

Greater Washington

● INFORMATION TECHNOLOGY, COMMUNICATIONS & NEW MEDIA IN GREATER WASHINGTON

An Analysis by the Greater Washington Initiative



GREATER WASHINGTON
INITIATIVE
Economic Development

April 2005

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LETTER FROM THE CHAIRMAN, GREATER WASHINGTON INITIATIVE

Understanding Greater Washington's Technology Industry Today

To provide a current analysis of an industry that has weathered significant changes in the past five years, I am pleased to share the results of this latest Greater Washington Initiative (GWI) study: **Information Technology, Communications and New Media in Greater Washington.**

This study provides the first comprehensive analysis of its type since a similar study was conducted in 2000 by PricewaterhouseCoopers LLP. It serves as a useful tool in ongoing efforts to dimension and grow the Greater Washington, DC area economy. GWI plans to use this study as it continues its work to educate executives nationally and internationally about the strengths of our dynamic IT sector and the many advantages of locating or expanding an IT business in this region. It will also help policymakers identify policies to support and expand this sector.

The study will be sent to local, national and international business leaders and the media. It will also be posted online at GWI's website: www.greaterwashington.org.

Many thanks to all of the industry executives who generously gave their time and expertise to guide this work. They have added immeasurably to its credibility and value. Thanks also to GWI's Investors, whose support makes GWI's research, business development and marketing efforts possible. GWI's Executive Committee and Board of Trustees are listed on the inside back cover.

We hope you find this study useful and welcome your feedback.

Sincerely,



William Couper
Chairman, Greater Washington Initiative and
President, Greater Washington Region, Bank of America

EXECUTIVE SUMMARY

“Clearly, this is the strongest information technology area in the country right now.”

— Harris N. Miller, president,
Information Technology Association of America

Five years ago, the headlong rush into broadband expansion and dot.com speculation led to a brutal crash for Internet and telecommunications companies and their shareholders.

But before the ensuing recession had gripped the Washington area, the nation was pulled from its political moorings by the terrorist attacks of September 11, 2001. The aftermath produced a flood of federal dollars into military and security technology.

Greater Washington businesses capitalized on the spending, winning \$42.2 billion in contract awards in 2003, an unprecedented increase of \$6.1 billion over 2002. Sixty percent of the total was spent for technology services and products, according to George Mason University’s Center for Regional Analysis.

The increasing number of federal contracts made the Washington region the fastest growing metro area in the country, by far, between 2000 and 2004, with 112,300 jobs added to the economy.

Now that cornucopia is in question. While federal spending on security and anti-terrorism measures will continue, other government programs have begun to run into spending ceilings created by growing federal budget deficits. The competition for federal contracts within the region is going to get much tougher, most industry leaders predict.

“We are really at an inflection point with the federal government,” says Duane P. Andrews, chief operating officer of Science Applications International Corporation (SAIC), a contractor with 14,000 employees in Greater Washington.

A second wave of change in government and commercial markets is the convergence of the means of delivering voice, video and data over wired and wireless networks.

“The whole universe is shifting rapidly, and we are busily trying to assess the risks and opportunities so that we can continue to grow,” says Donald A. Baer, senior executive vice president, strategy and development of Discovery Communications Inc. “It is all about distribution of our content through any number of pathways that exist or may exist.”

Thousands of government contractors and commercial technology companies in the region, many of them operating within carefully planned market niches, now are facing this chaotic convergence. Even some very recent business strategies will be overtaken by new ways of transmitting information and images.

“Our strength is...taking what exists, integrating it, putting it together in a hardware, communications or software framework that allows our customers to accomplish what they want to accomplish — usually on a fairly large scale.”

— Jim Duffey, vice president for government global sales and client solutions, Electronic Data Systems

KEY TAKEAWAYS

Employment Statistics:

- >> Together, the federal core and local commercial firms have created a **regional technology workforce approaching 333,000** (one in ten area workers), **more than twice the national average**.
- >> The national capital area's number of workers in computer systems designs and related services (132,700 people) significantly outpaces all other major metro areas regions and is **three times more** than San Jose (41,500 employees).
- >> With **33,800 workers in the telecommunications sector**, Greater Washington ranks third when compared to the nation's other major metro regions.
- >> The Greater Washington region has a **higher concentration of network and computer systems administrators, database administrators and computer programmers** than the San Francisco/San Jose area or any other leading tech region in the country, according to Labor Department surveys.

Federal Government Role:

- >> Federal IT contract spending nationwide is projected to increase from \$58 billion in the 2005 fiscal year to **\$74 billion in 2009**. Experts forecast a

27% increase in federal contracts nationally for cyber security over the next five years.

- >> Federal purchases from Washington-area contractors in 2003 reached a **record \$42.5 billion, up \$6 billion from the previous year and up 21% from 1983**, driving a surge in technology hiring throughout the Greater Washington region.
- >> In 2003, less than one percent (61 companies) of Greater Washington's contracting community collected \$19 billion in contracts — **nearly half of the annual total of all federal government contracts awarded locally** — helping prove that to effectively compete in the government market space, companies clearly recognize the necessity of a capital region location.

IT Sectors:

- >> **Systems analysis** and **custom software development** are the area's most prominent IT specialties.
- >> A large number of **minority- and women-owned technology firms** in the country maintain a Washington, DC area presence and benefit from federally mandated sub-contracting policies.

This changing landscape surrounding the information technology and media industries of the Greater Washington region is seen as both a strength and a weakness.

Thanks to the record infusion of federal technology dollars, **Greater Washington leads all other major metropolitan areas in the numbers of employees in the fastest-growing technology occupations**, Census Bureau surveys document. No other metro area comes close to rivaling Greater Washington's dominance in winning federal technology contracts. The region is **home to a tech workforce of approximately 330,000 people, ranking first in the U.S. in the number of computer systems analysts, database administrators and computer systems administrators**.

Also, unlike other U.S. regions including Silicon Valley, **Greater Washington managed to maintain a stable technology workforce over the past four years**, despite significant changes in the industry's landscape. From November 2000 to November 2004, the region's tech employment fell by only 2,500 jobs.

Today, the IT tasks confronting federal agencies are on the leading edge of change. The government's need to integrate and safeguard diverse networks, and to manage vast stores of data, are templates for critical issues in commercial markets. Some of the answers may show up first in the federal sector.

“The government is also driving changes in the market,” says John D. Sanders, chairman of the Washington, DC Technology Council. “The government is often willing to be the first buyer... They will pay to have firms develop a unique solution.”

But there is a downside.

“The federal government is part of the problem as well,” cautions George Mason University President Dr. Alan G. Merten. “There is an ethic that says things will never get that bad here... No matter how many mistakes we make or how passive we are, the federal government will always provide a high level of support.”

“The good news is, the federal government is big and calls on regional partners to address its needs,” agrees C.D. (Dan) Mote, Jr., president of the University of Maryland. But, he notes, “We don’t seem to have as many companies that come here just to develop technologies for the commercial sector.” The result is a surprisingly thin linkage between university technology faculty and technology companies in the region.

The challenge of unpredictable technological change also creates opportunity for a region with a forte for solving complex telecommunications and networking problems, according to participants in this study.

“I really believe we are on the next wave of enormous technology advances,” says Elizabeth Hackenson, chief information officer of MCI. “The dot.com boom and bust, and 9/11, shook people up. I now believe we are stabilized... There is going to be tremendous innovation. We’re just starting to see it.”

Survey participants cited three areas of potential risk:

>> First, if telecommunications and networking technologies continue their rapid rate of change, it may be hard for the region’s technology firms and employees to adjust.

- >> Second, the region may face impending shortages of technology workers in key positions, made worse by high living costs and traffic congestion on commuting routes.
- >> Third, the region is well linked to the federal research and development priorities. However, it is not a national leader in commercial research and development, nor has it yet excelled in transferring government-generated technology into commercial markets.

Survey participants also suggested several actions be taken.

Those interviewed for this study urged a range of actions to address these issues, although there was consensus only on the first two:

- >> Seek more transportation solutions through stronger political action.
- >> Implement changes in federal employee security review procedures to deal with 18-month delays in obtaining high-level clearances. *See footnote on page 30.
- >> Focus IT strategies on other, non-contracting strengths of the region’s economy, such as higher education, and emerging opportunities in health care data management.
- >> Gain closer regional cooperation on economic development and quality of life issues.
- >> Create stronger research collaboration between technology employers and the region’s universities, to enrich the investigations and commercialization of new technologies.
- >> In general, pay more attention at the leadership level to the region’s entire array of competitive challenges and opportunities.

