



The Telecommunications Industry In Massachusetts:
Employment and Business Landscape

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The Telecommunications Industry in Massachusetts: Employment and Business Landscape



October 2004

Annual report on the Industry's size and scope.

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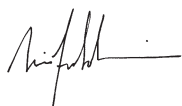
CASTILE
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The Massachusetts telecommunications industry now employs more than 100,000 people in a broad spectrum of services, manufacturing, software and trade companies, and is an important driver of the information economy - both for the region and for the nation. Although the past few years have been challenging, renewed capital spending and strategic investment are now setting the stage for future growth.

In this promising climate, the Massachusetts Telecommunications Council (MTC) is pleased to present two new reports. The first provides a comprehensive review of the composition of our industry today and an understanding of its potential. The second leverages the insights of some of our leading technologists and business strategists to provide an analysis of market and technology drivers. I am sure you will find these reports both stimulating and valuable.

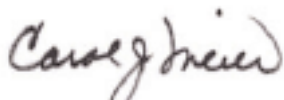
The reports underline the richness of our telecommunications community, with a healthy mix of emerging and established businesses. We continue to believe that innovation and entrepreneurship will be the engines of future growth, with a multitude of vibrant young companies forming and growing, poised to capitalize on market opportunities driven by consumer, business and mobile demand. To succeed and thrive, these new players will benefit from partnerships with larger suppliers and service providers that have the necessary infrastructure, experience and reach, and that bring seasoned and accomplished leaders who are ready and able to support and mentor the upcoming generation. The MTC looks forward to continuing to support our diverse companies in their future success.



Nina Saberi
Chairman of the Board
Massachusetts Telecommunications Council

As part of our ongoing mission, the Massachusetts Telecommunications Council (MTC) provides strategic information on the key technical and business trends that impact all segments of the telecommunications sector, including services, hardware, and software.

Perhaps the most important factors in the ongoing success of the telecommunications industry are the strength and experience of its workforce, and the diverse nature of the companies they support. This report, with comprehensive information on the industry's size, scope, and trends, provides valuable insight to business leaders, policy makers, analysts and the public on the magnitude and successes of the industry in Massachusetts. We look forward to continuing to provide extensive quantitative and qualitative analysis in the future.



Carol J. Meier
Executive Director
Massachusetts Telecommunications Council



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Preface

Since its inception in 1993, the Massachusetts Telecommunications Council has promoted Massachusetts as a global center for telecommunications and networking leadership. Driven by growth in demand for voice, data, and video services, as well as investment in wireless and wireline networks, telecommunications suppliers offering innovative products and services are leveraging the enormous potential of worldwide consumer and business markets.

Today, more than 230 member companies of the Council include communication service providers, product application developers, enterprise IT organizations, industry consultants, and other businesses that support the industry. Educational programs, leadership forums, research, and public policy initiatives are some of the ways the Council supports these member companies.

The Council's research program provides valuable information on the industry to member companies and business leaders, policy makers, analysts, and the public. As part of this research program, the Council conducts an annual survey of employment in the telecommunications industry in Massachusetts. The first survey, conducted in 1993, showed that telecommunications employment stood at 56,411. Today, Massachusetts telecommunications employment is 102,568 and the industry is a fundamental contributor to the business economy of the Commonwealth.

Like most industries, the telecommunications sector has been impacted by the retrenching economy in the state. However, the industry is well poised to be an economic growth engine as the state looks to attract and grow all industries within the Commonwealth. A strong telecommunications infrastructure backbone is key to maintaining and attracting companies. In addition, innovative advances in telecommunications played a large role in driving the growth of all other segments of the information economy in Massachusetts and the nation during the 1990s. They will, no doubt, contribute in important ways to the Commonwealth's future economic growth.

This report describes changes in telecommunications industry employment from 1998 through the second quarter of 2004, based on Dun & Bradstreet data prepared by the University of Massachusetts Donahue Institute. While it is clear that the industry has faced challenging times with employment, several key technologies, and companies offering products based on these technologies, offer reasons to be optimistic¹.



Executive Summary

Massachusetts has long been recognized an incubator for technology innovation and new business start-ups. During the entire life of the technology industry, individuals in Massachusetts have infused the state's economy with the diverse successes that have been nurtured from a single person's idea into successful ventures employing hundreds, and thousands, of people.

A combination of factors has led to these successes: vision, entrepreneurial spirit, expertise and experience, talent and training. This technology tradition in the Commonwealth is alive in the telecommunications industry today, evidenced by a "startup economy", with fully a third of all telecommunications firms in the state having fewer than 50 employees. These new firms, created by business entrepreneurs with fresh ideas, can lead the nation in innovation and overcome the declines of the recession.

This year's survey shows that there is reason for optimism for the telecommunications industry, where companies are investing in new infrastructure as the national economy recovers from the hard-hitting recession. At the end of 2003, investment in IT equipment was on the rise, with orders for computers and electronic products growing, and inventories low. This set the stage for new growth in telecommunications in Massachusetts. Today, jobs nationwide, and in Massachusetts, are returning in certain sectors, and the rate of decline in other sectors has slowed significantly. Businesses and the economy are performing better. Today's Massachusetts telecommunications industry is moving forward and the large declines in the past two years have tapered off.

