

Coping With Relentless Demand Growth: Upgrade or New Build?

NANOG

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Atlanta

Presenter Profile

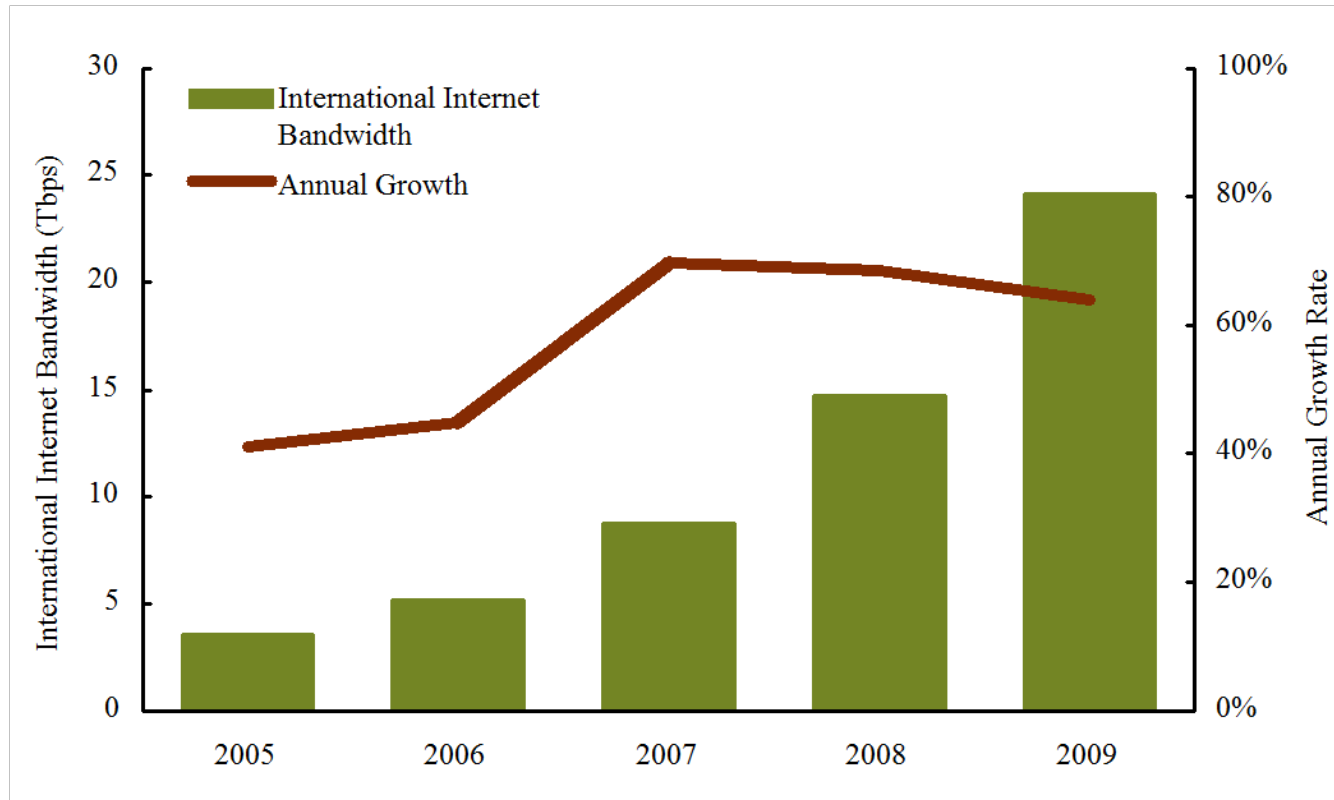
David Ross, President and CEO, The David Ross Group Inc

David G. Ross has served the international communications industry since 1970, beginning at Bell Laboratories with development of the technology for undersea communications systems. Over a 30-year corporate career, he served in a variety of managerial positions with Bell Labs, AT&T and Tyco, culminating in the formation of The David Ross Group Inc. (DRG) in 1999.