METHODOLOGY

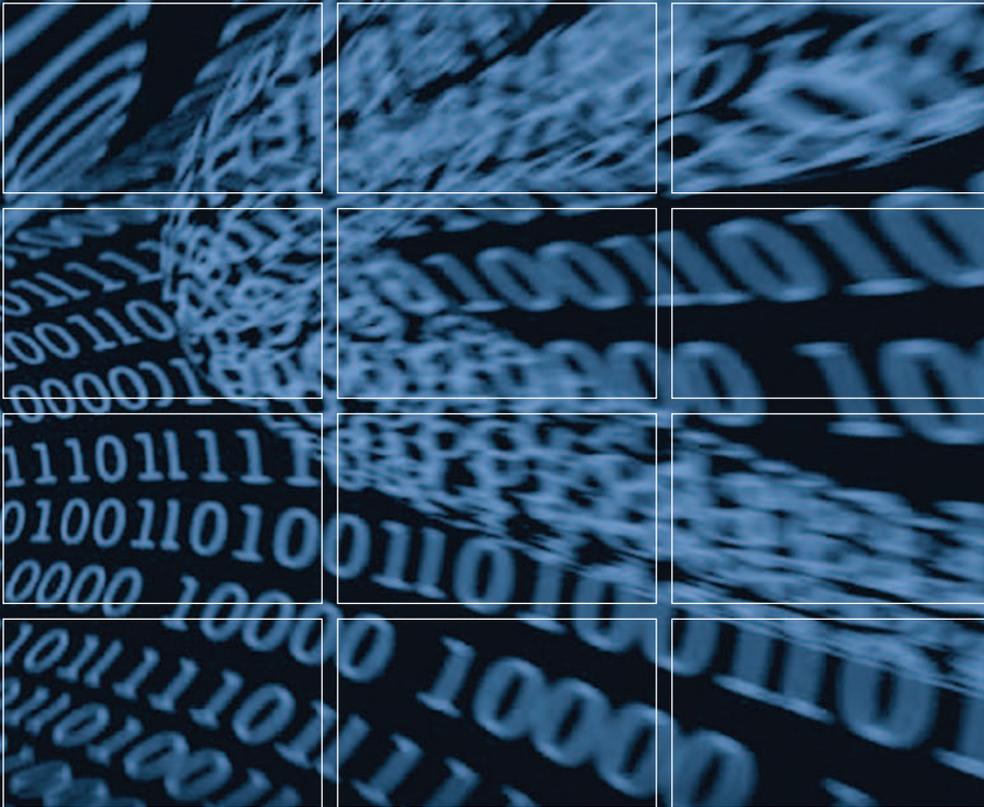
This study's purpose is to provide a current analysis of the Information Technology, Communications and New Media industry in Greater Washington. Special emphasis has been placed on current trends in the overall industry and its sub-clusters, near-term outlook, government versus commercial markets, regional strengths and challenges and data comparing Greater Washington with other technology regions.

GWI assembled a distinguished IT Study Advisory Committee of private- and public-sector executives who provided expert guidance to GWI's in-house study team. In addition, the Initiative contracted with two consultants to provide survey assistance (including conducting personal interviews with executives) and to author the report. Brad McDearman, president of McDearman Associates, an economic development consulting firm, and Peter Behr, formerly with *The Washington Post*, performed the survey research. Mr. Behr, author of the study, has expertise in research and economics and has written extensively about the region's IT/Communications sector.

The information used in the analysis of Greater Washington's Information Technology, Communications and New Media sector consists of the interviews of 39 top-level executives, as well as federal data available through the Labor Department on the fastest-growing occupations and employment level trends throughout the industry. Executive interviews and research were conducted between October 2004 and February 2005.



● OVERVIEW



“ The Washington area economy is different. It has always been different, but now these differences are propelling the economy’s growth. ”

— Stephen S. Fuller, Ph.D.,
director, Center for Regional Analysis,
School of Public Policy, George Mason University

“The presence of the federal government, a highly educated workforce, solid population trends and the development of the local technology hub will enable [the] Washington region to maintain above average growth over the forecast horizon.”

— Economy.com Inc. Forecast, September 2004

Over the past four years, the trajectory of the Greater Washington region’s economy veered away from the rest of the nation, breaking out of the downturn triggered by collapse of the dot.com bubble and the terrorist attacks of September 11, 2001.

Led by the capital’s Northern Virginia and Maryland suburbs, the Washington area generated 223,000 net new jobs between November 1999 and November 2004. No other metropolitan area in the country came close: Las Vegas, with 144,000 new jobs, was second. The technology centers around Silicon Valley, Boston, Dallas and Atlanta all suffered **a net loss of jobs** over the same period.

TOTAL EMPLOYMENT

| Region | Employment Change (Nov. 2000 – Nov. 2004) |
|------------------------|--|
| Greater Washington | 112,300 |
| Atlanta | (17,000) |
| Boston | (149,400) |
| Dallas | (84,700) |
| Los Angeles | (77,200) |
| San Francisco/San Jose | (362,400) |

Source: Bureau of Labor Statistics, Non-Farm Employment, Department of Labor

The new exigencies of the post-9/11 world have driven this growth. For more than a quarter century, the nucleus of Greater Washington’s technology industry has been defined by the evolving needs of the federal bureaucracy and contractor firms that clustered around the capital to meet those requirements.

Over those years, the federal nucleus became ringed by commercial companies engaged in telecommunications, satellite transmission, biotechnology, Internet applications and the creation of technology-dependent media. While many of these commercial firms pursued customers and consumers outside the government realm, their businesses tended to be linked to federal research or regulatory decisions, or were commercial offshoots of government technology.

Together, the federal core and the commercial firms in the federal orbit have created a Greater Washington **technology industry approaching 333,000 people**, according to Department of Labor surveys, or one worker for every ten in payroll jobs — **twice the national average**.

THE FEDERAL CORE

OVERVIEW

“You are hard pressed to find another area that is more intensive and advanced in communications and information technology.”

— C.D. (Dan) Mote, Jr., president,
University of Maryland

The region's economic surge in this decade came from that center — the federal contracting community. More than 12,000 companies fill this space, from defense giants like Lockheed Martin and Northrop Grumman to niche subcontractors with a few dozen employees scattered throughout the region.

- >> Federal purchases in the region jumped by \$4.7 billion in the 2002 fiscal year and \$6.1 billion the following year reaching a record, according to the Center for Regional Analysis at George Mason University.
- >> An estimated two-thirds of that spending went for technology services and products, according to the Center's Stephen S. Fuller, Ph.D. He estimates that each \$1 billion in additional federal outlays in the region adds 7,000 new jobs.

The federal agenda continues to grow and become more complex. It includes designs for command networks for future electronic battlefields; efforts to merge hundreds of different agency communications and database systems; creation of security systems for top-secret intelligence; and the management of immense databases containing government archives and case records of diverse populations, from veterans and aid recipients to terrorism suspects.

The new defense and security priorities resonate in the research agendas of Washington area universities and colleges, where new initiatives have been launched and new funding provided to existing programs. Among them:

TOP TEN FEDERAL CONTRACTORS IN GREATER WASHINGTON

| Fiscal Year 2003 | Amount Awarded |
|--|----------------|
| 1 Science Applications International Corp. | \$1.5 billion |
| 2 Computer Sciences Corp. | \$971 million |
| 3 Booz Allen Hamilton Inc. | \$920 million |
| 4 Northrop Grumman Information Technology | \$897 million |
| 5 Lockheed Martin Corp. | \$821 million |
| 6 Electronic Data Systems Corp. | \$803 million |
| 7 International Business Machines Corp. | \$678 million |
| 8 NCS Pearson, Inc. | \$630 million |
| 9 Unisys Corp. | \$615 million |
| 10 Accenture LLP | \$567 million |

Source: Center for Regional Analysis, George Mason University

- >> The Center for Secure Information Systems at George Mason University, the nation's first university program on information systems security.
- >> Center of Excellence in Command, Control, Communications and Intelligence at George Mason University, the leading university-based research program on this subject.
- >> University of Maryland Center for Advanced Study of Language, which uses technology to address security and intelligence issues involving foreign languages.

OUTLOOK

Federal information technology spending nationwide is projected to increase from \$58 billion in fiscal year 2005 to \$74 billion in 2009, says Payton Smith, director of market analysis at Input Inc. On top of that is another \$10 billion in estimated spending on classified technology programs, most of which is done in the capital region, he says.

But the spending will be skewed. More than half will be earmarked for the military and the agencies comprising the Department of Homeland Security, under current federal budget proposals.

Technology executives are debating how the civilian agencies' technology spending will stand up in the face of budget pressures.

“The federal marketplace — military and civilian — will grow at mid-to-high single digits rates. A good proportion of that spending will occur in homeland security... It is unquestionable that the consolidation of 22 agencies into a new agency called Homeland Security will create a host of challenges, all of which have an impact on opportunities for IT companies.”

— Jim Duffey, vice president for government global sales and client solutions, Electronic Data Systems

“Government is doing more with less. This means more IT. This mirrors the commercial market. They are finding ways to solve problems with IT.”

— Richard L. Landry, chief executive officer, Conquest Systems, Inc.

“We project that civilian IT spending will flatten out. Government spending has been increasing the last five years. It has had a disproportionately positive impact on this region.”

— Harris N. Miller, president, Information Technology Association of America

“Overall federal spending is going to slow significantly. But most of the cuts will come in the major weapons programs. Homeland security and defense are going to continue to increase. So the IT part of the budgets will probably still see a three to five percent growth.”

— Duane P. Andrews, chief operating officer, Science Applications International Corp.

“I'm concerned about the budget deficit problem. This will impact our business even though there is great demand for IT hardware and services.”

— Dendy Young, chairman and chief executive officer, GTSI

FEDERAL INFORMATION TECHNOLOGY SPENDING — U.S. FORECAST

| Federal Agency | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|----------------------------------|----------------|----------------|----------------|----------------|----------------|
| Defense/Civilian Agencies | \$57.5 billion | \$62.4 billion | \$66.9 billion | \$70.8 billion | \$74.6 billion |
| Intelligence Agencies (estimate) | \$9.4 billion | \$10.2 billion | \$10.9 billion | \$11.5 billion | \$12.1 billion |

Source: Input Inc., based on 2004 data

THE COMMERCIAL SECTOR

OVERVIEW

The largest cluster of commercial technology firms in the region is in the telecommunications sector, whose origins lie in the federal government's entry into satellite transmission services in the 1960s and a pioneering company named Microwave Communications Inc. Renamed MCI, it launched regulatory and legal battles that ultimately forced the breakup of AT&T's historic telephone service monopoly.