About the Report

Data for this report was provided by Dun & Bradstreet and was prepared by The University of Massachusetts Donahue in August 2004.

As in previous studies, there are seven segments used to define telecommunications. They are:

- communications services, which includes companies that offer users access to communications;
- communications equipment manufacturing, which includes developers and manufacturers of various routers, and switches, as well as terminal equipment such as telephones, pagers, and communications PDAs;
- telecommunications software, which includes companies that develop software created to manage communications within the network and by computers or other devices connected to the network;
- systems integration, companies who specialize in the integration of hardware, software, human resources, and communications services into networks;
- wholesale and retail trade of communications products; and
- construction related to telecommunications infrastructure.

Major Findings

- There are 102,568 jobs today in telecommunications firms in Massachusetts. This is a decrease of 6.8 percent, or 7,459 jobs from 2003 to 2004, a much smaller decrease than that from 2002 to 2003.
- Massachusetts' share of the nation's telecommunications jobs rose just slightly to 3.1 percent from 3.0 percent in 2003. However, Massachusetts' share of certain segments increased at a higher rate, echoing increases in Massachusetts jobs in these segments.
 - Communications software increased to 7.5 percent share of U.S. jobs in 2004, from 6 percent in 2003.
 - Wholesale trade rose to 3.9 percent share, from 3.5 percent in 2003.
 - Retail trade rose to 2.0 percent share, from 1.6 percent the year before.
 - Construction increased to 1.8 percent share, from 1.6 percent a year earlier.
 - The share of national systems integration jobs in Massachusetts increased from 4.1 percent in 2003 to 4.5 percent in 2004, despite a loss of 735 jobs in that segment in Massachusetts this year.
- Based on PricewaterhouseCoopers Money Tree data, investment in New England Networking and Equipment, Software, and Telecommunications businesses during the first two quarters of 2004 compared with the first half of 2003 is about the same, at just over \$627 million both years. The number of investment deals decreased slightly, from 97 in 2003 to 91 in 2004.
- Employment increased this year in four of the seven telecommunications segments: communications software, wholesale trade, retail trade, and construction.
 - Jobs in communications software increased 14.2 percent, by 2,710.
 - Jobs in wholesale trade increased 8.4 percent, by 842.
- The increase in employment in these four segments was offset by a decline in employment from 2003 to 2004 in communications services, communications equipment manufacturing, and systems integration. Changes in technology, applications, and company operations are factors in employment gains in certain segments and decreases in others.
- Total employment in telecommunications firms in Massachusetts decreased by 6.8 percent, or 7,459 jobs from 2003 to 2004, a much smaller decrease than that from 2002 to 2003, when there was a 17.5 percent decrease, or a loss of 23,359 jobs. The difficult economic environment which affected almost all businesses and individuals across the nation since 2001, but especially technology firms, has stabilized and some businesses are now seeing a return to growth.
- Communications services is still the largest segment of the industry in Massachusetts, with 32,015 people employed today. There are 7,309 more jobs in communications services today than there were in 1998. However, employment decreased by 6,786 in communication services from 2003 to 2004, a much smaller decrease than from 2002 to 2003, when employment in communications services decreased by 10,966. Wireless and wireline service providers are investing in infrastructure more rapidly than in new employment. Because companies have

experienced significant pressure on margins in recent years, these infrastructure investments and productivity improvements are seen as the way that telecommunications firms will be able to offer services at competitive prices.

- Although employment in communications services declined from 2003 to 2004, there were moderate increases in new jobs within certain categories of communications services including cable and other pay television services, and telecom equipment repair.
- Employment in communications equipment manufacturing continues to decline, a trend since 1998, reflecting the ongoing move of manufacturing away from New England, and the shift within the manufacturing category from companies with lower-paid unskilled labor to companies with added-value software jobs. Through technology improvements and productivity gains, manufacturing today is much less labor intensive than in the past, creating this reallocation from low-paying jobs to technology-driven work. This trend is expected to continue, along with shifts of manufacturing to less expensive economies in the U.S. and abroad. These gains in productivity and application of new technologies to the manufacturing process will ultimately accrue benefits to workers, with the future jobs in manufacturing at a higher level requiring trained and skilled workers, and subsequently resulting in improved employment and higher pay.
- The number of telecommunications establishments in Massachusetts decreased just slightly from 2003 to 2004, with 5,939 establishments in the Commonwealth. In 1998, there were only 4,621 establishments in Massachusetts.

The stabilization of telecommunications firms in Massachusetts in 2004 and slowing of employment declines is the foundation upon which a certain cautious new enthusiasm is based. Venture capitalists are putting their trust and money into New England businesses and investors want to fund companies that are well-positioned for growth and success. The telecommunications firms that are operating in Massachusetts today have succeeded through very difficult economic times and are in line to capitalize on a return to financial growth.