Mr. Ross and has overseen the growth of DRG into a premier independent consulting and network development firm. Today DRG provides a broad range of technical, commercial, and managerial services to the international telecommunications industry. The firm's recent activities include over 20 international undersea network developments connecting over 40 countries throughout the world, as well as a broad array of consulting activities from wireless network optimization to telco privatization.

Mr. Ross received the Bachelors and Masters Degrees in Electrical Engineering from the University of Michigan at Ann Arbor. He holds several patents, is a published author, and has been an invited speaker at conferences and seminars worldwide.

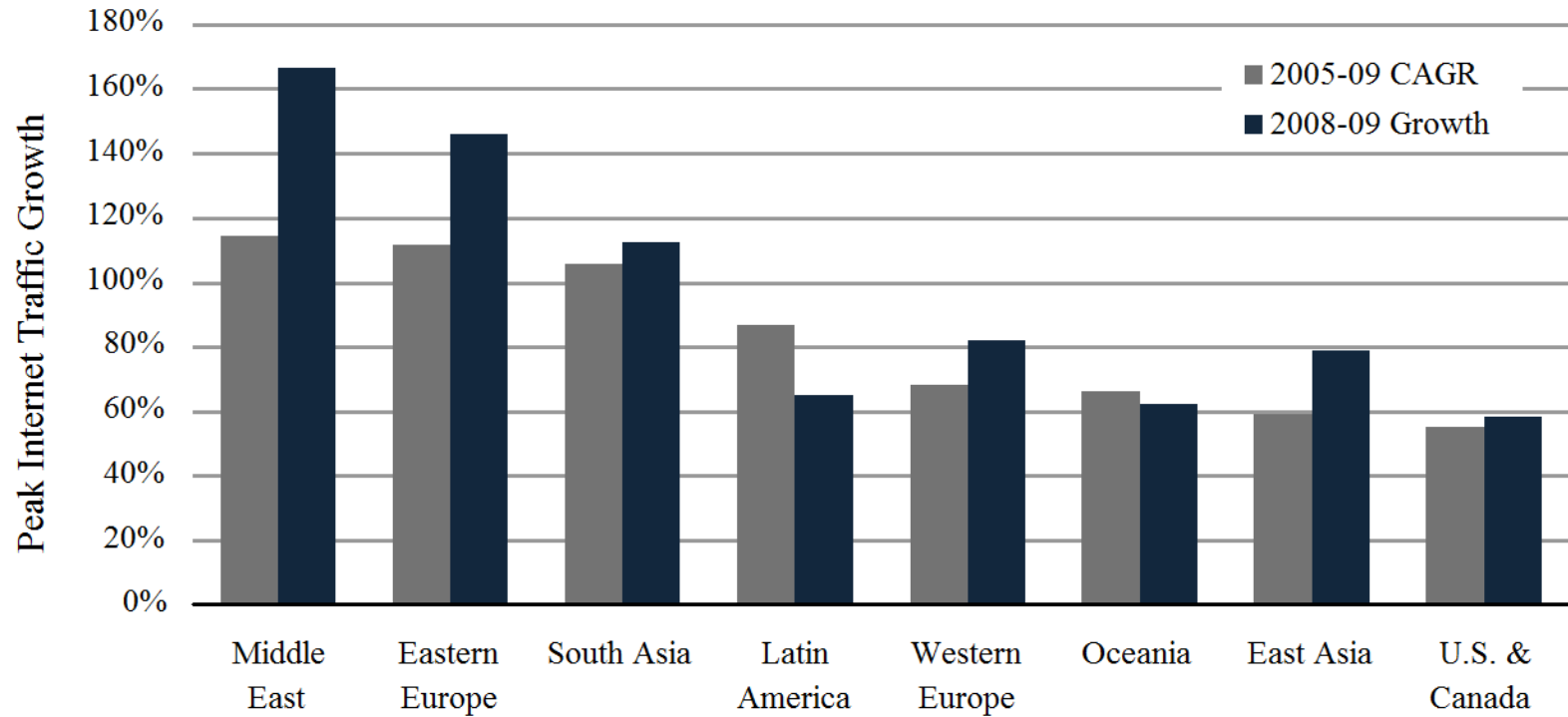
International Internet Bandwidth Growth, 2005-2009



