

Merrimack Valley Workforce Investment Board
Labor Force Blueprint

by O. Steven Quimby, Director of Planning and
Policy Research



October 2003

Funding for this study was provided by the Massachusetts
Workforce Training Fund

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Greetings:

On behalf of the Merrimack Valley Workforce Investment Board, I am pleased to present the Labor Force Blueprint.

The publication of the Blueprint could not come at a better time for the Valley. After over two years of job loss and upheaval in the region, a number of recent developments have left us with hope that new jobs will be created in the Valley.

No longer is economic development just about real estate and roads. A prepared workforce is a key competitive advantage for the region and is central to our ability to attract, retain and support companies that do business in the region.

The MVWIB is charged under the Workforce Investment Act with overseeing the workforce development system and investing the region's federal workforce funds. The Blueprint will provide accurate labor market information to all its partners in the workforce development system.

However, the publication of the Blueprint is only the beginning. Any report is only worthwhile if it is used. To that end, the Merrimack Valley Workforce Investment Board will drive an effort to make the Labor Force Blueprint the coordinating document for workforce development in the region.

It will require a region-wide effort among all the partners in the workforce system to rethink how we invest our resources, to work together to bring in more funds to support our efforts, and ensure that we are establishing accountability for the system.

Business, government, and community leaders from all over the Valley and the state were generous with their time and insights during the development of this blueprint. The MVWIB is grateful to them for their commitment to making the Merrimack Valley a better place to live and work.

Sincerely,



Shaw Rosen
Executive Director
Merrimack Valley Workforce Investment Board

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Executive Summary

The Merrimack Valley Workforce Investment Board (MVWIB) is charged with conducting research and disseminating information on the labor force in the region. This Blueprint is designed to assist the MVWIB and other members of the regional training system in understanding the regional labor market and to identify opportunities for workers in the region to make connections with the needs of businesses in regionally important industries. It will also assist the MVWIB in setting priorities and making policy decisions around the use of job training funds in the region. The Blueprint is also designed to be a document that will help to partner the workforce development system with the needs of economic development in the region.

The Blueprint provides information on the three critical components of the regional workforce development system:

- Labor Market Supply: the skills and capacity of the region's workforce, with particular emphasis on niches of workers that provide economic development opportunities for the region or that have particular service needs to obtain employment.
- Labor Market Demand: businesses in the critical and emerging industries in the region drive the demand for labor. The Blueprint looks at their human resources needs, projected demand for labor in the future, and the opportunities for advancement to jobs that pay wages at or above the Self-Sufficiency Standard, a more accurate measure of the true costs of raising a family in the region than traditional poverty measures.
- The Regional Training System: training providers and intermediaries in the region. The Blueprint examines the extent to which their services meet the needs of residents of the Merrimack Valley and businesses in the critical and emerging industries.

LABOR MARKET SUPPLY

The population of the Merrimack Valley has grown at nearly twice the rate of the population of Massachusetts as a whole. Between 1990 and 2000, the population of the Merrimack Valley grew 10.5%, while Massachusetts grew only 5.5%. The labor force of the region also grew quite quickly. Interestingly, the Merrimack Valley region is a net exporter of workers, with over 12,000 more employed workers in the region than jobs.

The population of the region is also growing more diverse. One of every 8 Latinos in Massachusetts lives in the Merrimack Valley. In Lawrence, Latinos comprise nearly 60% of the city's population in 2000 according to the US Census Bureau.¹ The Latino population is also the fastest growing component of region's population. Without the dramatic growth in the Latino population, the city of Lawrence would have actually lost residents between 1990 and 2000.

Educationally, the Merrimack Valley has significant numbers of residents with both very high and low levels of education. Education levels in the region differ by municipality of residence and by race and ethnicity. A significant challenge for the region is the large number of people for whom poor English speaking skills are a problem. In the city of Lawrence, for example, over 20% of residents over the age of 14 had poor English speaking skills according to the US Census.