New technologies will be the fuel for growth of the telecommunications industry. Some technology areas in particular - broadband, wireless, security, and voice over IP - are examples of how technology innovation drives demand for improved telecommunications devices and services. With carriers investing to make broadband and wireless more available, more affordable, and with a greater variety of services, these technologies are becoming more standard in homes, businesses, and schools, and, in the case of wireless, on the go.

There is renewed interest and an air of optimism in Massachusetts about the future of the telecommunications industry. In the past few months, acquisition activity and increased capital spending by several carriers, substantiate the optimism about the future.



Telecommunications Industry Sectors

Communications Services

Radiotelephone communication
Telephone communication, except radio
Telegraph and other communications
Television broadcasting stations
Cable and other pay television services
Communication services, not elsewhere classified
Telephone services
Telephone set repair
Telecommunications equipment repair
(except telephones)
Communication services
Communications consulting

Communications Equipment Manufacturing

Communication wire
Computer peripheral equipment, nec
Telephone and telegraph apparatus
Radio and t.v. communications equipment
Computer terminals
Communications equipment,
not elsewhere classified

Communications Software

Prepackaged software

Systems Integration

Computer integrated systems design

Wholesale Trade


Cable, wire
Wire and cable
Electronic parts and equipment,
not elsewhere classified

Retail Trade

Telephone & communications equipment

Construction

Communication line and transmission tower
construction
Communications specialization





Introduction

The telecommunications industry in Massachusetts produces a diverse range of products and provides an extensive array of services all of which are directly or indirectly designed to facilitate the exchange of information between people and machines at different locations. Telecommunications products and services support the transfer of information in a variety of forms including voice or audio, images or video, and data—and, frequently, combinations of these forms. Common media for this information exchange include wireline and wireless networks, cable television systems, and the Internet. Communications products and services have a significant impact on nearly every aspect of our everyday lives and have become critical to the efficient functioning of our financial, medical, governmental and educational institutions. For the purposes of this report, the telecommunications industry is defined as including all the companies that play a role in building and maintaining the physical network that allows for information exchange, as well as those firms that provide services that facilitate the use of these networks and are delivered over them.

The diversity of the telecommunications industry extends beyond the range of products and services, however; the companies that make up this industry also serve a broad spectrum of markets that vary significantly in size and scope. Many of the industry's larger firms provide equipment, deliver services, and control and maintain their own network infrastructure. Other firms serve niche markets and provide more customized products and services. Because of the sheer scale and diversity of firms operating in the telecommunications industry in Massachusetts and the speed at which the composition of the industry changes, the development of a comprehensive industry definition requires a careful analysis of the industry's numerous segments.

In an effort to capture the diverse array of firms that provide telecommunications products and services in Massachusetts, this report defines the telecommunications industry in Massachusetts as being composed of firms drawn from 25 standard industrial classifications (SICs)², which are aggregated into seven major industry segments: communications services, communications equipment manufacturing, communications software, systems integration, wholesale trade, retail trade, and construction. The table below lists each of the major segments along with their sectors³.

The primary data source for this report is MarketPlace, a product of D&B Sales & Marketing Solutions. The data are derived from various sources, such as credit reporting data, other public sources of information, and data directly gathered from individual companies. This dataset provides more timely and detailed data on industry employment and establishment growth than that available from public sources⁴.

Changes in Telecommunications Establishments and Employment⁵

In 1993 there were 1,306⁶ business establishments in Massachusetts where people were engaged primarily in telecommunications industry activities. By 1998, the number of telecom-related business sites increased to 4,621. In other words, in just five years, the number of business sites increased by over 254 percent. The number of telecommunication related business establishments continued to grow in the Bay State between 1998 and 2002. There were slight decreases in 2003 and 2004, but this year's figures show that telecommunications industry establishments in Massachusetts are still 29% above where they were in 1998 with a total of 5,939.

Telecommunications Industry Segment	Establishments							% Change
	1998	1999	2000	2001	2002	2003	2004	98 - 04
Communications Services	1,514	1,590	1,721	2,268	2,508	2,384	2,379	57%
Communications Equipment Manufacturing	356	358	343	355	371	344	335	-6%
Communications Software	734	744	792	1,059	1,102	1,038	999	36%
Systems Integration	692	707	725	864	933	910	870	26%
Wholesale Trade	923	856	834	880	878	828	791	-14%
Retail Trade	237	229	240	302	382	384	380	60%
Construction	165	174	176	200	205	193	185	12%
Total	4,621	4,658	4,831	5,928	6,379	6,081	5,939	29%

Employment in the telecommunications sector also experienced strong growth between 1998 and 2002, growing from 94,855 to 133,386. However, between 2002 and 2003 the number of persons employed in the telecommunications industry in Massachusetts fell by 23,359. Between 2003 and 2004, while the industry still experienced losses, the rate has significantly decreased. Total number of jobs lost between 2003 and 2004 was 7,459.