- Annual growth has exceeded 60% the past 3 years
- More capacity was added in 2009 alone (9.4 Tbps) than the total capacity in service in 2007 (8.7 Tbps)

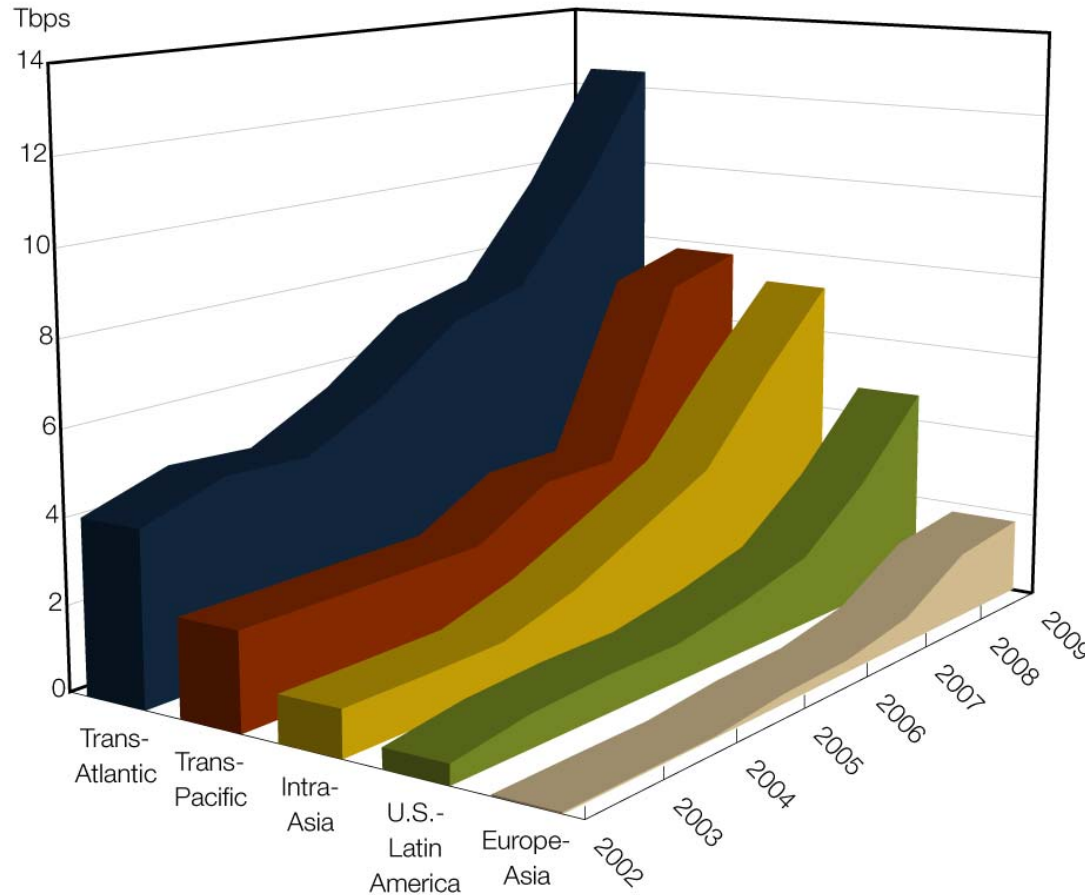
Source: TeleGeography