The Merrimack Valley region traditionally has one of the highest unemployment rates in the state and the city of Lawrence has ranked first or second in unemployment in Massachusetts for many years. As of August, 2003, the region has an official unemployment rate of 8.3% and Lawrence has an unemployment rate of 14.6%. These measures are both dramatically higher than the Massachusetts' rate of 5.6%.

The Merrimack Valley has three niche markets of workers that the workforce devel-

opment system must pay particular attention to.

- The region has a large group of highly educated professionals, many of whom have been affected by the recent economic downturn in ways that they have never been affected before. Some of the jobs previously held by members of this portion of the region's population will not be coming back even when the economy rebounds. Therefore, training opportunities will have to be developed to assist these workers in transitioning to the different opportunities that a rebounding economy will undoubtedly present.
- The region also has many highly skilled manufacturing and production workers who have been displaced from Lucent Technologies and other high-tech manufacturers in the region. These workers represent a significant economic development asset for the region that could be sold to companies in biotechnology, manufacturing, and other growing industries. Many of these people received frequent company-sponsored training and so could be ready to access new employment opportunities with limited occupational and technical skills training.
- Finally, the Merrimack Valley has a pool of lower-skilled workers. Many of these people have work experience, sometimes for a number of years, but were displaced in the recent economic downturn. These workers may be attractive to specific industries with requirements for a large amount of lower-skilled labor.

LABOR MARKET DEMAND

Labor market demand in the Merrimack Valley is driven by businesses in a group of critical and emerging industries. The MVWIB's Blueprint Committee selected four critical industries, Health Care, Construction, Communication, and Manufacturing, and three emerging industries, Food Products, Medical Instruments and Supplies Manufacturing, and Trucking and Warehousing. Criteria for the selection of critical industries were volume of employment over the past ten years, stability, a significant proportion of jobs requiring less than a bachelor's degree, and offering strong career ladders and self-sufficiency wage potential. The emerging industries were selected on slightly different criteria: employment of at least 1,000 workers in the region, rapid employment growth over the past five years, and building on existing labor force and economic development assets of the region.

The Blueprint research process included looking at quantitative data about the critical and emerging industries and conducting interviews with businesses in each industry. The general findings for each critical and emerging industry were:

- The major finding for **Health Care** is that, on an "apples-to-apples" basis, it is the largest employer in the region. Furthermore, Health Care employment is growing while employment in manufacturing is declining in the region. Health care firms identified a number of career ladders leading to occupations in which there is high demand and strong wages. Skilled jobs such as radiology, MRI, and mammography technicians were in high demand.
- In **Construction**, there are number of good jobs and career ladders opportunities. Employment in the trades represents one of the best opportunities for workers with less than a Bachelor's degree to obtain self-sufficiency wage employment. However, employment in the Construction industry in the Merrimack Valley trails that of the state as a whole. As the Construction workforce ages, there will be a number of opportunities for workers to enter the industry.
- The **Communications** industry is a strong employer in the region and has a large number of jobs with high wages and technical skills requirements. Businesses in the industry cite a lack of technical skills in the workforce and the lack of qualified technical skills training providers in the region as barriers to employing more of the region's residents.
- The **Manufacturing** industry has declined dramatically in the region, but there are still sectors of the manufacturing industry that are growing. These sectors are in

the more technically-skilled areas of manufacturing, which gives the region a competitive advantage due to the highly skilled nature of the labor force. Furthermore, there is evidence that employment is starting to come back in some sectors of manufacturing in the region.

