EXECUTIVE SUMMARY

2004 is undoubtedly a watershed year for the worldwide telecommunications industry. After three dismal years during which vendors struggled to stay solvent while carriers delayed or tabled major planned upgrades to their networks, the industry is now regaining the two necessary ingredients for a real recovery: competition and capital.

Telecom Recovery Investment Opportunities takes a hard look at the capital side of the telecom equipment market to answer the following critical questions:

- What are the likely acquisition strategies of the major incumbent vendors?
- Which startups are most likely to become acquisition targets in coming months?
- Which startups are in best position to enter the public market via IPO?
- Which market segments present the best potential opportunities for venture investors, and which present the greatest risks?
- Who is investing in telecom systems markets today?
- How confident are venture capital firms about the telecom recovery?
- Which telecom equipment market segments are VCs most interested in?

Critical to this analysis is determining the readiness of both venture capital firms and publicly traded telecom equipment vendors to reestablish aggressive investment and acquisition strategies. In this report, Heavy Reading tallies up private investments and public company market capitalization in 21 different telecom equipment market sectors to identify those sectors and companies in which the most promising investment opportunities exist – as well as those that present the greatest risk to investors.

The report includes complete investment and market-reach data for 88 public companies, 163 private companies, and over 400 venture capitalists. It contains a full listing of each VC’s known investments in telecom equipment companies, providing a detailed view of how broad (or narrow) each VC’s telecom portfolio is at this critical point in the telecom industry’s recovery cycle.

The report is essential reading for a wide range of industry participants, including the following:

Investors: What segments of the telecom equipment business offer the best risk/reward scenarios for new investments? Which segments should be avoided because of unacceptable risk? Is your startup portfolio well stocked to take advantage of the most promising market segments that will drive the telecom recovery? Which existing startups present attractive investment options?
**Startup equipment vendors:** How does your company match up against the competition in terms of product strategies? How is your market segment likely to change in coming months, and how will those changes affect your long-term business plans? How will incumbent acquisition strategies affect your position, either as an acquisition target or as an independent?

**Incumbent vendors:** What are the most attractive options available to you for expanding your product portfolio through acquisition? Which of your competitors may be eyeing the same acquisition targets? Which startups are considered the strongest in the field, and which offer the right mix of value and technology?

**Suppliers of components and subsystems:** How will investment in telecom market sectors affect demand for components and subsystems in the near and long terms? In which sectors may VCs be looking to invest at the component and subsystem level? Which product sectors are likely to gain real momentum over the next three to five years, and which ones are likely to decline?

**Service providers:** Which startups are in the best position to continue to survive and thrive, either as new public entities or as acquisitions of incumbent vendors? Which companies are emerging as the strongest from both a technological and a financial standpoint in emerging product categories like high-value IP systems?

Despite the obvious pain suffered by VC investors following the bursting of the telecom investment bubble, Heavy Reading believes that investing in telecom systems will again attract venture capital for the following reasons:

- **Market share leaders are vulnerable.** As major incumbent carriers embark on network transformations in earnest, traditional market share leaders may find themselves vulnerable to more innovative suppliers. Installed base isn’t always the key decision factor, particularly as operators look to enter new IP-oriented services markets. Often this market-share shift occurs only among leading vendors (such as Nortel Networks’ win over Lucent Technologies for the Verizon Communications softswitch contract); but in many cases we will see startups win outright on the merits (Movaz in MCI) or play a role either through partnerships or via acquisitions (Ciena, via its acquisition of WaveSmith, for example).

- **Alternate operators are buying again.** The tendency to view the telecom systems market through the filter of the U.S. Bell companies is one that dashes the dreams of too many startups and VCs. A growing number of viable alternate operators throughout the world today are facilities-based, debt-free, and aggressively building out infrastructure, often with equipment from startups.

- **Incumbent vendors have gaps to fill.** In the past three years of cost-cutting, many large vendors canceled crucial R&D programs and product development, leaving gaps in their product lines that may need to be quickly filled as RFPs are released this year and next.

- **Network transformation is moving forward.** Carriers never gave up on transforming their networks – they just had to slow the pace and undertake this evolution from a sound fiscal basis. Now that free cash flow is available, they will spend in order to survive.

**SELECTED KEY FINDINGS**

Key findings from the report include the following:

- **The M&A environment will be active in 2004 as major vendors look to provide complete solutions to carriers looking to roll out converged infrastructures.** Recent acquisitions by Ciena and Juniper point to a definite upswing in M&A activity. Dominant themes will be multiservice edge, triple play, and wireless/wireline integration.