Telecommunications Industry Segment	Employment							% Change
	1998	1999	2000	2001	2002	2003	2004	98 - 04
Communications Services	24,706	29,778	31,846	44,224	49,767	38,801	32,015	30%
Communications Equipment Manufacturing	25,213	25,224	24,880	26,612	25,101	21,086	17,414	-31%
Communications Software	13,370	15,937	16,557	23,298	22,182	19,088	21,798	63%
Systems Integration	17,797	15,186	16,954	18,902	19,017	16,764	16,029	-10%
Wholesale Trade	10,510	9,780	9,791	13,025	12,193	9,995	10,837	3%
Retail Trade	1,865	1,564	1,757	2,237	2,205	1,877	1,992	7%
Construction	1,394	1,615	1,645	2,349	2,921	2,416	2,483	78%
Total	94,855	99,084	103,430	130,647	133,386	110,027	102,568	8%

Communications Services

Communications services firms provide their customers with reliable access to communications network infrastructure and with software and other related products designed to help them use this infrastructure more efficiently. Services provided include local and long distance telephone service (both wireline and wireless), cable television, and Internet access. Communications services firms in Massachusetts include: AT&T, Cingular Wireless, Sprint, and Verizon. In recent years a number of customized services have emerged in response to market demand with diverse applications such as interactive video conferencing, instant stock quotes, and online securities trading. The development of new services has become a competitive imperative for many firms as the competition to provide communications services has heightened dramatically in the last several years .

Communications services is still the largest segment of the industry in Massachusetts, with 32,015 people employed today. There are 7,309 more jobs in communications services today than there were in 1998. However, employment decreased by 6,786 in communication services from 2003 to 2004, a much smaller decrease than from 2002 to 2003, when employment in communications services decreased by 10,966. Wireless and wireline service providers are investing in infrastructure more rapidly than in new employment. Because companies have experienced significant pressure on margins in recent years, these infrastructure investments and productivity improvements are seen as the way that telecommunications firms will be able to offer services at competitive prices.

SIC	Communications Services	1998	1999	2000	2001	2002	2003	2004	98-04
4812	Radiotelephone communication	2,669	2,873	3,338	4,207	5,127	4,839	3,754	41%
4813	Telephone communication, except radio	11,550	13,887	15,671	24,509	27,447	20,360	15,624	35%
4822	Telegraph and other communications	352	672	359	235	333	280	293	-17%
4833	Television broadcasting stations	1,355	1,558	1,667	1,623	1,664	1,516	2,074	53%
4841	Cable and other pay television services	3,681	2,947	3,120	3,713	5,656	3,048	3,072	-17%
4899	Communication services, not elsewhere classified	547	2,123	2,233	2,860	2,783	2,892	1,936	254%
7389.1	Telephone services	3,020	4,041	3,846	4,514	3,924	3,088	3,021	0%
7629.0302	Telephone set repair	81	76	31	100	64	28	28	-65%
7629.9905	Telecom. equipment repair (not phones)	47	46	46	76	82	93	94	100%
8999.0800	Communication services	46	104	183	339	632	539	438	852%
8748.03	Communications Consulting	1,358	1,451	1,352	2,048	2,055	2,118	1,681	24%
	Total	24,706	29,778	31,846	44,224	49,767	38,801	32,015	30%

Communications Equipment Manufacturing

Communications equipment manufacturing firms develop and manufacture various routers and switches, as well as terminal equipment such as telephones, pagers, and communications PDAs. Communications equipment manufacturing firms in Massachusetts include: Cisco, Enterasys, Juniper Networks, Lucent Technologies, and Sonus Networks. Between 1998 and 2004, employment declined from 25,213 to 17,414.

Communications equipment manufacturing's employment decline, a trend since 1998, reflects the ongoing move of manufacturing away from New England, and the shift within the manufacturing category from companies with lower-paid unskilled labor to companies with added-value software jobs. Through technology improvements and productivity gains, manufacturing today is much less labor intensive than in the past, creating this reallocation from low-paying jobs to technology-driven work. This trend is expected to continue, along with shifts of manufacturing to less expensive economies in the U.S. and abroad. These gains in productivity and application of new technologies to the manufacturing process will ultimately accrue benefits to workers, with the future jobs in manufacturing at a higher level requiring trained and skilled workers, and subsequently resulting in improved employment and higher pay.