Growth is Strong in Every Region of the World



Source: TeleGeography

Undersea Network Capacity is Expanding to Meet Worldwide Demand Growth



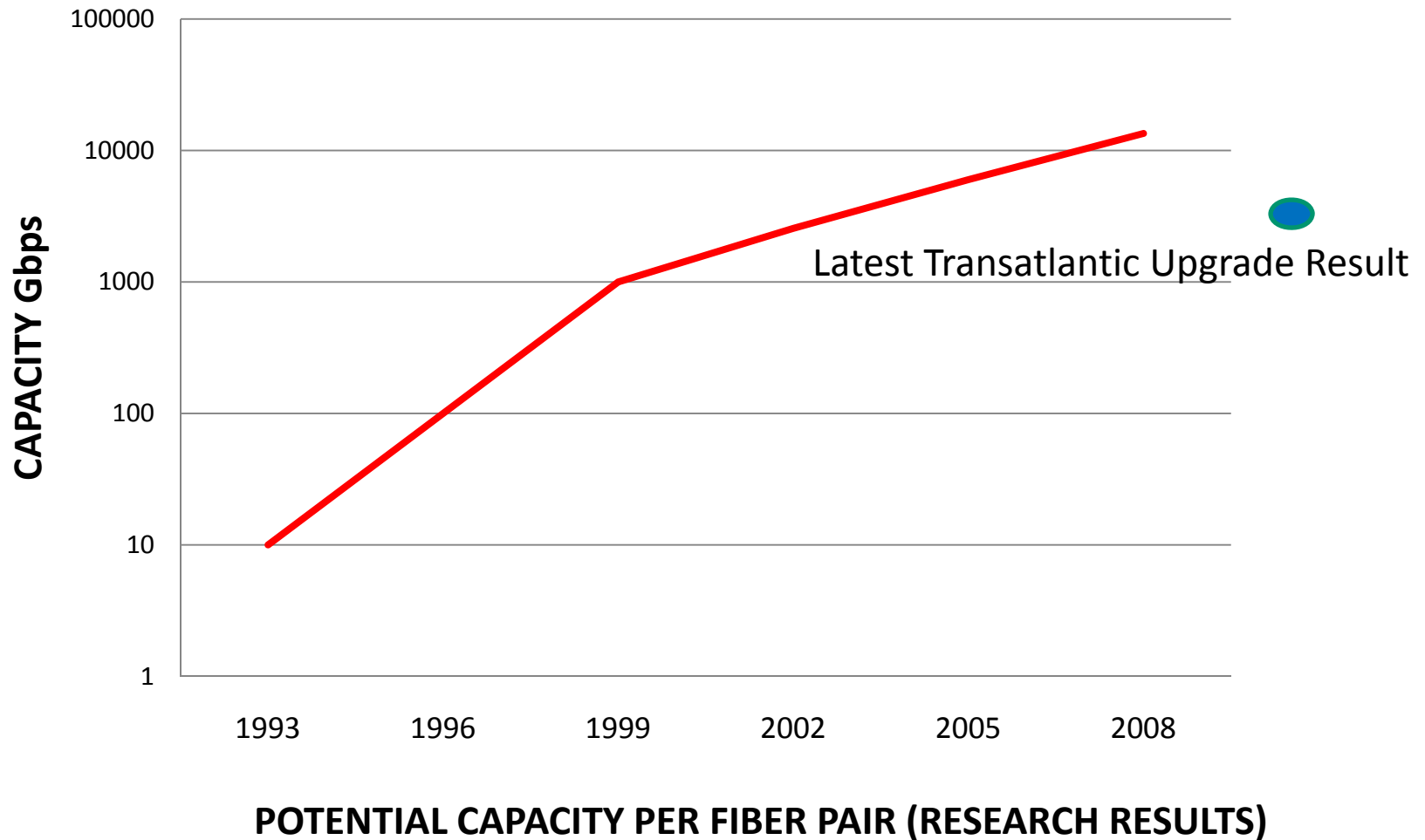
Lit Submarine Capacity by Route, 2002-2009