- **There will be some noteworthy IPOs coming from the telecom equipment sector in 2004.** Heavy Reading believes that at least seven telecom equipment startups will be in position to break into the public market this year. These companies have management
teams that have indicated a preference for going public, combined with a current run rate in their market segment that indicates sustainable traction for long-term growth.

- **Packet voice and video are likely to be the most important disruptive services over the next five years.** There is ample room within each area for startups to succeed.

- **The increasing urgency around the triple play of voice, video, and data will inspire acquisitions and some early-stage investing.** Triple play is now at the heart of service provider competitive strategies in a growing number of regions and markets, with cable MSOs and independent and rural local exchange carriers at the forefront of the movement. Right now, the field for triple play is wide open for equipment makers, presenting significant opportunities even to early-stage startups.

- **Technology startups are in a strong position to compete against incumbent vendors for business outside the ILECs.** Cable/MSOs, rural telcos, utilities, and municipalities looking to build multiservice networks are all in play for startups. Outside the U.S., startups continue to win business from carriers in Asia and, to some extent, Europe.

- **Some of the strongest opportunities for startups are in the access equipment sector, but some product categories within that group still pose unacceptable risk for new investment.** Case in point: Although *Heavy Reading* believes that equipment targeting advanced services for the cable/MSO market is a very attractive investment play, it sees the market for cable/MSO distribution gear as being fraught with peril for investors.

### REPORT STRUCTURE AND METHODOLOGY

**Telecom Recovery Investment Opportunities** includes financial and strategic analyses for these telecom equipment market segments:

### Access Equipment
- DSL access multiplexers (DSLAMs)
- Broadband remote access servers (B-RASs)
- Ethernet access equipment
- Fiber access equipment
- Cable/MSO equipment (distribution and advanced services)
- Multiservice access devices (including 3G digital loop carriers and broadband loop carriers)
- Free-space optics
- 802.11 wireless LAN switches

### Transport Infrastructure
- Sonet/SDH multiservice provisioning platforms (MSPPs)
- Metro Ethernet equipment
- Metro DWDM (dense wavelength division multiplexing) gear and multiservice transport platforms (MSTPs)
- CWDM (coarse WDM) systems
- Digital crossconnects (DCSs) and multiservice switching platforms (MSSPs)
- Long-haul DWDM systems
- Optical switches

### Packet Services Infrastructure
- 10-Gbit/s Ethernet switches
- Multiservice switches
- Edge routers
- Core routers

High-Value IP
- Packet voice equipment (softswitching and VOIP)
- IP service controllers

This report is the culmination of a four-month process of market segmentation, venture capital tabulation, and evaluation of private and public companies, undertaken to provide a comprehensive guide to the telecom equipment market with an eye toward determining:

1) Risks and rewards associated with various market segments for venture investing
2) Important market and technology trends in each segment of the telecom equipment market
3) Strengths and weaknesses of dominant public companies within each market segment
4) Leading private company prospects for acquisition
5) Leading private company prospects for IPO

We created extensive spreadsheets – tabulating the current venture capital in each private company participating in each of 21 critical telecom equipment market segments – then added market capitalization information on each public company active in that segment. This gives a snapshot of the current "weight" of capital in each segment. We then looked at that segment in enough detail to understand the important technology trends, the current market dynamics, and what to expect from carriers in the coming year that could change current vendor leadership status and create opportunities for startups.

These effects are captured in a scoring system for each segment. We considered six key factors, and gave each a score from 1 to 5, based on our evaluation. The factors are:

- **Rapid market growth**: Can this market segment be expected to grow at a rate sufficient to fuel the lives of a few key startups?
- **Incumbent weaknesses**: Do the incumbent vendors dominant in this space have products that meet the requirements of next-gen buildouts?
- **Startup competition**: Is this space crowded already with startups?
- **Opportunity to differentiate**: Is this a segment in which a startup can bring something unique and innovative to the market, or is it purely cost-driven?
- **Cost of capitalization**: This is of key importance to investors. Startups that require over $100 million to capitalize will be tough to justify until exit valuations increase significantly.
- **High-value exit**: Is there evidence that an IPO or acquisition at a premium is preceded and predictable?

**CONCLUSION**

*Telecom Recovery Investment Opportunities* is designed to provide a comprehensive guide to understanding the factors in each telecom systems market segment that will affect the success or failure of investing or M&A in the coming year. It provides a mix of raw data and analysis for a revealing look at the most promising – and most risky – areas of telecommunications investing.

*Telecom Recovery Investment Opportunities* is published in PDF format.