SIC	Communication Equip. Man.	Employment						% Change	
		1998	1999	2000	2001	2002	2003	2004	98-04
3357.01	Communication Wire	935	764	849	1,366	1,367	1,306	1,202	29%
3577	Computer peripheral equipment, not elsewhere classified	6,811	7,267	7,174	8,631	7,674	7,534	7,790	14%
3661	Telephone and telegraph apparatus	5,393	7,187	6,954	8,162	8,138	5,686	3,701	-31%
3663	Radio and T.V. communications equip	9,003	6,296	6,826	5,706	5,375	4,885	4,013	-55%
3575.0000	Computer terminals	821	747	742	876	964	327	251	-69%
3669.99	Communications equipment, not elsewhere classified	2,250	2,626	2,335	1,871	1,583	1,348	457	-80%
Total		25,213	24,887	24,880	26,612	25,101	21,086	17,414	-31%

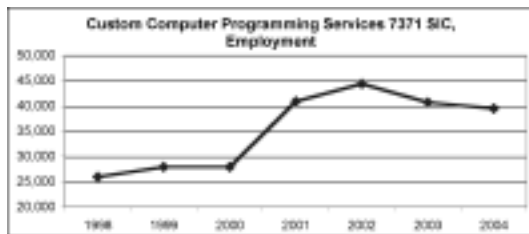
Communications Software

This segment includes companies that develop software created to manage communications within the network and by computers or other devices connected to the network. Examples of communications software firms in Massachusetts include: Chaoticom, Netezza, and Unveil Technologies. The communications software segment of the telecommunications industry has grown considerably over the last five years. Employment in this segment increased from 2003 to 2004 by 2,710 jobs, for a total of 21,798 jobs.

An Emerging Segment of the Telecommunications Industry?

The convergence of the information technology and telecommunications industries is increasingly visible and is reflected in the companies which make up the custom computer programming sector in Massachusetts (SIC 7371). While this industry sector is not included in the definition of the telecommunications industry used in this report, its connection and significance to the industry is growing.

The information technology (IT) industry provides many services, including training software end users and systems administrators, integrated systems design, computer maintenance and repair (including hardware and peripheral installations, upgrades, replacements, and troubleshooting of hardware) and software programming and consulting. Custom programming services (SIC 7371) provides computer programming services on a contract or fee basis; computer design and analysis; modifications of custom software; and training in the use of custom software. In Massachusetts, employment in this sector has increased from 25,982 in 1998 to 39,476 in 2004.



Sitara Networks is but one example of the more than 2,000 Massachusetts business locations that Dun and Bradstreet classifies as part of this sector. Sitara Networks creates software that allows companies to efficiently manage the flow of data over networks, including VOIP, which is relevant to both telecom and non-telecom network managers alike.

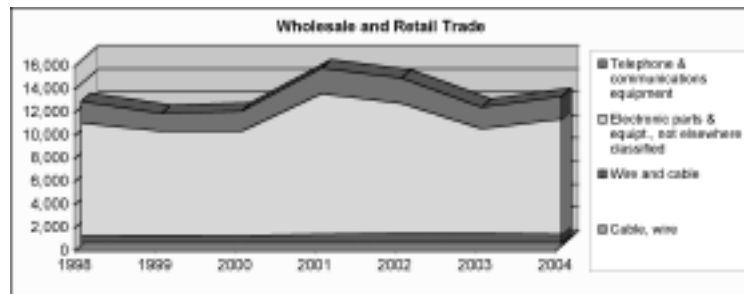
The robust growth of Custom Programming Services in Massachusetts highlights the fact that increasingly computer programmers and software designers are critical elements of both the information technology and telecommunications industries in Massachusetts.

Systems Integration

A number of firms in the telecommunications industry in Massachusetts enable their customers to make the best use of telecommunications equipment software and services by packaging products and services from multiple vendors, and offer specialized training and other services. Known as "systems integrators", these firms provide clients with solutions to myriad challenges confronting firms that operate in a rapidly changing technological environment. There are currently 16,029 people working at 870 establishments in the systems integration segment of the telecommunications industry in Massachusetts.

Wholesale and Retail Trade

Like many other segments in the Massachusetts telecommunications industry, both the wholesale and retail trade of communications equipment and devices enjoyed growth between 1998 and 2002, but experienced employment declines in 2003. In 2004, jobs in wholesale trade increased by 842 for a total of 10,837. Employment in retail trade for 2004 totaled 1,992, a slight increase over 2003.



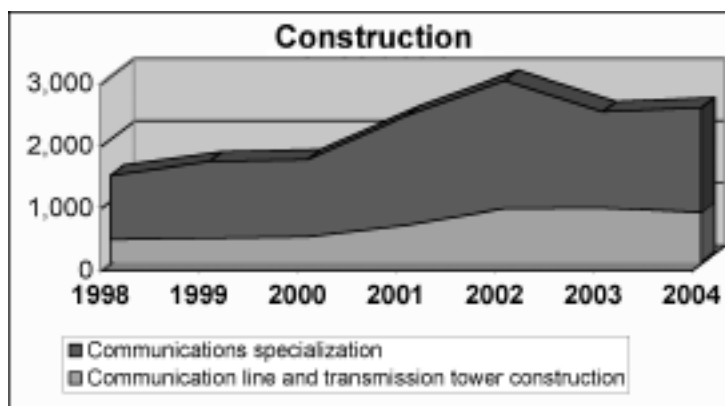
SIC	Wholesale Trade	Employment							% Change 98-04
		1998	1999	2000	2001	2002	2003	2004	
5051.0102	Cable, wire	122	122	119	129	129	121	121	-1%
5063.03	Wire and cable	616	627	608	701	801	797	725	18%
5065	Electronic parts & equipment, not elsewhere classified	9,772	9,031	9,064	12,195	11,263	9,077	9,991	2%
	Sub-total	10,510	9,780	9,791	13,025	12,193	9,995	10,837	3%
	Retail Trade								
5999.06	Telephone & communications equipment	1,865	1,564	1,757	2,237	2,205	1,877	1,992	7%
	Total	12,375	11,344	11,548	15,262	14,398	11,872	12,829	4%

