

# Executive Summary



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The dual crises of supply glut and demand drought have ravaged the submarine cable industry, leaving in their wake manifold bankruptcies, rampant pessimism, and widespread uncertainty. Who is left? Will demand continue to lag? Where are prices going? *International Bandwidth*—TeleGeography's two-part annual report on bandwidth markets—answers these questions and provides the reader with the underlying data for self-guided inquiry.

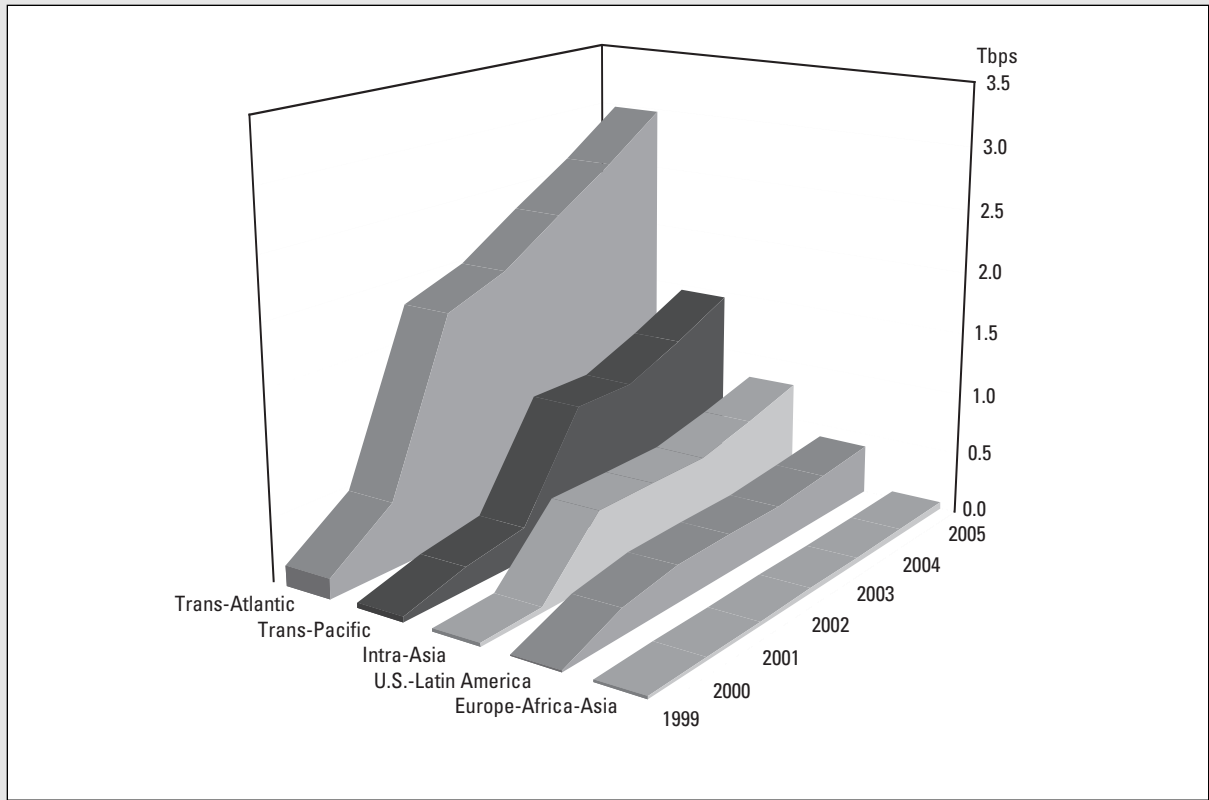
*Submarine Networks*, the first volume of *International Bandwidth 2003*, quantifies past, present, and future subsea capacity supply and demand; offers a primer on bandwidth products, contracts, and technology; reviews data on cable construction, upgrade, and maintenance costs; and presents detailed analysis and data for circuit and wavelength pricing. The report also includes detailed, two-page profiles of 66 undersea cable networks. The second volume of the *International Bandwidth* set, *Terrestrial Networks*, extends the analysis and statistics to long-haul networks on land. Although each volume can stand on its own, the two legs of the report are designed as complements. The precis below presents the most important findings in this year's research on submarine network market supply and demand.

## Supply

The supply of submarine bandwidth has grown spectacularly over the past four years. As of early 2003, total trans-Atlantic lit capacity stood at 2,338 Gbps—more than 14 times the 163 Gbps of capacity in service in 1999. A similar supply explosion occurred along other submarine cable routes as well (see Figure 1. Lit Submarine Cable Capacity Trends by Route, 1999-2005). This unprecedented run of cable construction has left investors dry, and virtually no new cables or capacity upgrades are planned for 2003.

Unfortunately, bandwidth suppliers' financial projections did not meet economic reality. The results for highly-leveraged private network builders have been catastrophic. 360networks' bankruptcy in 2001 preceded similar moves by Global Crossing and FLAG Telecom in 2002. Simultaneously, dozens of carriers that owned capacity on consortium cables or were customers on private cables have declared bankruptcy. Still, however, most of these companies have managed to keep their businesses running during financial restructuring and have not turned off large segments of their networks.