Technicians and executives who left MCI populated the region's telecommunications industry, attracting capital and competitors.

In 2000, Greater Washington had a host of companies marketing wireless and long-distance phone service, manufacturing state-of-the-art communications and data routers and switches, and operating and securing telecom networks, including those built on fiber optic technology. The region claimed the third-largest cluster of telecom workers in the nation, trailing only metropolitan Atlanta and Dallas.

When the speculative scramble to expand communications and Internet capacity created a nationwide bandwidth glut, nearly 11,000 telecommunications jobs in the region were wiped out. Of the major metropolitan centers, only Dallas suffered heavier losses in telecommunications between 2000 and 2004.

TELECOMMUNICATIONS EMPLOYMENT

| Region | Number of Employees | | Percent Change |
|--------------------|---------------------|-----------|----------------|
| | Nov. 2000 | Nov. 2004 | |
| Greater Washington | 44,600 | 33,800 | (24.2%) |
| Atlanta | 53,100 | 43,700 | (17.7%) |
| Chicago | 38,500 | 32,100 | (16.6%) |
| Dallas | 55,500 | 35,500 | (36%) |
| Los Angeles | 36,500 | 25,800 | (29.3%) |

Source: Bureau of Labor Statistics, Non-Farm Employment, Department of Labor

Even so, Greater Washington still ranked third in telecommunications employment among major metro areas in 2004. The two largest firms, Nextel and MCI, both targeted for mergers, are among the region's largest technology employers. Behind them are established firms such as Hughes Network Systems Inc. (high-speed satellite Internet access services), Spirent Communications (technology support systems for Internet and satellite networks) and rising competitors Imphonic and iDirect Technologies.

"It is very helpful to be near the FCC. We know what's going on," said Tom Faulders, chairman, president and chief executive officer of LCC International Inc., whose 1,000 employees provide engineering and consulting services to wireless communications firms worldwide.

"We are a creature of the FCC," says Chance Patterson, vice president, corporate affairs of XM Satellite Radio, which launched its pioneering multi-channel satellite radio service for motorists with a \$90 million federal radio spectrum license in 1997. XM Satellite Radio chose the District rather than its suburbs because the capital's urban energy mattered to an entertainment company.

But the Washington area stands to lose one hugely important magnet that drew telecommunications entrepreneurs to Washington — the need to be near federal regulators and lawmakers whose policies were crucial to the industry's evolution.

"The breakup of AT&T led to years of government-managed competition," says Scott Cleland, founder and CEO of Precursor Inc., a Washington-based research group. "Companies created the telecom-legal-industry complex, using the regulatory process to create businesses. That trend is over," he said. Regulatory skirmishes will continue, but the industry's future now hinges on technology.

Notwithstanding the business failures, layoffs and mergers in the telecommunications cluster, a critical mass of talent persists in the Greater Washington region that will fuel innovation, some experts predict. "You've got

engineers and people who know how to build those businesses, the capital infrastructure and the lawyers. You have an infrastructure that is conducive to growth,” said telecommunications investor Ralph Terkowitz, general partner with ABS Capital Partners.

The unpredictable struggle over the delivery of voice, data and images impacts those that create media, as well as distribute it.

“IT is in a transformation. There is so much new technology allowing us to bridge networking and computing together that many companies like MCI are really redefining themselves. We’re saying, how can we leverage these new technologies in offering products and services to customers?”

— Elizabeth Hackenson, chief information officer, MCI Corp.

America Online, Inc. (AOL) put the Washington region on the Worldwide Web map, providing Internet access to one out of two online households in the nation by 1999. Now a division of Time Warner, AOL has had to redirect its strategies to cope with intense competition from telecommunications and cable companies offering broadband access. Its future hinges on mastery of a wide range of converging telecommunications and networking technologies.

Stephen Swad, executive vice president and chief financial officer of AOL, says the company will continue to plug the online subscription portal that built the company, but also will emphasize special features like its Instant Messenger service and Internet photo applications, where the technology is still evolving rapidly. Swad says AOL also must perfect new ways to deliver content, notably voice over Internet. “I see our service being sent to cell phones and mobile devices and to TVs and stereos,” he says. Some services will be free, supported by streaming advertising messages. All of the applications require the company to keep innovating.

INTERNET SERVICE PROVIDERS

| Region | Number of Employees | | Percent Change |
|--------------------|---------------------|-----------|----------------|
| | Nov. 2000 | Nov. 2004 | |
| Greater Washington | 31,600 | 23,500 | (25.6%) |
| Chicago | 17,700 | 14,100 | (20.3%) |
| Dallas | 21,400 | 16,800 | (21.4%) |
| Los Angeles | 18,900 | 11,600 | (38.6%) |
| San Jose | 18,000 | 11,600 | (55.1%) |

Source: Bureau of Labor Statistics, Non-Farm Employment, Department of Labor

“The new media opportunities are critically important to us and our future.”

— Donald A. Baer, senior executive vice president, strategy and development, Discovery Communications Inc.

Discovery Communications, Inc., parent of The Discovery Channel, has moved far beyond its origins as a programming source for expanding cable television networks in the 1980s. Now, it must stay ahead of new opportunities to access and distribute its programs, whether to customers’ personal computers and hand-held devices, or to students’ classrooms. Its horizons now must stretch to include wireless technology and database access and retrieval, as well as new ways of creating and presenting its programs.

XM Satellite Radio in the District is the leading supplier of subscription radio broadcasts delivered to motorists via satellite. The company creates and broadcasts more than 100 channels of tailored radio broadcasts, from high-brow classics to hip hop and old-time radio favorites. While broadcasting content is its product, at its core it is a technology company, says Chance Patterson, vice president, corporate affairs. He cites a new service that XM has developed that feeds digital updates about road accidents and traffic congestion as text and graphics information on computer consoles in customers’ cars.

1957:

The Soviet Union's launch of Sputnik ignites a superpower space race and a new front in government-backed technology development.

1964:

As the Vietnam War escalates, Secretary of Defense Robert S. McNamara builds a core of analysts who use the fast-growing power of mainframe computers to attack complex strategic and logical issues.

1968:

Microwave Communications Inc. (MCI) is founded. William G. McGowan relocates the company in 1972, choosing a site in downtown Washington, DC to be near federal regulators and prosecutors, whose decisions would be pivotal in MCI's future.

1975:

HBO becomes a national cable television service by using a communications satellite to distribute its signal. Ted Turner's TBS debuts the following year.

1980:

Robert L. Johnson founds Black Entertainment Television (BET) in the District. In 2001, he sells it to Viacom for nearly \$3 billion.

Early 1980s:

Reagan-era defense buildup begins with an infusion of federal contracts for military technology in electronics, software design and systems management. Equally importantly, Reagan administration policies accelerate the outsourcing of complex technology management operations to government contractors. "Mega contracts" exceeding \$100 million are awarded.

1982:

MCI's long legal battle with AT&T leads to a court agreement to break up Ma Bell at the beginning of 1984, opening telecommunications markets to competition.

1992:

Human Genome Sciences Inc. is founded.

Network Solutions takes over assignment of Internet addresses from the government.

AOL raises \$66 million in public offering.

1994:

Netscape introduces the first commercial Web browser, giving consumers easy access to the Internet.

1995:

AOL adds Web browsers and later purchases CompuServe and Netscape. By 1999, nearly half of all home U.S. computer users are getting online through AOL.

Northern Virginia technology entrepreneur Mario Morino and other business leaders form the non-profit Potomac KnowledgeWay. Its Netpreneur Program permits novice entrepreneurs to trade ideas with technology executives at breakfast seminars. More than 15,000 people attend the sessions before the program ends in 2003.

2000:

AOL and Time Warner announce a \$112 billion "merger of equals," uniting the online leader and the entertainment conglomerate. AOL shareholders would own 55%, and AOL chief executive officer Steve Case becomes chairman.

Lockheed Martin Corp. successfully purchases all the remaining shares of Comsat Corp. InfoComm study of Greater Washington region released by PricewaterhouseCoopers LLP.

The stock of Microstrategy Inc. plummets from 333 to 10 during the year amid investigations of its accounting practices, symbolizing a devastating reckoning for overpriced technology stocks nationwide and a flight of investors from the Bubble economy.

2001:

The September 11 terrorist attacks create a massive federal investment in security technology to coordinate homeland security and intelligence IT operations across more than a dozen federal departments and agencies.

TECHNOLOGY AND MEDIA MILESTONES

1969:

The predecessor of the Internet begins operating, formed by university and government scientists seeking a communication system that might survive nuclear war. Three years later, the public gets a peek at the new network at the first International Conference on Computer Communications, held at the Washington Hilton Hotel.

1970:

Five of McNamara's "whiz kids" leave the Pentagon to form American Management Systems, a pioneering government systems integration contractor.

1971:

The National Cancer Act passes, vesting the National Institutes of Health (NIH) and the National Cancer Institute with leadership in a new war on cancer. Independent laboratories spring up to serve NIH's needs, and the region's biotech industry is born.

1983:

Congress passes the Technology Transfer Act, permitting private companies to profit from collaborative research with NIH and other federal agencies.

1984:

The Cable Communications Policy Act of 1984 ignites a nationwide expansion of cable television services, with scores of new satellite-delivered programming services.