- The **Food Products** industry has a cluster in Haverhill and other parts of the region that is attracting new companies to the region and increasing employment. This industry is a strong benefit to the region because their employment profile includes a large number of lower-skilled workers that presents an opportunity for workers who have been displaced from lower-level manufacturing and assembly jobs.
- The **Medical Instruments and Supplies Manufacturing** industry has the potential to grow significantly due to the presence of industry leaders in the Valley. In the future, the critical step will be for the region to retain the manufacturing jobs these companies will create as they put more products onto the market.
- The **Trucking and Warehousing** industry employs a large and growing number of workers in the Merrimack Valley and surrounding area, yet the industry faces an image problem. Many people do not realize the volume of technically skilled jobs that are available in the industry. Also, the industry's tradition of promotion from within and willingness to provide tuition provide career ladders opportunities for workers in the region to advance.

Businesses in the critical and emerging industries identified a set of five overarching human resource issues that the MVWIB should address. The issues and recommendations from the Blueprint are:

1. The aging workforce: A number of critical and emerging industries noted that significant portions of their workforce were aging and that replacement workers were not readily forthcoming.

Recommendation: The Merrimack Valley Workforce Investment Board (MVWIB) should promote knowledge of the employment opportunities and education and skills requirements in the critical and emerging industries to a wide constituency, particularly youth.

2. A redefinition of basic skills: The basic requirements for entry level jobs have risen dramatically over the past ten years. Candidates for entry level employment are generally expected to have excellent verbal and written skills, basic mathematics education, and a broad array of soft skills, including teamwork, communication, positive work ethic, and ability to accept supervision.

Recommendation: The MVWIB should ensure that basic skills form the foundation of training and educational efforts in the region, from high school to community colleges to occupational skills training and that soft skills are included as part of the curriculum in all training efforts in the region.

3. Lack of appropriate occupational skills training and certification programs: There are currently gaps in the region's offerings for occupational skills training to meet the needs of several critical and emerging industries.

Recommendation: Training providers and the MVWIB should use the information provided in the Blueprint to develop and enhance their programs in ways that meet the needs of critical and emerging industries. Specifically, more programs are needed to meet the needs of the Trucking and Warehousing, Manufacturing, and Communications industries.

4. Image problems: Several critical and emerging industries are hampered in their efforts to recruit workers by an outdated public perception of their industry. The rapidity of technological change in industries such as Manufacturing and Trucking and Warehousing has led to outmoded views of the occupational structure and employment needs of the industry.

Recommendation: Using the Blueprint as a tool, the MVWIB and industry partners should aggressively promote the opportunities present in each of the critical and emerging industries to the widest possible audience.

5. Insufficient career ladder opportunities: Several critical and emerging industries appear to have too few jobs available at the middle level to support career ladders programs.

Recommendation: The MVWIB and training providers should work closely with individual businesses to identify opportunities for sector initiatives to bridge the gap from entry-level employment to jobs that pay self-sufficiency wages

THE REGIONAL TRAINING SYSTEM

The Merrimack Valley region has a wide ranging training system that includes institutions of higher education, vocational school, and community-based education and occupational skills training programs. A significant amount of training is provided by these organizations in areas including English for Speakers of Other Languages (ESOL), Adult Basic Education (ABE), and occupational skills training.

Gaps exist between the capacities of the current occupational skills training providers and the needs of the region's residents. Access to occupational skills training for residents without strong English speaking skills is limited. Some providers do combine ESOL and occupational skills training but many do not, leaving residents with low levels of English speaking skills competing for limited spaces in ESOL programs and locked out of employment opportunities leading to jobs that pay self-sufficiency wages. Over the past two years, several training organizations have begun to provide training services to people with limited English-speaking skills through the region's Individual Training Account (ITA) system. However, the need for such training continues to exceed the supply by wide margins, so the addition of additional capacity and capabilities in this area is recommended.

This report also documents significant gaps between the needs of businesses in the critical and emerging industries and the current capabilities of the regional training system. Many training programs have not closely engaged businesses in the critical and emerging industries. The MVWIB should ensure that all training providers in the region have close connections with businesses in the industries where they intend to place people from their programs. Businesses must be involved in identifying training needs, developing curriculum, and evaluating the ongoing success of the program. Training providers should request the involved businesses to make commitments to provide internships and interview candidates who successfully complete the training program to ensure that the needs of both businesses and residents are well met.