Source: TeleGeography

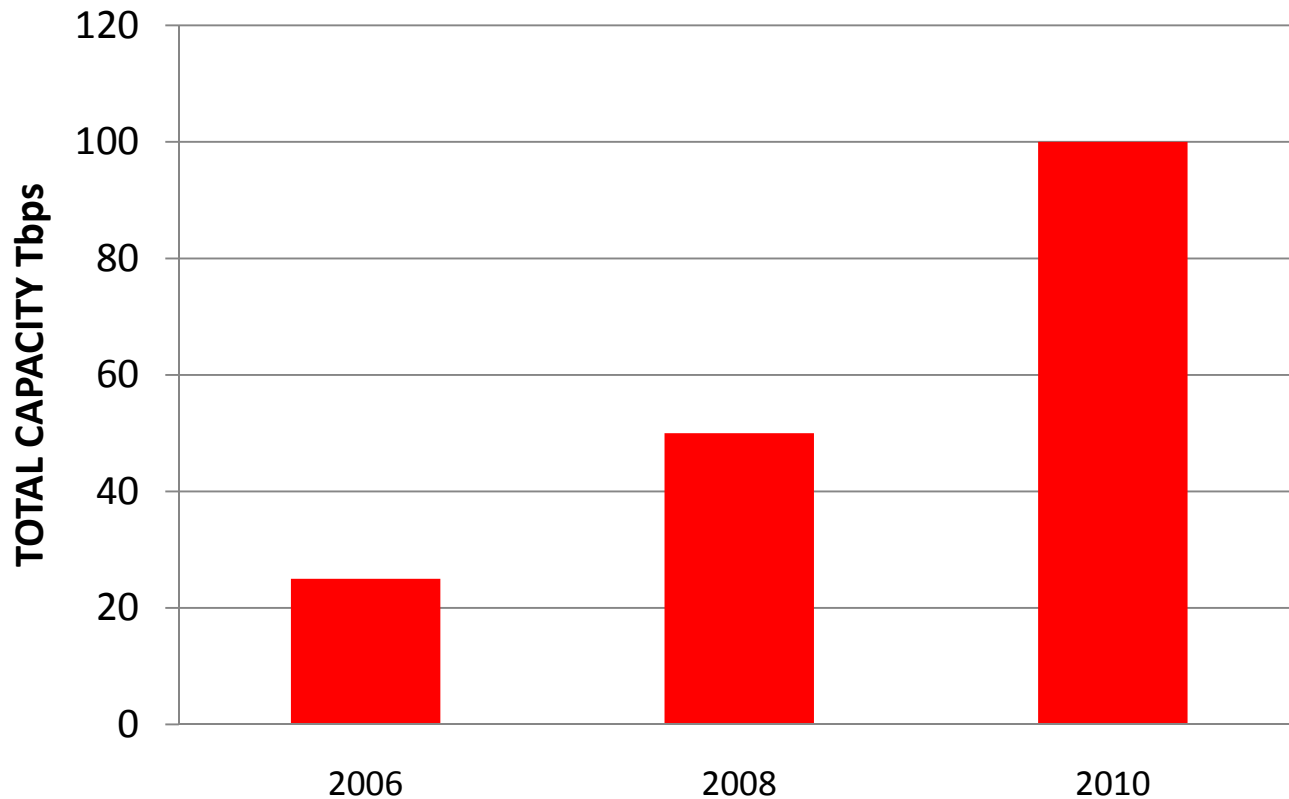
Focus on the Atlantic Basin

- **The most competitive capacity market on Earth**
- **13 transoceanic cable spans built on one route
1998 – 2003**
- **No new systems in past 7 years**
- **Over 10 Tbps of upgrades in that period**
- **When will operators build new systems?**