1985:

The Internet is turned over to the National Science Foundation and becomes a "network of networks."

America Online's (AOL) precursor, Quantum Computer Services, begins offering games, news and other features.

1991:

Federal purchases from Washington-area contractors total \$14.5 billion.

1996:

Congress enacts the Telecommunications Act of 1996 after a monumental struggle, mandating more competition in local phone markets. But legal and regulatory battles continue over the application of the law.

1998:

WorldCom, Bernard J. Ebbers' Mississippi telecommunications company, buys MCI for \$40 billion. First InfoComm study of Greater Washington region released by Potomac KnowledgeWay.

1999:

A rush to capitalize on the Internet is on throughout the region, fueled by stock market fortunes amassed by industry leaders. Greater Washington technology entrepreneurs Raul Fernandez, Michael Saylor and Jeong Kim make Fortune magazine's list of the 40 richest Americans under age forty.

2003:

AOL chairman Steve Case resigns under pressure at the beginning of the year to avoid "greater distractions." AOL is dropped from the company's corporate name, remaining a division.

WorldCom files its bankruptcy reorganization plan, changes its brand name back to MCI and transplants the company headquarters back to MCI's Auburn, VA campus.

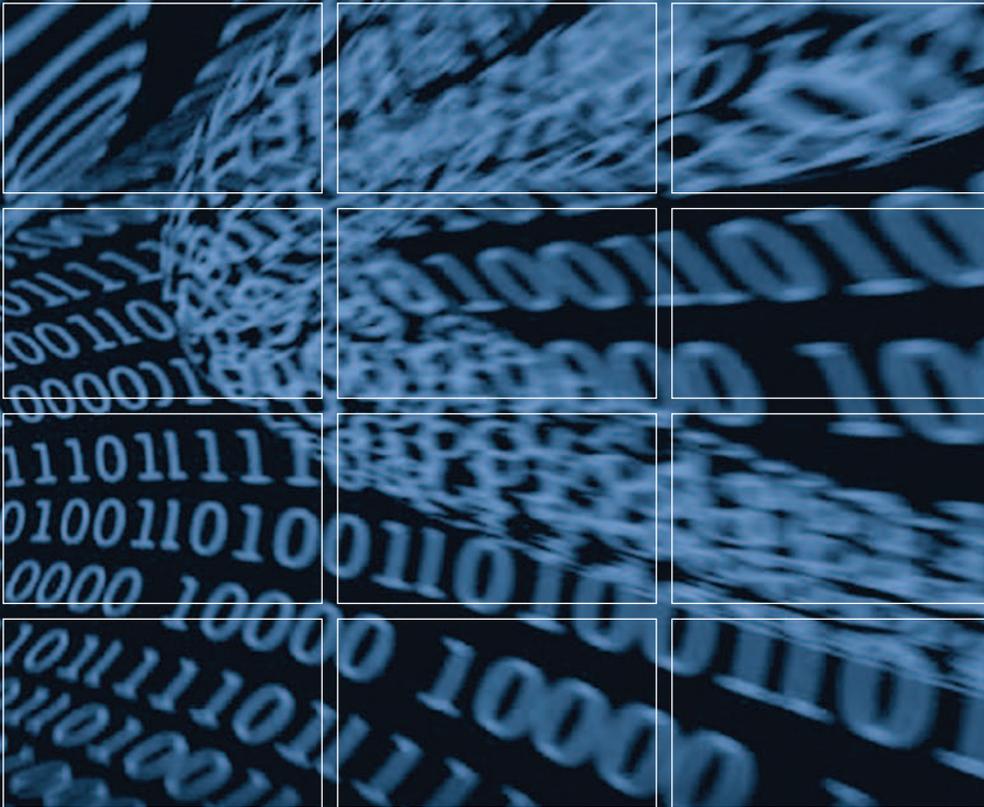
Federal purchases from Washington-area contractors reach a record \$42.5 billion, up \$6 billion from the previous year and up 21% from 1983, driving a surge in technology hiring throughout the Greater Washington region.

2004–2005:

At the end of 2004, Sprint Corp. and Nextel Communications Inc. announce a \$35 billion merger. The telecom combinations continue, reflecting a new chapter of competition and convergence in the industry. SBC Communications Inc. agrees to buy AT&T Corp. for \$16 billion, and Verizon and Quest compete to acquire MCI.



● THE WORKFORCE



“ We hire highly technical people and don’t seem to have any problems finding them. ”

— Sudhakar V. Shenoy, chief executive officer,
Information Management Consultants, Inc.

THE WORKFORCE

“People are attracted to work here because of the variety of jobs available in the region. You can move around and work on more interesting things.”

— Russ Griffith, president and chief executive officer, Datatel, Inc.

The Greater Washington region’s technology workforce is a broad pyramid (more than 330,000 people) that reaches from award-winning scientists, physicists and retired senior military officers at the top to precocious high school summer interns at research laboratories at the base. In between are tens of thousands of employees who design, create, test, build and market the systems and devices of the information age.

The makeup of the information technology workforce here is focused, predictably, on the needs of the federal government, the region’s dominant technology customer. But the pyramid’s base is broad, including James Ellenbogen’s Nanosystems Group at MITRE Corp. and the development of biometrics applications at Sudhakar V. Shenoy’s Information Management Consultants, Inc.

As indicated on the chart above, Greater Washington managed to maintain a stable technology workforce over the past four years, despite significant changes in the industry’s landscape. From November 2000 to November 2004, the region’s tech employment fell by a modest 2,500 jobs.

GREATER WASHINGTON TECHNOLOGY EMPLOYMENT

| Industry Sectors | Number of Workers | | Percent Change |
|--|-------------------|----------------|----------------|
| | Nov. 2000 | Nov. 2004 | |
| Computer and Electronic Product Manufacturing | 23,800 | 18,500 | (22.3%) |
| Telecommunications | 44,600 | 33,800 | (24.2%) |
| Internet Service Providers | 31,600 | 23,500 | (25.6%) |
| Architectural, Engineering, and Related Services | 50,700 | 55,700 | 9.9% |
| Computer Systems Design and Related Services | 124,700 | 132,700 | 6.4% |
| Scientific Research and Development Services | 40,300 | 47,500 | 17.9% |
| Other | 19,700 | 21,200 | 7.6% |
| Total | 335,400 | 332,900 | (.75%) |

Source: Bureau of Labor Statistics, Non-Farm Employment, U.S. Department of Labor
 Note: Includes all employees of companies with a technology industry classification

The region has achieved a critical mass of technology talent that makes it attractive for computer, telecommunications and Web workers to move and be here, many in the industry say.

The technology workforce is a significant contributor to the region’s pool of brain power. With 42% of the adult population holding at least a bachelor’s degree and 19% an advanced academic degree, Greater Washington ranked first in 2003 among the twenty largest metropolitan areas of the nation in educational achievement, according to a Brookings Institution study.

“We’re pulling people from all over the country, and we’re not working up a sweat... This is a very good region to bring people into. They know there are a lot of jobs here. They know if they don’t like the company they go to, they have lots of other places to choose from. It kind of feeds on itself.”

— Duane P. Andrews, chief operating officer, Scientific Applications International Corp.

The region’s technology workforce is a calmer, more ordered place now than in the wildest days of the Internet bubble. Some in the industry privately admit they miss the excitement and the seemingly wide-open frontiers. Other industry leaders don’t seem to mourn that time.

Dr. Joy R. Hughes at George Mason University said venture capitalists used to pester university professors looking for instant technology to pump into start-ups. “Now we’re seeing a more mature interest in our ideas,” she said.

“During the height of the dot.com boom it was tough. We have been successful in creating a long-term, stable environment. We find very talented people, but [their] ideas of compensation were out of whack. The dot.com made people’s expectations unrealistic. The market has normalized now.”

— Rodney P. Hunt, president and chief executive officer, RS Information Systems, Inc.

It is a very diverse workforce, reflecting a region filled with immigrants, second-generation citizens and minority group members. Tom Faulders, chairman, president and chief executive officer of LCC International, Inc., a wire-

less telecommunications services firm, has had to look overseas for the specialists he needs. Only one third of his employees are U.S. citizens.

Despite the region’s success in importing workers from other markets, however, certain tech workers can be hard to find.

“We trade employees with Nextel. We hire elsewhere in the world. We hired 40 from the Philippines last year.”

— Tom Faulders, chairman, president and chief executive officer, LCC International, Inc.

The skills in greatest demand mirror the region’s focus on adapting technology rather than creating it.

- >> “The bread and butter IT skills are systems analysis and custom software development,” rather than custom software code development, says SAIC’s Duane P. Andrews, speaking with a government contractor’s perspective. “We tend more and more to be gluing multiple [off-the-shelf] systems together and tailoring the interfaces to the customer. We don’t find enough systems engineers with system integration skills. The schools aren’t turning them out. Those that are turned out, there’s a lot of competition for them.”
- >> Jim Duffey, vice president for government global sales and client solutions for EDS, has a similarly specialized recruiting wish list. “Network management is key. Data management is key. Data mining is going to be key.” His company needs people with a first-hand knowledge of the expertise needed to take care of a particular client’s needs. “Project management and process-oriented thinking is critical to the business we do.”
- >> “We’re looking for engineers that understand [both] networks and computing. We are still looking for people who know how to code in Java, know about Web services, understand distributed environments, grid and utility computing,” said MCI’s Elizabeth Hackenson. “I would also include knowledge of business, finance and supply chain.”