**Figure 1. Lit Submarine Cable Capacity Trends by Route, 1999-2005**



Notes: Capacity figures denote lit, protected capacity at the end of the respective year. Projected capacity assumes cables with upgradeable capacity will increase total cable capacity 20 percent each year until fully upgradeable capacity is achieved. Intra-Asia capacity includes cables with landings in both Hong Kong and Japan. Trans-Pacific capacity excludes Southern Cross and PacRim East. Trans-Atlantic capacity excludes Atlantis-2. Cables retired prior to year-end 2003 excluded from Fully Upgraded capacity.

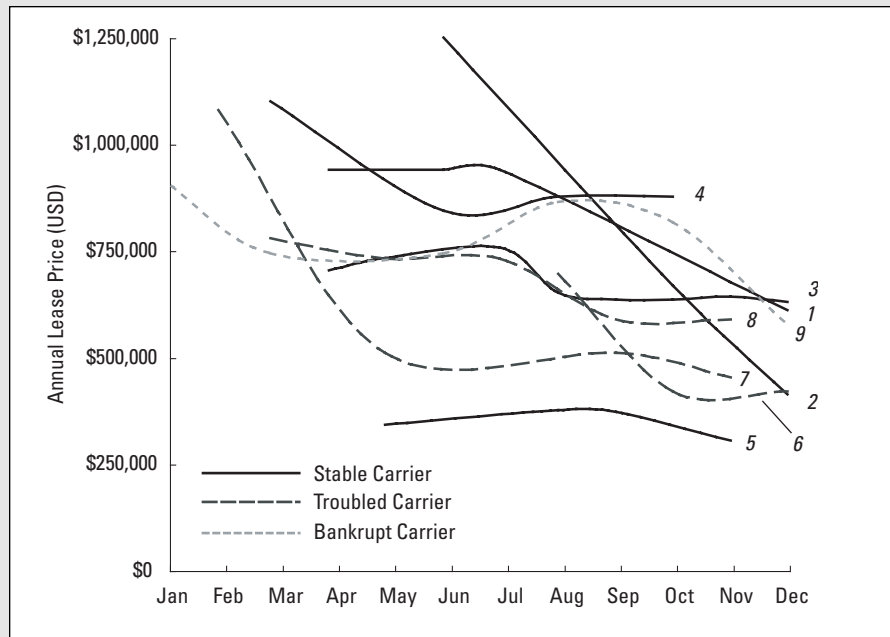
Source: TeleGeography research

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In part because no submarine network operator has yet to shut down a cable, a capacity glut continues to exist on every major route. In the turbulent undersea cable industry, however, one comes to expect the unexpected. Just as operators have been forced to accept downward revisions in their previous demand projections, a downward adjustment in supply remains possible.

### Capacity Prices

The surge of new submarine capacity—and competition among suppliers—has had a particularly strong effect on capacity prices. In early 1998, prior to the launch of Global Crossing’s Atlantic Crossing-1 cable, 155 Mbps STM-1 IRUs on the Gemini cable sold for \$11.5 million. Less than five years later, in December 2002, the entire 360atlantic cable, representing the equivalent of more than 1,000 STM-1s of lit capacity, was sold for approximately \$17.0 million. While an STM-1 circuit and an undersea cable are not directly comparable, the low sale price of the 360atlantic cable reflects bandwidth market trends.

**Figure 2. Hong Kong-Tokyo STM-1 Annual Lease Price by Carrier, 2002**

Notes: Prices reflect STM-1 annual lease prices offered by major carriers in 2002.

Source: TeleGeography research

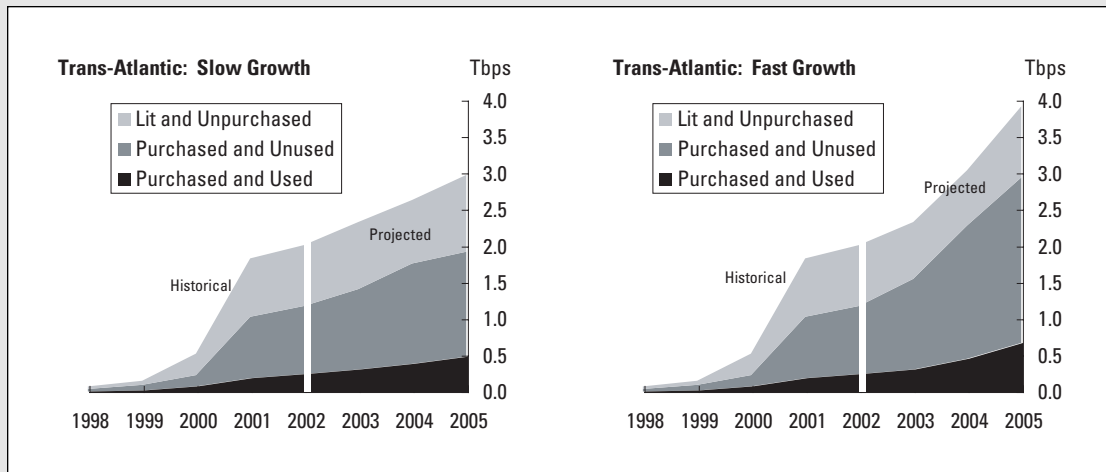
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Capacity prices have dropped at a breathtaking rate on most major routes. Both trans-Atlantic and trans-Pacific STM-1 lease prices have fallen by more than 80 percent since mid-year 2000, and by more than 95 percent since 1998. However, significant differences in carriers' prices still persist, with respect to both relative price levels and the rate of decline. Moreover, individual carriers' prices still diverge widely from median prices on many routes.