Telecommunications Construction

The final segment of the telecommunications industry in Massachusetts is construction. Firms in this segment of the industry assemble and install the towers and cable required by the networks of telecommunications service providers and other users of telecommunications equipment.

The experience of the construction segment is consistent with what has been seen in the other segments of the industry in Massachusetts. In 1998, 165 establishments employed 1,394 people in this segment. By 2002, 205 establishments employed 2,921 people. But between 2002 and 2003 the number of employees fell by 505 – or 17 percent. In 2004, the number of employees in this sector stood at 2,483, down by just 67 jobs from 2003.

SIC	Construction	1998	1999	2000	2001	2002	2003	2004	98-04
1623.02	Communication line and transmission tower construction	369	387	410	599	862	869	806	118%
1731.03	Communications specialization	1,025	1,228	1,235	1,750	2,059	1,547	1,677	64%
	Total	1,394	1,615	1,645	2,349	2,921	2,416	2,483	78%



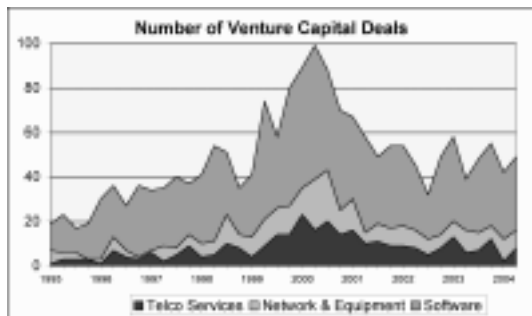
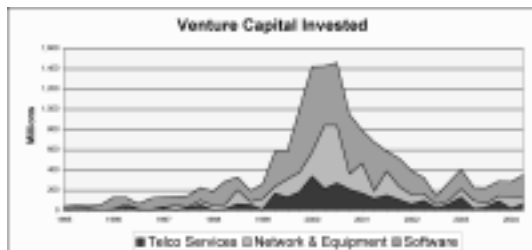
National Standing

A good way to measure the relative performance of the telecommunications industry in Massachusetts is to examine how the telecommunications industry in Massachusetts compares with the larger U.S. industry. Essentially, declines in the telecommunications industry in Massachusetts employment have been in line with those experienced by the industry nationally. From 2003 to 2004 the Commonwealth's share of total national telecommunications employment stayed relatively constant increasing to 3.1%.

Telecommunications Segment	Massachusetts				U.S. Industry				Massachusetts			
	1998	2002	2003	2004	1998	2002	2003	2004	Share 98	Share 02	Share 03	Share 04
Communications Services	24,706	49,767	38,801	32,015	1,374,441	2,246,831	1,942,356	1,760,785	1.8%	2.2%	2.0%	1.8%
Communications Equip. Man.	25,213	25,101	21,086	17,414	513,625	531,353	444,876	389,330	4.9%	4.7%	4.7%	4.5%
Communications Software	13,370	22,182	19,088	21,798	197,739	338,458	317,073	291,389	6.8%	6.6%	6.0%	7.5%
Systems Integration	17,797	19,017	16,764	16,029	282,472	487,488	409,503	359,761	6.3%	3.9%	4.1%	4.5%
Wholesale Trade	10,510	12,193	9,995	10,837	282,750	326,278	285,387	277,878	3.7%	3.7%	3.5%	3.9%
Retail Trade	1,865	2,205	1,877	1,992	77,658	122,771	121,084	100,677	2.4%	1.8%	1.6%	2.0%
Construction	1,394	2,921	2,416	2,483	104,073	159,635	146,636	137,191	1.3%	1.8%	1.6%	1.8%
Total	94,855	133,386	110,027	102,568	2,832,758	4,212,814	3,666,915	3,317,011	3.3%	3.2%	3.0%	3.1%

Recent Trends in New England Venture Capital Funding

Based on PricewaterhouseCoopers Money Tree data, investment in New England Networking and Equipment, Software, and Telecommunications businesses during the first two quarters of 2004 compared with the first half of 2003 is about the same, at just over \$627 million both years. The number of investment deals decreased slightly, from 97 in 2003 to 91 in 2004.



Source: PriceWaterhouseCoopers/Venture Economics/
National Venture Capital Association MoneyTree Survey

Share and Rankings by Segment

Communications services, the largest segment of the telecommunications industry in Massachusetts, reflected the nationwide decline in employment and essentially maintained its share of national employment down slightly from last year, 2.0% to 1.8%. In 1998, Massachusetts was ranked 18th of all states in this segment, its rank went up in 2003 to 16th but it declined in 2004 to 18th of all states.