Younger employees are sought for their innate familiarity with rapidly changing Web technologies, she says. Older technology specialists come from an environment which rewarded those who could build systems from scratch. Younger employees have tools to do much of that work. As a result, “they are able to put more pieces of the pie together and integrate and think a lot faster. On the other side, they don’t have the industry knowledge and experience.”

Labor Department occupational surveys define the make-up of the workforce. The largest employment cluster by far is computer-assisted design.

ARCHITECTURAL ENGINEERING AND RELATED SERVICES

| Region | Number of Employees | | Percent Change |
|----------------------------|---------------------|-----------|----------------|
| | Nov. 2000 | Nov. 2004 | |
| Greater Washington | 50,700 | 55,700 | 9.9% |
| Atlanta | 27,200 | 26,200 | (3.7%) |
| Boston | 31,200 | 30,100 | (3.5%) |
| Chicago | 36,200 | 33,700 | (6.9%) |
| Los Angeles | 30,500 | 31,600 | 3.6% |
| San Francisco/ San Jose | 37,400 | 25,200 | (32.6%) |

Source: Bureau of Labor Statistics, Non-Farm Employment, U.S. Department of Labor

TELECOMMUNICATIONS EMPLOYMENT

| Region | Number of Employees | | Percent Change |
|--------------------|---------------------|-----------|----------------|
| | Nov. 2000 | Nov. 2004 | |
| Greater Washington | 44,600 | 33,800 | (24.2%) |
| Atlanta | 53,100 | 43,700 | (17.7%) |
| Chicago | 38,500 | 32,100 | (16.6%) |
| Dallas | 55,500 | 35,500 | (36.0%) |
| Los Angeles | 36,500 | 25,800 | (29.3%) |

Source: Bureau of Labor Statistics, Non-Farm Employment, U.S. Department of Labor

INTERNET SERVICE PROVIDERS

| Region | Number of Employees | | Percent Change |
|--------------------|---------------------|-----------|----------------|
| | Nov. 2000 | Nov. 2004 | |
| Greater Washington | 31,600 | 23,500 | (25.6%) |
| Chicago | 17,700 | 14,100 | (20.3%) |
| Dallas | 21,400 | 16,800 | (21.5%) |
| Los Angeles | 18,900 | 11,600 | (38.6%) |
| San Jose | 18,000 | 11,600 | (35.6%) |

Source: Bureau of Labor Statistics, Non-Farm Employment, U.S. Department of Labor

COMPUTER SYSTEMS DESIGNS AND RELATED SERVICES

| Region | Number of Employees | | Percent Change |
|--------------------|---------------------|-----------|----------------|
| | Nov. 2000 | Nov. 2004 | |
| Greater Washington | 124,700 | 132,700 | 6.4% |
| Atlanta | 40,300 | 32,300 | (19.9%) |
| Boston | 51,700 | 31,100 | (39.8%) |
| Chicago | 45,800 | 34,200 | (25.3%) |
| San Jose | 61,800 | 41,500 | (32.8%) |

Source: Bureau of Labor Statistics, Non-Farm Employment, U.S. Department of Labor

SCIENTIFIC RESEARCH AND DEVELOPMENT SERVICES

| Region | Number of Employees | | Percent Change |
|----------------------------|---------------------|-----------|----------------|
| | Nov. 2000 | Nov. 2004 | |
| Greater Washington | 40,300 | 47,500 | 17.9% |
| Boston | 24,900 | 28,700 | 15.3% |
| Chicago | 38,400 | 30,700 | (20.1%) |
| Los Angeles | 13,500 | 18,400 | 36.3% |
| San Francisco/ San Jose | 18,800 | 16,600 | (11.7%) |

Source: Bureau of Labor Statistics, Non-Farm Employment, U.S. Department of Labor

The people and their skills are not interchangeable, of course. While the region had the lowest unemployment rate of any major U.S. metropolitan area in 2004, some technology workers still struggle to adjust to changing job requirements.

“There are a lot of telecom workers trying to cross over. There is a significant difference in skill sets between pure IT and telecom. Telecom people struggle to do services; they just know telecom. We deal with data. They deal with moving data.”

— Kenneth R. Bartee, chief executive officer and president, McDonald Bradley

Perceptions of some technology jobs are changing, affecting some students’ job choices, educators and executives say.

“We have students who are employed in various IT fields, but they don’t view their areas as hot. They see security as “hot” so they are coming back to school to get master’s degrees in security... It was not this way five years ago.”

— Dr. Joy R. Hughes,
George Mason University

“People are attracted to our industry and doing things that matter. It attracts a certain kind of person.”

— Todd A. Stottlemyer, chief executive officer,
Apogen Technologies

For government contractors, a major problem is getting new employees through the security clearance gauntlet, which pinches much tighter after the terrorism threat erupted. Despite the recent changes to security clearance policy, executives are still struggling with its inefficiencies. *See footnote on page 30.

“It is a huge problem locally. The result is that companies steal employees from each other and projects are slowed down.”

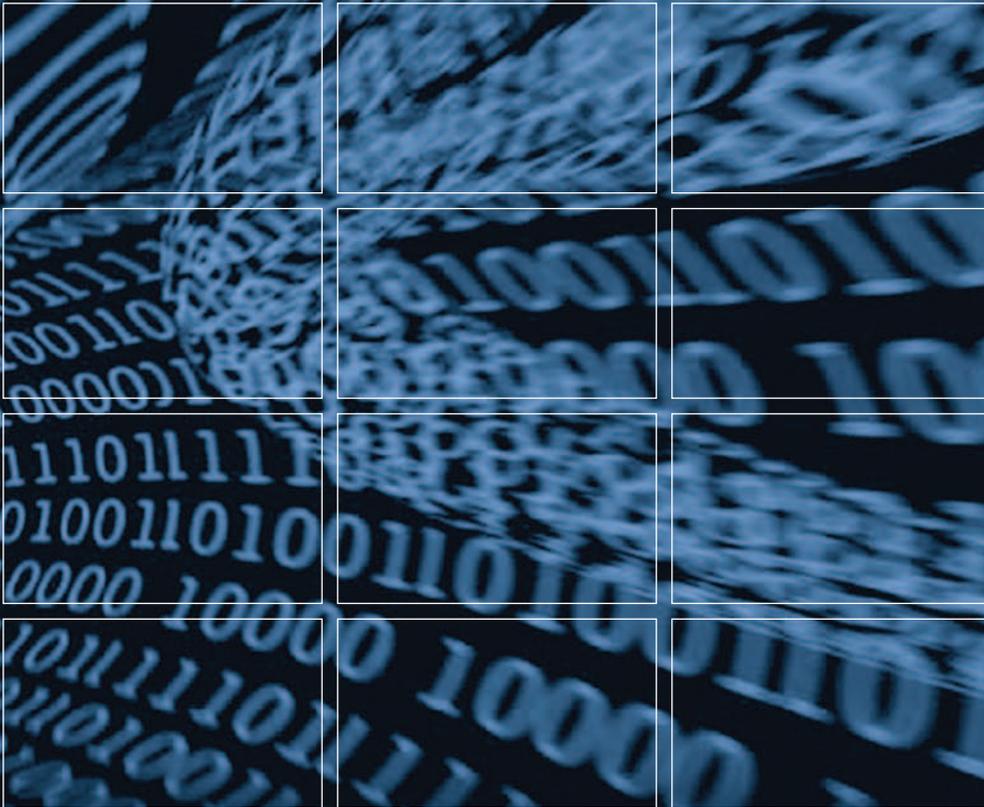
— Harris N. Miller, president,
Information Technology Association of America

“The time to get clearance is 18 to 24 months. This really slows down our work because we can’t get bodies cleared. It’s even tougher because there are fewer kids coming out of schools with IT skills.”

— Kenneth R. Bartee, chief executive officer and president, McDonald Bradley



● TECHNOLOGY CLUSTERS



“ We take existing software and hardware and integrate it... We don't develop chips, but we make sense of them. We will continue to see this grow. ”

— Rodney P. Hunt, president and chief executive officer,
RS Information Systems, Inc.

TECHNOLOGY CLUSTERS

A nuclear scientist describing Greater Washington's technology clusters might choose the analogy of the atom. At the center is an impressive concentration of federal contractors. Layered around it in constant motion are orbiting technologies and new media companies whose futures lie in the region's dynamic commercial markets.

THE FEDERAL CORE

Beginning in the Cold War and continuing through the Vietnam conflict and Gulf wars, the national capital region attracted the largest concentration of defense and security contractors on the planet.

Of the record \$42 billion in federal contracts awarded in the Greater Washington region, an estimated \$26 billion (60%) was for technology services and products produced by companies headquartered in the region, or locally-based federal procurement divisions of other U.S. and foreign firms.

The Mega-Contractors

The federal purchases in the region are dominated by a small number of large firms. These companies compete on so many fronts that no simple tag fits them, but most fall generally into three broad categories:

- >> Defense contractors, including BAE Systems, General Dynamics, Lockheed Martin and Northrop Grumman.
- >> Telecommunications and information technology firms such as MCI, Unisys Corp., Verizon, SAIC, Computer Sciences Corp., Electronic Data Systems Corp., International Business Machines and Perot Systems.
- >> Consulting firms, led by BearingPoint LLC, Booz Allen Hamilton Inc. and Accenture LLP.

In 2003, the top 61 contractors — amounting to less than one percent of Greater Washington's contracting community — took in \$19 billion in contracts awarded in the region, or nearly half of the region's total that year.