Upgrade Technology has Continued to Advance

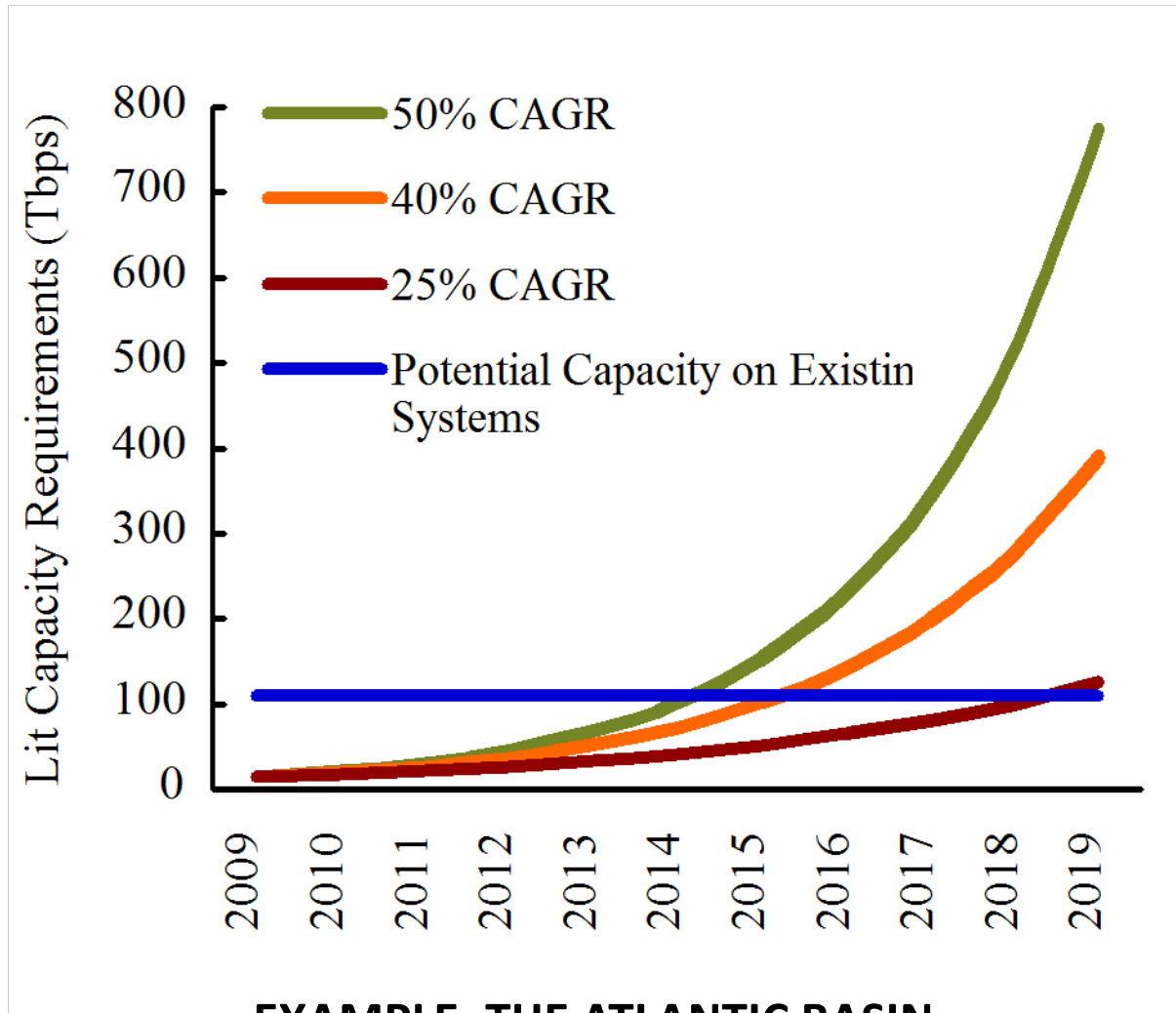


Estimated Ultimate Capacity Has Grown



ESTIMATED TOTAL POTENTIAL CAPACITY OF ALL SYSTEMS IN THE ATLANTIC BASIN

Still, Demand Will Eventually Outstrip the Capacity of Upgraded Systems

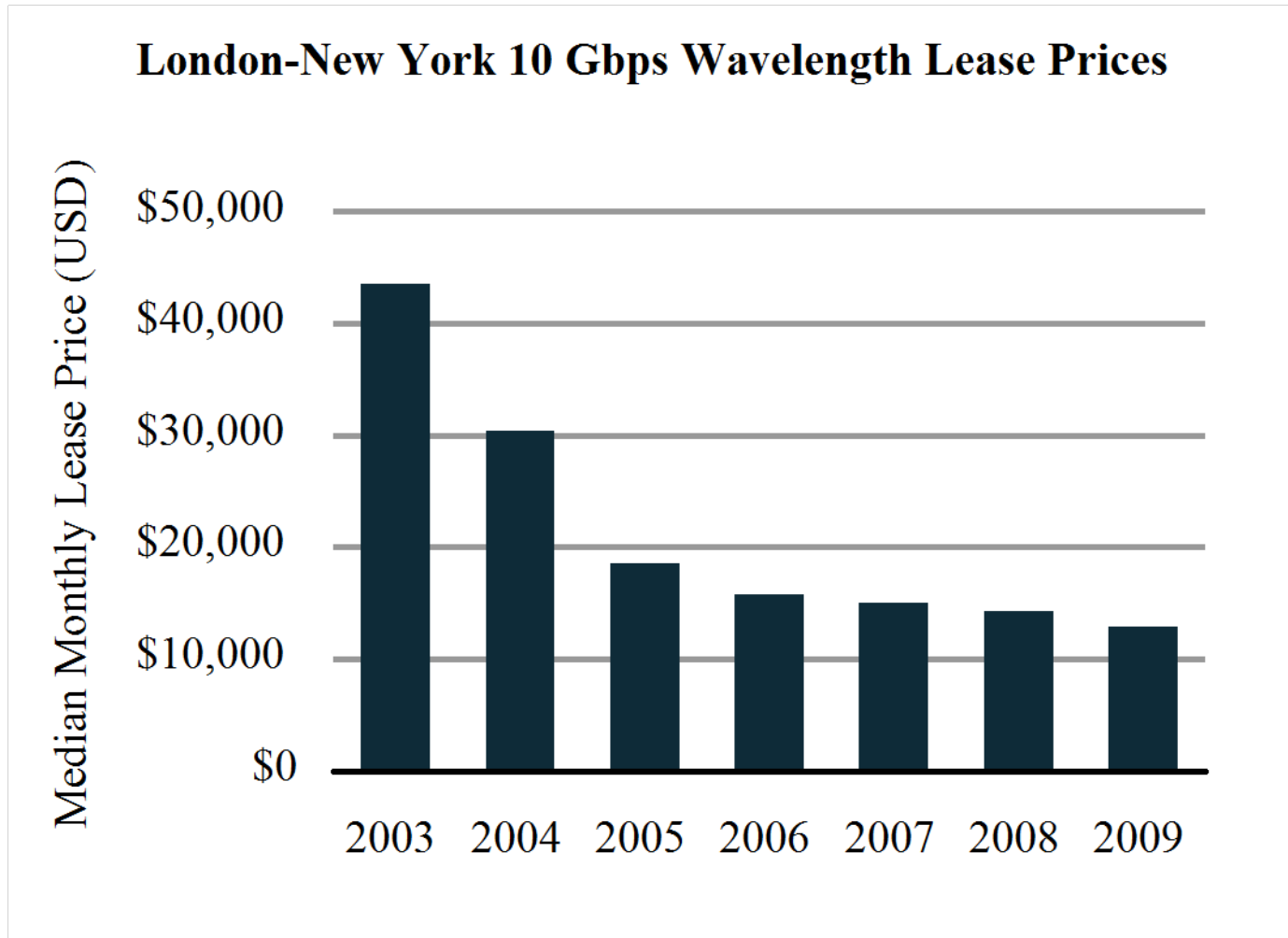


EXAMPLE: THE ATLANTIC BASIN

When To Build Rather Than Upgrading?

- **When seeking more capacity than an upgrade can deliver**
- **When seeking enhanced route diversity**
- **When seeking lower latency**
- **When seeking enhanced market share**
- **When seeking entry into a new market**

The Downside of Rapid Growth: Falling Prices



Source: TeleGeography

Is it Feasible to Build When Prices are so Low?

- Yes, if:
 - Demand is growing faster than prices are falling
 - Demand is high enough such that the product
Demand X Price X Market Share
compares favorably with system capital and operating costs

If present growth trends continue, in the next few years demand in the Atlantic will be high enough that it will be feasible to build for an operator who can capture about 15% of the incremental market

Conclusion

- Demand growth throughout the world requires a continual investment in new capacity
- Technological advances have made it possible to upgrade systems much further than their original design capacity
- Still, operators will find it necessary or desirable to build new systems for a variety of reasons
- It is feasible to build new systems when necessary even in the most competitive low-price markets
- ***How to Cope With Demand Growth?***
Upgrade AND Build, each in its own time.

THANK YOU FOR YOUR ATTENTION!

David Ross

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