Equipment manufacturing employment declined in Massachusetts from 2003 to 2004, but its national share stayed fairly level by decreasing .2% in 2004 to 4.5 percent. Massachusetts' rank in this segment in 1998 was number six in the nation, and it is sixth in the nation in 2004.

The Commonwealth's national share of communications software employment has increased from last year. In 2003, Massachusetts had 19,088 jobs and 6.6 percent of the national share, but in 2004, its share of national employment jumped to 7.5%. In terms of 2003 rank, Massachusetts was the third ranked state in this segment and in 2004 it has increased to second.

The state share of the systems integration segment increased in the last year, climbing from 4.1 percent in 2003 to its current share of 4.5 percent. In terms of national rank, the state ranked seventh in 2004 up from eighth in 2003.

Wholesale trade jobs in Massachusetts increased in 2004 from 3.5 to 3.9 percent. In addition, its national standing has increased from eighth to seventh in this segment. The retail trade segment in 2004 found Massachusetts national share increasing from 1.6% in 2003 to 2.0%. More significantly, this segment increased its national ranking from 20th to 16th.

The industry's national share in Communications-related construction increased from 1.6% in 2003 to 1.8% in 2004 while its national ranking stayed flat at 20th.

California, Texas and Florida are the top three ranked states in Retail Trade in 2003. Massachusetts' standing in this segment declined from number twelve of all states in 1998 to number 19 in 2002. The Commonwealth's 2003 ranking in the retail trade segment slipped further to number 20 overall.

Our national ranking also slipped between 2002 and 2003 in Communications-related Construction - from 18th to 20th overall. Texas, California and Florida are the top ranked states in this sector.

Shifts in Business Size

From 1998 to 2002, employment in the Massachusetts telecommunications industry grew steadily in large measure because of the success of smaller firms. In those four years, 80 percent of new job growth occurred in firms with fewer than 250 employees. This represented 30,309 new jobs.

In 2003, firms of all sizes in the Massachusetts telecommunications industry suffered losses in employment, though larger firms seemed to have borne a greater share of the impact. Between 2002 and 2003, telecommunications firms with 1,000 to 4,999 employees lost 55 percent of their workers; slightly smaller firms, those with 250 to 999 employees, lost 10 percent of their workers; and firms with 50 to 249 employees lost 17.5 percent of their workers. Very small firms, those with fewer than 50 employees, performed relatively better, shedding less than 5 percent of their workers in the last year. As a result, very small firms gained a larger share of the Commonwealth's telecommunications employment, increasing from 26 percent to 30 percent in the last year. Meanwhile, firms with 1,000 employees or more experienced a sharp decline in their share of employment. In 2004, the most significant shift in employment among firms of different sizes occurred with a shift from mid-sized telecommunications firms (250 to 999 employees) to larger firms with more than 1000 employees. These larger firms now account for 13 percent of telecommunications employees, up from 7.9 percent last year.



Consolidation among firms has started to occur, with smaller firms being bought by larger companies.

Over the last five years, smaller firms have continued to be the major success story in the Massachusetts telecommunications industry. Between 1998 and 2003, firms with 50 to 249 employees experienced employment increases of nearly 60 percent, while employment in firms with fewer than 50 workers grew 25.2 percent. During this same period very large firms experienced a 53 percent decline in employment.

Telecommunications Employment by Business Size 1998-2004

	1998	2002	2003	2004	New Employment 98-02	New Employment 02-03	New Employment 03-04	New Employment 98-03	New Employment 98-04
1 to 49	26,316	34,555	32,960	31,688	8,239	-1,595	-1,272	6,644	5,372
50 to 249	24,915	48,060	39,644	35,319	23,145	-8,416	-4,325	14,729	10,404
250 to 999	25,124	31,543	28,694	22,042	6,419	-2,849	-6,652	3,570	-3,082
1000 to 4999	18,500	19,228	8,729	13,519	728	-10,499	4,790	-9,771	-4,981
Total	94,855	133,386	110,027	102,568	38,531	-23,359	-7,459	15,172	7,713

Telecommunications Establishments by Size 1998-2004

	1998	2002	2003	2004	New Businesses 98-02	New Businesses 03-04	New Businesses 98-04
Small (1 to 49)	4,289	5,818	5,611	5,516	1,529	-95	1,227
Medium (50 to 250)	260	472	399	363	212	-36	103
Large (More than 250)	72	89	71	60	17	-11	-12
Total	4,621	6,379	6,081	5,939	1,758	-786	674