The Middle Ground

For a quarter century, the region has spawned government contractors whose close connections with federal agencies and specialized technology skills secured their growth from start-ups to mid-sized firms. Founders of the original group of Capital Beltway contractors took leadership positions in the region, campaigning for state support for education and transportation investments.

Many of the firms — including pioneering local contractors American Management Systems, BDM, BTG Inc. and DynCorp — have been acquired over the years by larger rivals, a process that continues. Many remain, however, as independent companies secured by their inside knowledge of their federal clients' requirements.

Leading government IT and technology product contractors in the region include Anteon International Corp., CACI Inc, GTSI Inc. and Science Applications International Corp.

Niche Specialists

Federal agencies' evolving technology needs created a fertile culture for the birth of small technology contractors. Such firms make up the vast majority of the region's 12,519 federal contractors establishment. Telesis, Preferred Systems Solutions, Catapult Technology and Intellimar are regional firms that made Inc. Magazine's 2004 list of Fastest Growing Companies with annual revenues of at least \$2 million. **Many local firms obtain business opportunities with the government through sub-contractor relationships and partnerships with large prime contractors.**

Many of the small federal contractors were formed to take advantage of federal policies that earmark contracts for minority and women-owned firms. Though such contracting preferences have been politically controversial, they are responsible for giving the Washington region the largest cluster of minority and women-owned technology firms in the United States. In turn, these firms have often been an important source of jobs for minority technology workers.

RS Information Systems, Inc. was created in 1992 as a minority-owned contracting firm under the Small Business Administration's Section 8(a) preference program. The program gave the company space to grow, and in 2004, it had \$315 million in revenue, 1,850 employees (700 in the Washington area) and operations in 43 of the 50 states plus Japan, Korea and Germany. Its business is focused almost entirely on federal agencies, primarily the Defense Department. The company takes software from Oracle, computers from Dell and other suppliers, and adapts these commercial products for federal customers.

Federal contracting rules have prompted partnerships among competitors, including many ties between mega-contractors and niche players. These unions have produced both strains and successful alliances. They contribute to a culture of collaboration that is a particular strength for the region, according to some executives.

"Teaming is one of the strengths of the marketplace," says Jim Duffey, vice president for government global sales and client solutions at Electronic Data Systems. "Companies that learn to work as a team can more successfully interact with customers. In many instances, the federal government requires a certain amount of subcontracting...It started as a requirement. It has gone past that to become a vibrant part of federal contracting."

No exact breakdown exists of the division of Greater Washington technology employees between government contracting and commercial sectors. The George Mason University Center for Regional Analysis estimates that contractors account for 60% of the region's technology workforce, with the remaining 40% working for commercial technology firms or in other technology jobs, according to the analysis.

What is clear from government employment surveys is the size of the region's technology workforce.

CASE STUDY IN TECHNOLOGY COMMERCIALIZATION: APOGEN TECHNOLOGIES

The story of Apogen Technologies, one of the region's fastest growing firms, illustrates a common evolution of technology businesses in the Greater Washington region. It shows, as well, the particular advantages and challenges common to firms that grow up with the federal government as the major client.

Apogen's sales reached \$205 million last year. Among its successes is an answer to the federal government's urgent search for new technology to protect U.S. borders following the Sept. 11, 2001 attacks. Using RFID (radio frequency identification) technology, Apogen devised a system to clear trucks for entry from Canada and Mexico, and sold it to the government.

The company's precursor was a small, woman-owned contracting firm that grew up winning some of its contracts under Small Business Administration preference policies. Its eligibility for preferences expired in 2003, but by then, it had technology and clients to interest outside investors. The original owners were bought out and a new team installed headed by Chairman Philip A. Odeen, a former senior Defense Department official who had built BDM International, a Northern Virginia federal contractor, into a billion-dollar business, and Chief Executive Officer Todd Stottlemeyer, a former senior BDM executive. This team then acquired another federal contractor in January 2004.

More than 90 percent of its sales come from government contracts, but it is also investing in transferring some of its key products from military to commercial use. For example, laser technology that the military uses to spot battlefield land mines from the air has potential for early, non-invasive detection and treatment of certain cancer cells.

How far this commercial technology venture will go isn't clear yet, said Stottlemeyer.

Its success would be a model for the swords-to-plowshares adaptation of government technology to civilian purposes, a persistent goal of planners in the region.

The following tables list the number of employees in key technology occupations, based on Census Bureau/Labor Department surveys of all employers in 2003, whether they create technology or use it in other lines of business.

NUMBER OF EMPLOYEES IN SELECTED TECHNOLOGY OCCUPATIONS

| Computer Systems Analysts | | |
|---|--------------------|--------|
| U.S. | Greater Washington | Rank |
| 474,780 | 36,490 | First |
| Database Administrators | | |
| U.S. | Greater Washington | Rank |
| 100,890 | 11,780 | First |
| Computer Software Engineers | | |
| U.S. | Greater Washington | Rank |
| 392,140 | 22,870 | Second |
| (San Francisco/San Jose: 26,390; ranked first) | | |
| Network and Computer Systems Administrators | | |
| U.S. | Greater Washington | Rank |
| 237,980 | 11,780 | First |
| Network Systems and Data Communications Employees | | |
| U.S. | Greater Washington | Rank |
| 148,030 | 7,950 | First |

Source: Bureau of Labor Statistics, OES, Department of Labor, 2003

The Census and Labor Department surveys permit a ranking of metropolitan regions based on the concentration of employees for each technology job category. The Greater Washington region has a higher percentage of network and computer systems administrators in its workforce than any other leading technology region, including the San Francisco/San Jose area, Atlanta, Boston, Dallas and New York.

COMMERCIAL INDUSTRIES

Telecommunications

The creation of the Internet in the 1960s was the first step in the Washington region's evolution as a center for telecommunications and computer networks. The capital has also pulled in companies that mined the regulatory process to create competitive openings in a telecom market populated by huge local and long distance firms.

The implosion in overbuilt telecommunications and Internet markets in 2000 and 2001 doomed or devalued many of the region's leading firms in this cluster. But industry leaders Verizon, MCI, AT&T, Comcast, Nextel Communications, Sprint, Cable & Wireless and Qwest Communications each employed more than 1,000 employees in 2004, their efforts divided between federal and commercial markets.

Smaller telecommunications firms in the region fought through the collapse and continue to make the region a center of telecommunications innovation. "You've got engineers and people who know how to build those businesses, the capital infrastructure and the lawyers. You have an infrastructure that is conducive to growth," said telecommunications investor Ralph Terkowitz, general partner with ABS Capital Partners.

- >> Corvis Corp. founder David Huber kept his optical switch manufacturing company alive in the downturn by shifting to an entirely new direction. Huber acquired his largest customer, a telecommunications network based in Austin, TX and renamed the company Broadwing Corp. in 2003. Corvis hardware now supports the Broadwing all-digital broadband network linking more than 130 U.S. cities.
- >> iDirect Technologies designs and sells systems for customers seeking satellite broadband connections.
- >> TNS, Inc. operates an international service for handling electronic commerce transactions. Its TransXpress network transmits credit- and debit-card transactions from retailers to card processors, and it also offers anti-fraud and validation services.

- >> NeuStar, spun off from Lockheed Martin, runs the registry of all North American telephone numbers and administers the clearinghouse database carriers used to route billions of telephone calls daily. It has recently moved into the VoIP market for voice communications over data networks.

Other firms found footholds in the rapidly evolving wireless market. InPhonic Inc., which creates and runs Websites that serve wireless telecommunications providers, was the fastest growing firm on the Inc. 500 list in 2004.

Software Developers

The region's commercial software cluster is headed by mid-sized firms with annual revenues between \$50 and \$500 million that offer an array of software solutions for handling communications, data management and strategic issues for both private companies and federal agencies. Some are still fighting back from brushes with disaster in the dot.com bust. All have to define niches where their specialization pays off.

| Computer Programmers | | |
|----------------------|--------------------|-------|
| U.S. | Greater Washington | Rank |
| 431,640 | 23,600 | First |

Source: Bureau of Labor Statistics, OES, Department of Labor, 2003

- >> Manugistics Group Inc.'s custom software helps clients manage product flow from raw material through manufacturing to delivery.
- >> webMethods also tailors software products to make customers' operations run more efficiently, tying together orders, inventory control and shipping.
- >> E Plus develops business process improvements for customers by bundling computer hardware and software from leading vendors with its own software systems.
- >> MicroStrategy Inc.'s expertise is in data mining. Its software searches customers' records for business intelligence, including trends in sales, customer response and fraud detection.
- >> Datatel Inc. software systems handle backbone operations for colleges and universities from finance and student aid to personnel record keeping.
- >> Group 1 (now part of Pitney Bowes) sells tools that verify important information on customers' internal databases and assist with document analysis and data handling.
- >> IMC is a high-level technical consultant, offering assistance on strategic planning, operations management, systems integration and other central tasks.
- >> Conquest Systems software helps clients manage their databases to improve operations and improve control over company networks and internal software systems.

New Media

- >> The rapid rise of AOL in the 1990s, spurred by its chat rooms and unique array of online programs and features, almost single-handedly forced outsiders to rethink the Washington region's image as a government-only technology center. The dot.com bubble briefly put AOL in the driver's seat in its merger with Time Warner. The bubble's burst reversed those positions. But AOL remains a technology innovator across a range of new Web technologies.
- >> Discovery Communications Inc. is a leading member of an influential cluster of documentary and educational program resources based in the Washington region. Combined, producer Ken Burns' creations on PBS, National Geographic and hundreds of independent producers make the capital one of the largest documentary filmmaking center in the country.
- >> Black Entertainment Television, XM Satellite Radio (the fast-growing subscription radio broadcaster serving motorists) and iBiquity Digital Corporation (the pioneer in digital high-definition radio technology) add to the breadth of the region's media cluster, as do the online outlets for *The Washington Post*, *USA Today* and a multitude of specialty publications in the region.

