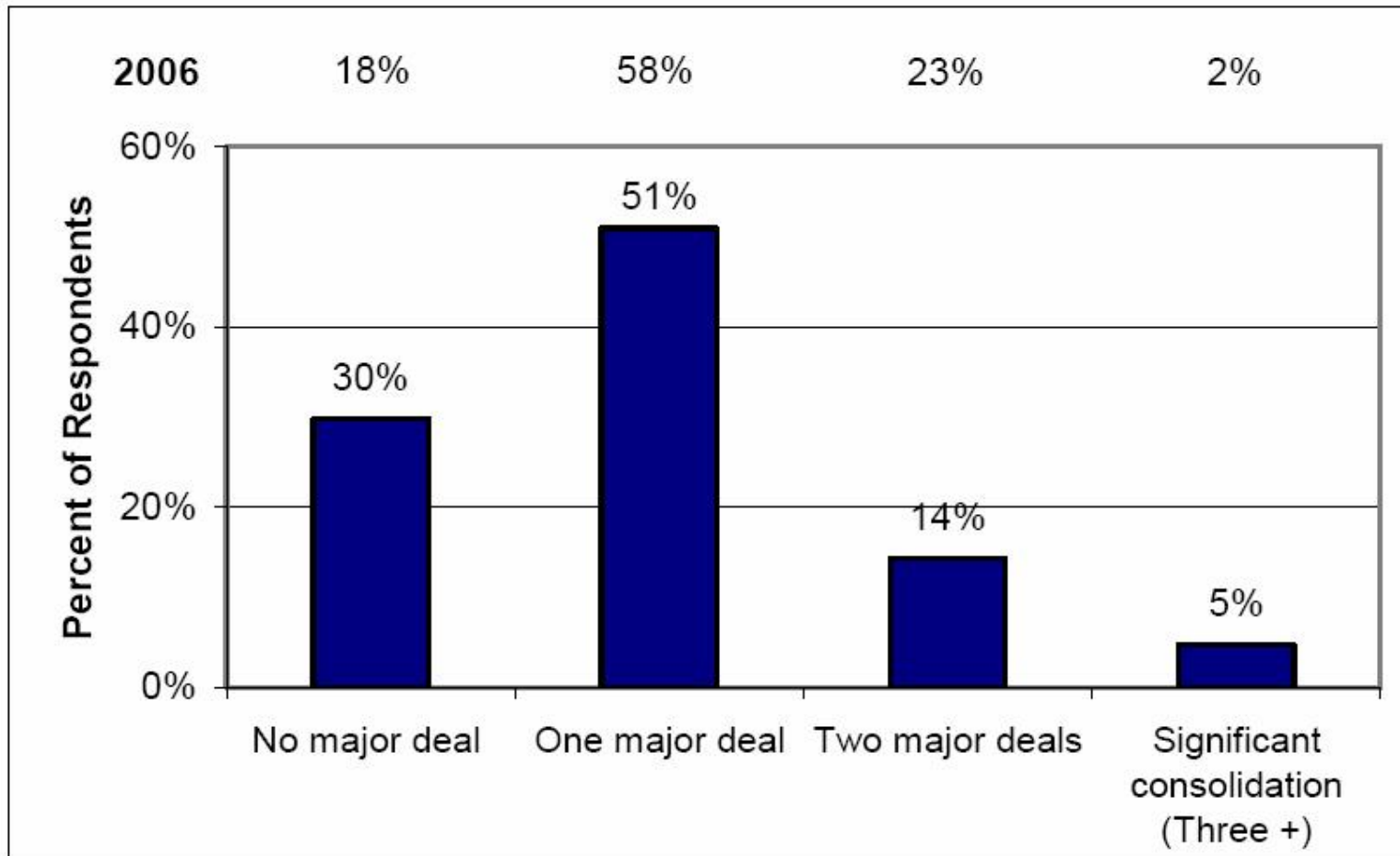
Verizon raised its Fiber Optic Service (FiOS) video pricing from \$39.99 to \$42.99 effective in January, *which we view as a signaling event with regard to cable competition.*

# More Near-term M&A?

“...AT&T solving its video problem [buying DISH to fix IPTV weakness], the DBS players solving their broadband problem [buying WiMax, terrestrial BB to have a “bundle”], the cable industry solving its wireless problem [buying Sprint to bundle], and all multichannel video players buying more content are fairly obvious problems that can be addressed through M&A activities. We think that the parties are likely to want to address those problems in the near term, not the long term.”

# Major Investors Expect More Consolidation in '07

*(Q: Do you expect industry consolidation in 2007?)*



Source: Morgan Stanley, "Telecom Services- Annual Investor Survey: 2007 Outlook," Jan. 11, 2007

# FCC Strategy: Balance Investment Incentives and Competition

“The establishment of policies that reward innovation and investment in facilities and infrastructure shall lead to further deployment of new advanced telecommunications capability. The Commission must strive to *achieve a balance between providing incentives to invest in and develop broadband technologies and applications, and maintaining competitive entry and access requirements.*”

# Conclusion

# A Future of Cyclical Instability

- Historic “bust” will inevitably (but temporarily):
  - raise industry concentration
  - slow innovation
  - reduce capacity expansion
  - raise (or stabilize) prices
  - reduce investment in network upgrades
- Telecom industry will enter a phase of less intra-platform competition: a more oligopolistic market structure...
- Followed by a cycle of IP-induced enthusiasm, expansion, competition,...(collapse?)
  - VoIP is just the tip of the iceberg...IPTV coming

# So, A Challenging (But Interesting) Future for Telecom

- ***Fundamental instability will continue***
  - Intensity will be cyclical...unless history repeats itself and a “New Bell System” broadband infrastructure monopoly emerges in some markets
- ***Coping with fundamental instability is the tactical challenge (“be adept at adapting”)***
  - Managers
  - Employees
  - Regulators
  - Investors