GENERAL RECOMMENDATIONS

In addition to the industry-specific recommendations, a number of more general issues that bring together the needs of residents of the region, the regional training system, and businesses in the critical and emerging industries have been developed. These are:

- Align workforce development funding options with the needs of economic development and bring additional, flexible resources, including public and private sector funds, into the region to support economic development.
- Ensure that workforce development has a seat at the table when economic development decisions are being made to ensure that the system is able to respond to the needs of businesses in the critical and emerging industries in the region and also to the needs of the region's workforce.
- Currently there are a number of training options serving the Health Care and, to a lesser extent, Manufacturing industries in the region, but the other critical and

emerging industries are underserved. The MVWIB and its industry groups should drive the development and implementation of training programs in each of the critical and emerging industries.

- Many businesses indicated that they are worried about the quality of future worker being produced by the public schools. The MVWIB should partner its industry groups with educational efforts to ensure that business needs for worker skills are being met.
- The MVWIB should work with its training partners to ensure that additional Adult Basic Education and English for Speakers of Other Languages training is provided to more people in the region and to ensure that such training is contextualized to meet the real needs of both businesses and residents of the region.
- The workforce of the Merrimack Valley is highly skilled, with many technical, professional, and managerial workers. This is a valuable asset that economic development directors and planners in the region's municipalities can sell to businesses considering locating in the region. Provide regular and on-demand information on the users of the Valleyworks Career Center to support economic development efforts.
- Develop an enhanced higher education presence in the Merrimack Valley, particularly for Bachelor's and Master's degree granting institutions that serve the needs of the critical and emerging industries.
- Convene industry working groups of Merrimack Valley businesses in each of the critical and emerging industries to ensure that the MVWIB and its programs are able to respond quickly to industry needs.
- Work closely with employers in the critical and emerging industries to develop and fund training for incumbent workers in the skill areas that meet business needs and support career advancement and wage gains for workers.
- The biggest gap in funding is for incumbent workers. The Massachusetts Workforce Training Fund has been beneficial to a number of regional companies, but the amount of money available cannot meet the need for incumbent worker training. The MVWIB should work with employers to facilitate bringing in outside resources and demonstrating the bottom-line effectiveness of training for incumbent workers at all levels.
- Agility of funding sources is critical to the success of the workforce development system. As a new 501(c) 3 nonprofit organization, the MVWIB should aggressively seek out private sources of workforce development funds to conduct pilot projects that can test some of the solutions proposed in this Blueprint.

ENDNOTES

- 1 The US Census is widely believed to undercount Latinos and other racial and ethnic minorities, making it likely that the Latino percentage of residents of Lawrence and the Merrimack Valley region is higher than stated.

Chapter 1. Introduction



The Merrimack Valley Workforce Investment Board (MVWIB) is one of sixteen regional entities in the Commonwealth of Massachusetts charged with the oversight and coordination of the expenditure of federal funding for workforce development. Workforce Investment Boards (WIBs) are private-sector

led organizations that work in partnership with the Chief Elected Official in the region. The Chief Elected Official of the MVWIB is the Mayor of the City of Lawrence, Michael Sullivan.

The MVWIB serves a region that includes fifteen municipalities.¹ (See Figure 1.1)

Members of the MVWIB represent the geographic diversity of the region, as well as a diverse range of professional affiliations, including large and small private businesses, educational institutions, and city and state government agencies.

One of the primary functions of the MVWIB is to ensure that expenditures on job training programs meet the needs of both residents of the region and the region's employers by providing accurate labor market information. As one part of this effort, the MVWIB obtained funding from the Commonwealth of Massachusetts Workforce Training Fund to research the critical and emerging industries in the Merrimack Valley and their employment needs. The overarching goal of this research is to provide better information on what the real needs of employers in important regional industries are to the workforce development system and to residents of the Merrimack Valley. We also want to be able to provide information to employers on the qualifications of the regional workforce and to provide information on the availability of the regional training system to meet their needs.