Endnotes

- 1 *"The Telecommunications Industry in Massachusetts: Market and Technology Drivers for Innovation", a qualitative research report MTC conducted in summer 2004 with industry leaders.
- 2 Beginning with 2003 data, this analysis adds 2 SICs to the earlier definition of the telecommunications sector—communication services (8999.0800) and manufacturing of computer terminals (3575.0000). The practical impact of adding these codes has been modest, as collectively they represent less than 1% of industry employment and establishments.
- 3 The industry definition used in this report is based on the Standard Industrial Classification System (SIC) rather than the new North American Industrial Classification System (NAICS) for two primary reasons. First, NAICS data do not yet allow for a sufficient time series to be developed that would allow the kind of historical analysis contained in this report. Second, public sources of NAICS based data, including data regularly provided by the Massachusetts Department of Employment and Training, are typically released a minimum of six months after being collected and are therefore not timely enough to allow for a detailed analysis of current conditions in this rapidly changing industry. For these reasons, we have turned to private sources of industry data which allow for both a current and historical analysis of the Massachusetts Telecommunications Industry. These private sources have not yet adopted the NAICS approach to industry classification.
- 4 Data from the other sources, such as the ES-202 data from the Department of Employment and Training (DET), are not as current and do not cover small companies with only a few employees. This is a critical factor in the analysis of this industry, as many companies in this sector are partnerships, virtual entities that employ independent agents, and are very small organizations. Dun and Bradstreet data also are more likely to include contract employment that can be missed by the ES-202. This is because contract employees are typically not covered by unemployment insurance.
- 5 All figures in this report are from the second quarter of the given year.
- 6 Telecommunications industry used in "Connection to the Future: An Analysis of the Telecommunications Industry in Massachusetts" by Professor Craig Moore, 1997. This definition does not include the two SICs mentioned in footnote 1, which account for about 1 percent of telecommunications employment in Massachusetts. Thus, these 1993 figures slightly understate the size of the industry as currently defined.

Appendix A: Telecommunications Industry Definition

SIC and NAICS Code Detail

	SIC	NAICS	
I. CONSTRUCTION			
Communication line and transmission tower construction	1623-02	23492	Power and Communication Transmission Line Construction
Communications specialization	1731-03	23531	Electrical Contractors
II. COMMUNICATIONS EQUIPMENT MANUFACTURING			
Communications energy wire	3357-01	335929	Other Communication and Energy
Wire Manufacturing			
Computer Terminals	3575-0000	334113	Computer Terminal Manufacturing
Telephone and Telegraph Apparatus	3661	33421	Telephone Apparatus Manufacturing
Radio & TV communications equipment	3663	33422	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing
Communications Equipment, Not Elsewhere Classified	3669-99	33429	Other Communications Equipment Manufacturing
Computer Peripheral Equipment, Not Elsewhere Classified	3577	334418	Printed Circuit Assembly (Electronic Assembly) Manufacturing
		334613	Magnetic and Optical Recording Media Manufacturing
		334119	Other Computer Peripheral Equipment Manufacturing
III. COMMUNICATIONS SERVICES			
Radio Communications, Not Elsewhere Classified	4812	51333	Telecommunications Resellers
Telephone Communications, Except Radio telephone	4813	51331	Wired Telecommunications Carriers
		51333	Telecommunications Resellers Satellite
		51334	Telecommunications
Telegraph & other communications	4822	51331	Wired Telecommunications Carriers
Television Broadcasting Stations	4833	51312	Television Broadcasting
Cable and Other Pay Television Services	4841	51321	Cable Networks
		51322	Cable and Other Program
Distribution			
Communications Services, Not Elsewhere Classified	4899	51339	Other Telecommunications
		51334	Satellite Telecommunications
		513322	Cellular and Other Wireless Telecommunications

Telephone services, answering services, telemarketing, etc	7389-10	561499	All Other Business Support Services
		561421	Telephone Answering Services
		561422	Telemarketing Bureaus
Telecommunication equipment repair (except telephones)	7629-9905	811212	Computer and Office Machine Repair and Maintenance
Telephone set repair	7629-0302	811213	Communication Equipment Repair and Maintenance
Communications consulting	8748-03	541618	Other Management Consulting Services
Communication services	8999-0800	54169	Other Scientific and Technical Consulting Services
		514199	All Other Information
Services (pt)			
IV. WHOLESALE TRADE			
Cable, wire	5051-0102	42151	Metals Service Centers and Offices
Wire and cable	5063-03	42161	Electrical Apparatus and Equipment, Wiring Supplies, and Construction Material Wholesalers
Electronic Parts and Equipment, Not Elsewhere Classified	5065	42169	Other Electronic Parts and Equipment Wholesalers
V. RETAIL TRADE			
Telephone and communication equipment	5999-06	443112	Radio, Television, and Other Electronics Stores
VI. COMMUNICATION SOFTWARE			
Prepackaged Software	7372	51121	Software Publishers
		334611	Software Reproducing
VII. SYSTEMS INTEGRATION			
Computer Integrated Systems Design	7373	541512	Computer Systems Design Services

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Castile Ventures
890 Winter Street, Suite 140
Waltham, MA 02451
T: 781-890-0060  F: 781-890-0065
www.castileventures.com