Other Technology Providers

Along with a cluster of biotechnology firms that grew up around the National Institutes of Health and National Cancer Institute, the region also has outposts of commercial technology manufacturing.

- >> Micros Systems Inc. sells touch-screen point-of-sale terminals, reservation systems and other hardware and software to help the hospitality industry analyze sales and track inventory.
- >> Orbital Sciences makes satellites used for communications, remote sensing and scientific purposes. The company also makes the launch vehicles used to deliver satellites into orbit and missiles toward their targets.
- >> Hughes Network Systems provides broadband satellite equipment and network design and operations support.
- >> Micron Technology in Boise, ID purchased a Toshiba semi-conductor facility in Manassas, VA two years ago and has made it the company's most advanced manufacturing center. The company spent \$1.1 billion to buy and upgrade the plant, a big wager for the only U.S. producer of dynamic random access memory chips, but now is preparing to expand production and employment.

Technology Users

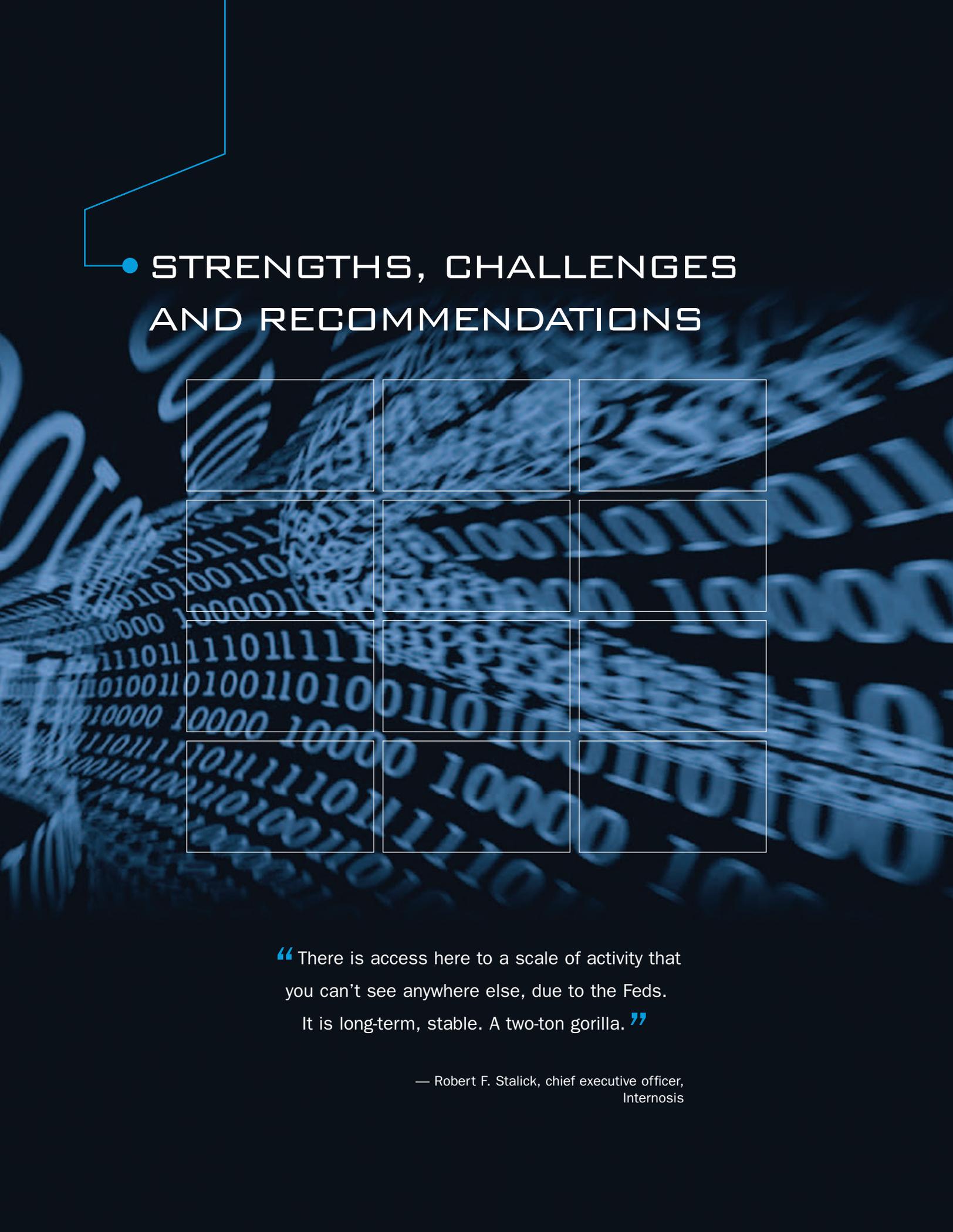
Across the entire region are thousands of companies that don't sell technology, but depend on it to run their businesses, providing markets and employment for the IT industry.

For the past six years, George Mason's IT Engineering department has held an awards banquet to feature outstanding graduates. The tables are purchased by some of the likely suitors for the schools' students, from leading contractor Lockheed Martin to new technology companies like PEC Solutions, Inc. and IMC. The dinner list also includes less obvious sponsors — Geico, the insurance company, and Wachovia Corp., the banker. "They want our students to know that they will hire them too. It's not just the Northrops," says the department's Dean Lloyd Griffiths.

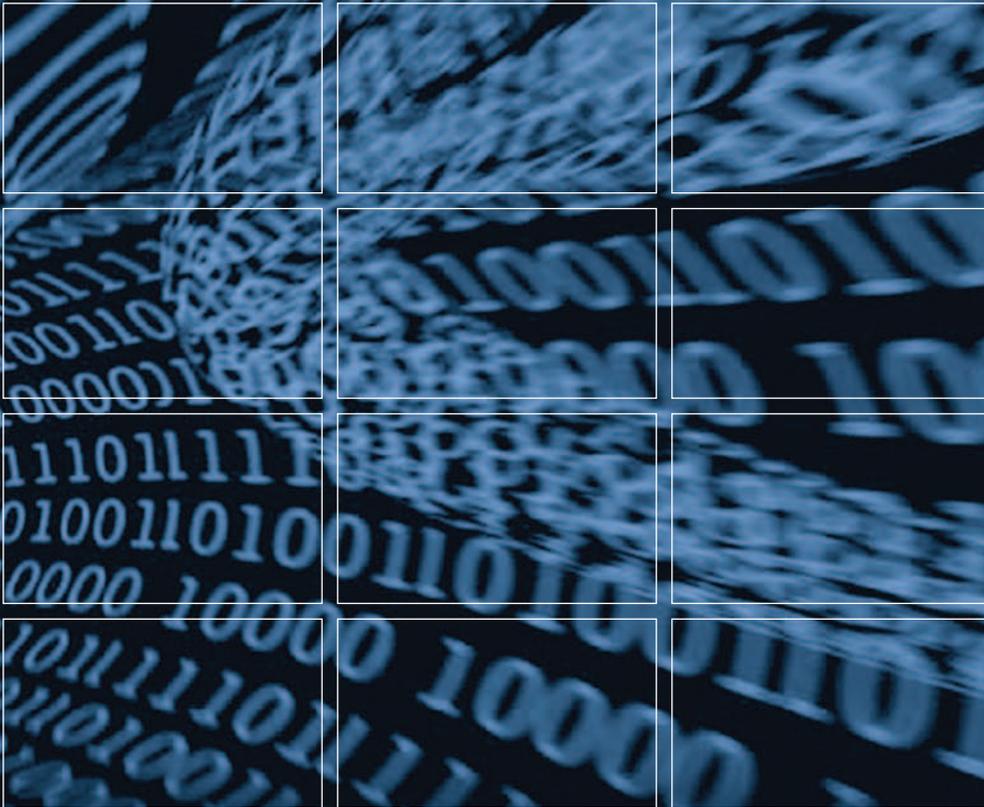
An example is E*Trade, the online trading firm that has expanded into banking, mortgages, consumer finance and international brokerage. The company has used a variety of technologies to lower its break-even point on online trading from 150,000 trades a day two years ago to 45,000 a day, a big gain in efficiency, says Steve Gutterman, executive vice president of E*Trade Financial. More technology will allow customers to make deposits from home. And E*Trade runs its own anti-hacker security team that constantly probes the company's networks for weak points.

“ We have always and will always use technology to create competitive and customer advantage. That is really the core tenet the company was founded on. ”

— Steve Gutterman, executive vice president, retail banking, E*Trade Financial



● STRENGTHS, CHALLENGES AND RECOMMENDATIONS



“ There is access here to a scale of activity that you can’t see anywhere else, due to the Feds. It is long-term, stable. A two-ton gorilla. ”

— Robert F. Stalick, chief executive officer,
Internosis

STRENGTHS, CHALLENGES AND RECOMMENDATIONS

An assessment of the advantages and challenges facing Greater Washington's technology industry starts with the integral presence of the federal government. Participants in the study focused on the region's key strengths as well as concerns associated with its continued growth.

THE LOCATION ADVANTAGE

To compete in the government market and for ease of access to Federal clients, technology companies recognize they must be located in the capital region. The complexity of many of the federal projects — and the risks of super-sized-failures — makes proximity imperative.