To guide the labor force blueprint research, Joseph J. Bevilacqua, Chairman of the Merrimack Valley Workforce Investment Board, appointed an ad hoc committee of employers, real estate developers, and economic development planners to oversee this effort. The first task of the committee was the selection of the critical and emerging industries that are the subject of the research for the blueprint.

Following the selection of industries, the committee guided the research through assistance with access to employers, reviewing the findings as they came in, and assisting with preparation of the roll-out plan for the Blueprint.

FIGURE 1.1 MUNICIPALITIES IN THE LOWER MERRIMACK VALLEY WORKFORCE INVESTMENT AREA

| | |
|------------|---------------|
| Amesbury | Methuen |
| Andover | Newbury |
| Boxford | Newburyport |
| Georgetown | North Andover |
| Groveland | Rowley |
| Haverhill | Salisbury |
| Lawrence | West Newbury |
| Merrimac | |

FIGURE 1.2 CRITICAL AND EMERGING INDUSTRIES IN THE MERRIMACK VALLEY

| Critical Industries | Emerging Industries |
|---------------------|--------------------------|
| Communication | Food Products |
| Construction | Medical |
| Health Care | Instruments and Supplies |
| Manufacturing | Manufacturing |
| | Trucking and Warehousing |

PURPOSE OF THE BLUEPRINT

The purpose of the MVWIB Labor Force Blueprint is two-fold. First, it is designed to allow the MVWIB to make informed decisions about the best possible investments to make in workforce development. In particular, the MVWIB wants to know which industries and sectors are critical and emerging in the region and what their workforce needs are now and what they are projected to be five to ten years down the road.

The second purpose of the Labor Force Blueprint is to inform community residents, secondary schools, institutions of higher education, training providers, and community and faith-based organizations about the employment picture in the region. Specifically, we want to inform them about which industries are critical and which are emerging in the region. Then we want to inform their practice in the development and implementation of training programs for these industries by putting out information from employers on what the critical skill deficits are that prevent workers from being hired or from advancing, what are the possibilities for career ladder development within each industry, and what are the projected hiring needs of employers in the Merrimack Valley region over the next five to ten years.

It is equally important that we make the distinction here as to what the MVWIB Labor Force Blueprint is not. The blueprint is not the definitive determination of what industries are and are not critical to the region. The fact that an industry is not included in the blueprint does not mean that it does not employ large numbers of people in the region, that it does not offer opportunities for Merrimack Valley

residents or that it may not emerge to become a critical industry in the region in the future. To the last point, in fact it would be startling if all of the three emerging industries, and no others, grew to become critical industries in the region in the future. Experience teaches that even the best analysts have had murky crystal balls when trying to determine what will become the next big thing in a region and the researchers involved with this study claim no better eye into the future than their predecessors. The selection of industries as critical and emerging represents the best, data-driven selections that can be made based on current realities and the most up to date data. As realities change, it will be very important for the MVWIB and its partners to continually update the information in Blueprint so that it reflects the real-time employment situation in the region.

PARTNERSHIPS

In the development of the Blueprint, the MVWIB has partnered with several organizations who have contributed significantly to its development.