The frequency with which providers have modified their prices in the past year suggests that few carriers have a "grand strategy" with respect to price (see Figure 2. Hong Kong-Tokyo STM-1 Annual Lease Price by Carrier, 2002). Given the current state of turmoil in the industry, it is not surprising that carriers are having difficulties adjusting to the market. Some companies have simply kept prices high and accept that they will win little new business. Others have adjusted their prices on an almost monthly basis, in an effort to adapt to the changes they perceive in the market. Interestingly, there is little evidence, thus far, to support the widespread theory that carriers coming out of Chapter 11 are using their reduced debt levels to price services more aggressively than rival carriers.

The overarching factor driving prices is the dire state of the undersea bandwidth market—and, by extension, bandwidth sellers' financial health. Most trans-Atlantic bandwidth providers will acknowledge that circuit prices are ruinously low. However, many suppliers have found themselves long on capacity and short on revenues. Unless they

**Figure 3. Lit, Purchased, and Used Trans-Atlantic Submarine Bandwidth: 1998-2005**



Notes: Lit capacity assumptions: Projected capacity assumes cables with upgradeable capacity will increase total capacity 20 percent each year until fully upgradeable capacity is achieved. Lit capacity will remain at a minimum of 125% of purchased capacity. Bandwidth for systems with redundant capacity used for protection (e.g., self-healing rings) includes protected capacity totals only.

Purchased capacity assumptions: Bandwidth purchased by carriers and ISPs increases at a 4:1 margin over capacity used in their networks.

Used capacity assumptions: See notes to Figure 1 on page 108 for a detailed list of used capacity assumptions.

Source: TeleGeography research

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cut prices to meet or beat rivals' prices, they will face the prospect of no revenues. In the current situation, many suppliers have opted to slash prices, even if it means selling below long-term costs.

## Demand

In many industries, it would seem absurd to fret over sales that have softened from triple-digit to “mere” double-digit annual growth. However, in the seemingly irrational undersea bandwidth markets characterized by chronic oversupply, any demand slow-down translates to several more months—or years—of supply/demand disequilibrium. TeleGeography’s bandwidth demand analysis presents original research findings on how bandwidth buyers have deployed new capacity into their own networks (voice, Internet, and non-Internet data networks) and at what pace. These bandwidth usage data indicate that network deployments have slowed dramatically—particularly for the Internet. Similarly, a review of announced capacity contracts and bandwidth provider sales revenues indicates that capacity purchases have followed network deployments in a downward trend. Purchased transoceanic bandwidth increased by only 30 percent in 2002 compared to a 216 percent increase in 2001, suggesting that the undersea bandwidth glut may linger longer than anticipated.

Fortunately for bandwidth providers facing uncertain demand conditions, future undersea capacity levels are not set in stone. DWDM upgrade technology gives cable owners the ability to tailor future supply increases to suit demand conditions. To approximate future supply, the TeleGeography model assumes that cables with

upgradeable capacity will increase total capacity 20 percent each year until fully upgradeable capacity is achieved. However, a re-acceleration of Internet growth to 50 percent would likely lead cable owners to upgrade capacity more quickly than projected. Conversely, if network deployments for Internet and other data networks slow to 25 percent annual growth, undersea bandwidth providers may upgrade more slowly than projected (see Figure 3. Lit, Purchased, and Used Trans-Atlantic Submarine Bandwidth: 1998-2005).

## Seeking Stability

The submarine network market is in disequilibrium. Capacity and competition exceed demand. Prices plummet more quickly than modest increases in demand can justify. How long will it take for the matrix of supply and demand to right itself? Thankfully, the supply side of the problem appears to have begun fixing itself. No new transoceanic network construction is planned, and no existing system upgrades have been announced. Bandwidth prices have also shown some signs, however tenuous, of hope. Although most submarine capacity prices continue to fall rapidly, prices on some highly competitive terrestrial routes have begun to stabilize. In fact, TeleGeography's research shows that STM-1 prices between some cities have even experienced small increases (see *International Bandwidth 2003 Volume 2: Terrestrial Networks* for more information). While such trends are encouraging, market skepticism will likely continue to characterize the industry for some time to come. 🚫

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