Not only has the range of information technology missions continued to expand across the federal government, so has the size and scope of the largest projects. One example is the government-wide telecommunications contract to be issued in 2005 with a potential top value of \$20 billion over a decade. Another is a contract awarded in 2004 to create common software and networking capacity that will link computer systems at Air Force bases globally. Eight firms, from Washington area heavyweights Booz Allen Hamilton Inc. and Lockheed Martin to Multimax Inc. (a technology niche firm in Largo, MD) will compete for \$9 billion in business over the next ten years. **The region's expertise with such vast government projects also creates a potential for providing comprehensive technology solutions to commercial firms in telecommunications, health care management and other sectors.**

“The big trend that is positive [for the region] is e-health information. That is built on networks and software.”

— Scott Cleland, founder,
Precursor, Inc.

It takes years to build a business with the government, according to Dr. David C. Karlgaard, chief executive officer and chairman of PEC Solutions, Inc., a Northern Virginia information technology firm whose annual revenues have grown from \$50 million in 2000 to \$275 million in 2005. “You must know the way government people think and operate. You have to understand budget cycles.”

Nor is there one simple template for penetrating the market.

“Government is not just one customer. It is thousands of customers.”

— John D. Sanders, chairman,
Washington, DC Technology Council, Inc.

Some participants in the survey argue that the region should accept the strong government influence in the technology sector. It has been a powerful plus for the economy and will continue to be.

“We are getting a lot of interest now from firms around the U.S. to partner with us. In 1998, government was considered the wrong place to be. [Now] the IT field is moving to government since business-to-business IT is not growing as fast.”

— Kenneth L. Bartee, chief executive officer
and president, McDonald Bradley

The federal presence is the reality, says Sudhakar V. Shenoy of IMC, Inc., an information technology services firm whose customers include eight of the federal cabinet departments and such commercial clients as Merck & Co., GE Capital and Sara Lee.

“There is a big difference in the type of IT work being done in Washington and Silicon Valley. Silicon Valley is product-oriented IT. They develop off-the-shelf products. Washington is about custom applications development and personal services. Boston is more like Silicon Valley. Chicago is more like Washington... Washington IT will always be about government. Never say ‘never’, but I don’t see it changing. The federal deals are much bigger and commercial business goes up and down.”

— Sudhakar V. Shenoy, chief executive officer, IMC, Inc.

The sheer appeal of the Greater Washington region remains a strength. Education is a major plus — the best public schools are national leaders in advanced placement offering. The federal government’s museums and libraries anchor a region-wide richness in cultural opportunities. One of the largest foreign and minority-group populations in the nation has created diverse communities with unique attractions.

“The social scene is phenomenal. There are sports teams, museums, universities, mountains and the ocean. The airports are accessible with low-cost carriers. We have access to everything. Datatel is happy with Washington.”

— Russ Griffith, president and chief executive officer, Datatel, Inc.

THE CHALLENGES

But the region’s burgeoning growth, keyed so closely to its federal center, has generated its own challenges. Greater Washington is one of the nation’s costliest places to live. Its traffic congestion is among the nation’s worst, and the political divisions between Maryland, Virginia and the District frustrate regional transportation solutions. This combination poses risks to long-term growth, experts warn.

Also, after adding 223,000 net new jobs in the last five years and a population growth of almost 500,000 in the past five years, there now is a debate about how close the region is to a labor shortage that could impinge on the technology industry’s growth.

“As the Washington area’s reputation as a high-cost area grows, and in spite of its corresponding positive reputation as a high amenity, high value-added location, the ability to realize the economy’s inherent growth potentials will diminish... The next threat will be a labor force shortage...that will fuel wage inflation and could counter the area’s other significant advantages that have supported its growth in the past.”

—Stephen S. Fuller, Ph.D., director, Center for Regional Analysis, George Mason University

“We are concerned that the employment market is getting too tight and that people are frustrated by housing prices and traffic.”

— Dendy Young, chairman and chief executive officer, GTSI

Labor and cost issues, however, do not appear critical to others.

Science Applications International Corp. (SAIC), a government contractor with \$8 billion annual revenue, has up to 2,000 job vacancies open at any one time, says chief operating officer Duane P. Andrews. But he says his company (based in Northern Virginia) is not constrained by an unwillingness of technology workers to move to the region. Government clients with top priority projects are still willing to pay a salary premium to have critical work done nearby, officials say.

“Yes, it’s more expensive to operate a software facility here,” says SAIC’s Andrews. His company could cut its operating costs by a factor of five in a less costly area. “I’d love to do the work down in Kentucky, but if the customer wants to get out on the floor, talk to the analyst and look over their shoulder, he’s not going to go down to Kentucky. So we do the work here.” SAIC has concentrated 3,500 employees in the Tysons Corner, VA area, an “edge city” ten miles from the Pentagon. That is as far from one of his major clients as Andrews wants to be.

The answer may well be different for commercial technology firms who answer to markets, not federal procurement requirements.

“Salaries are escalating.
It’s very noticeable.”

— Stephen Swad, executive vice president and chief financial officer, America Online, Inc.

Asked whether the region is too expensive, Swad replies: “I don’t know. We are committed to this area. I have not crossed that bridge. The marketplace will force us to innovate at reasonable costs, or we will fail. There are good alternatives offshore or onshore, inside the states or outside. We will seek them out. Business economics force you there. Our competitors are doing it.”

OTHER ISSUES

Beyond the issues of growth and congestion, the federal presence creates other issues, experts say.

No other national capital, nor any other major metropolitan area, has an economy as concentrated as is Greater Washington’s because of the dominant impact of the federal government.

Commerce in the national capital region has taken the flavor of the federal contracting world. The consequences include a smaller entrepreneurial infrastructure and culture, plus a tendency to put a low priority on commercializing research into new products and services, regional leaders say.

University of Maryland President Dan Mote says, “If they were not totally focused on this (federal) customer, they would probably be looking for ways to participate more in developing a regional culture involving the universities and other kinds of enterprises. It doesn’t exist here at the moment. I haven’t given up on it. But it is a hard nut to crack.”

To address this issue, Mote has helped lead a Greater Washington Board of Trade initiative to increase technology transfer among the area’s universities, federal labs and entrepreneurs.

“For 30 or 40 years we have been one of the top growing regions in the nation... We live what we think, what we see. Getting [a sense of] urgency to deal with this problem is not very easy,” said Roger Stough, associate dean of George Mason University’s School of Public Policy.

“I am an optimist,” added Dr. Alan G. Merten, president of George Mason University. The excesses of the dot.com boom have been buried, replaced by a more serious focus among the region’s technology entrepreneurs. “We are now moving into a phase where companies will be more idea-based and technology-based than before.”

RECOMMENDATIONS

Regional technology leaders interviewed for this project have several recommendations:

1 Continue to press at every level of government for solutions to transportation congestion and bottlenecks.

“The mountains, the city, the arts...there is a lot to be said for the quality of life here.

But still, I can't get to the grocery store because of traffic... We are missing valuable opportunities because we are not willing to get out on the highway. Congestion thwarts networking opportunities.”

— Dr. Joy R. Hughes, vice president for information technology and chief information officer, George Mason University

2 Continue pressure on Congress and the federal government to implement strategies to fix the delay in security clearances. *See footnote on page 30.

Although Congress passed security clearance legislation, experts emphasized the importance of implementing changes.

“The Defense Department relies on a network of investigators that is overloaded, underpaid, understaffed...and we can't seem to get the attention of the senior leaders. A clearance that takes [the Defense Department] eighteen months, NSA [the National Security Agency] can run in 30 to 45 days. There's absolutely no reason for it.”

— Duane P. Andrews, chief operating officer, SAIC

3 Focus IT strategies on other strong parts of the region's economy, such as higher education.

Datatel Inc., a company with \$100 million in annual revenue, creates software systems tailored to college and university needs, running finance, fundraising, student administration and human resource services. Higher education is Greater Washington's third-largest industry, making the region a natural base for the company, says Russ Girffith, Datatel's president and chief executive officer.

4 Turn the region's IT capabilities on emerging opportunities in health care data management.

“We should expand and integrate technology to where the dollars are being spent in vertical markets that are strong here, such as health care, education and leisure, travel and tourism.”

— John Kenny, principal and chief executive officer, Infotech Strategies

5 Continue to seek closer regional cooperation on economic development and quality of life issues.

“We [in the region] are not fully maximizing our assets and strengths because we look at each other as competitors. That river is still big.”

— Todd A. Stottlemyer, chief executive officer,
Apogen Technologies

6 Strengthen the partnerships between technology companies and technology centers at the region’s universities.

“We have to bring in more commercial research dollars, or get a whole lot better at commercializing government research — or both — if we want to really leverage the research for economic benefits.”

— Gerard E. Eldering, director, technology transfer,
MITRE Corp.

Footnote

On Dec. 17, 2004, Security Clearance Reform language contained in the National Intelligence Reform Act of 2004 (S. 2845) was signed into law by President George W. Bush. The legislation includes statutory time requirements on the processing of security clearance applicants. It mandates reciprocity among government agencies, consolidates the background check function into one agency Office of Personnel and Management (OPM) and creates a Security Clearance Czar position to oversee all policies and procedures.

By the end of 2006, OPM must complete 80% of investigations required for security clearances within 90 days; by the end of 2009, OPM must complete 90% of those investigations within 40 days.

Source: Information Technology Association of America

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