- **The Merrimack Valley Planning Commission** provided Census data for the region and research assistance on the Blueprint. The Commission, in turn, will utilize the workforce development data in the Blueprint as part of its Community Economic Development Strategies (CEDS) report. This effort is part of a larger effort in the region to effectively link workforce development and economic development.
- **The United Way of Merrimack Valley** will use the information from the Blueprint to inform its funding efforts that support education and workforce development in the region.
- **The Chambers of Commerce** in the region, including the Merrimack Valley Chamber of Commerce, the Haverhill Chamber of Commerce, the Salisbury Chamber of Commerce and the Newburyport Chamber of Commerce have contributed to the development of the blueprint through encouraging their members to participate in the employer surveys and through providing leadership to the work through participation on the Blueprint Committee and the MVWIB Executive Committee.
- **Northern Essex Community College** has partnered with the MVWIB in the development of the framework for the Blueprint. Northern Essex will utilize the Blueprint to help guide the efforts of the Occupational Advisory Board to focus its workforce development training efforts on the needs of critical and emerging industries in the region.

FIGURE 1.3 WORKFORCE DEVELOPMENT PYRAMID



The MVWIB, as part of its effort to make the Blueprint a useful coordinating document for workforce and economic development efforts in the Merrimack Valley, will be actively seeking out additional partnerships with economic development, workforce development, and educational organizations in the region.

OVERVIEW

This report seeks to make a connection between the three critical components of the workforce development system: the regional labor force, the demand side of employer needs, and the capacity of the regional training system.

The remainder of this report proceeds as follows. Following a brief chapter describing the methodology used in undertaking the research for this report, we report on the demographics of the Merrimack Valley regional workforce, with particular attention paid to the education and skills that residents bring to employers. In addition to the overview of the regional labor market, we also provide in-depth information on two critical niches of the labor market: displaced manufacturing workers and recent immigrants. The following two chapters focus on the critical industries of the region: Health Care, Construction, Communications, and Manufacturing. For each industry, the report provides information from employer interviews that identify critical skills

and credentials for the industry, career pathways, and opportunities for employment training programs to meet employer needs. A similar analysis for the three emerging industries, Food Products, Medical Instruments and Supplies, and Trucking and Warehousing, follows. An analysis of the current capacity of the region's training system provides the third leg of the tripod. The next two chapters provide detailed analysis of how the three components of the regional labor market, worker supply, employer demand, and training system support, fit together. The report identifies unmet employer and worker needs and provides recommendations for policy and practice to better meet the needs of both groups. The report concludes with brief descriptions of four industries that are on our "watch list." These industries did not fully meet the criteria established for critical and emerging industries at the time these selections were made, but they may well continue to grow into important industries in the future.

Chapter 2. Methodology

FIGURE 2.1 INDUSTRIES EMPLOYING MORE THAN 1,000 WORKERS IN THE MERRIMACK VALLEY REGION: 2001

| SIC Code | Name | 2001 Employment |
|----------|---|-----------------|
| 80 | Health Services | 13,291 |
| 36 | Electronic and Other Electric Equipment | 11,117 |
| 73 | Business Services | 9,992 |
| 58 | Eating and Drinking Establishments | 7,545 |
| 87 | Engineering and Management Services | 4,557 |
| 54 | Food Stores | 4,477 |
| 38 | Instruments and Related Products | 4,258 |
| 83 | Social Services | 4,233 |
| 17 | Special Trades Contractors | 4,168 |
| 50 | Wholesale Trade-Durable | 3,571 |
| 51 | Wholesale Trade-Non Durable | 2,900 |
| 35 | Industrial Machinery and Equipment | 2,634 |
| 30 | Rubber and Misc. Plastics Products | 2,521 |
| 59 | Miscellaneous Retail | 2,314 |
| 48 | Communications | 2,094 |
| 82 | Educational Services | 1,959 |
| 34 | Fabricated Metal Products | 1,938 |
| 55 | Automotive Dealers and Service Stations | 1,857 |
| 27 | Printing and Publishing | 1,832 |
| 60 | Depository Institutions | 1,777 |
| 79 | Amusement and Recreation Services | 1,695 |
| 20 | Food and Kindred Products | 1,555 |
| 28 | Chemicals and Allied Products | 1,355 |
| 26 | Paper and Allied Products | 1,296 |
| 86 | Membership Organizations | 1,222 |
| 42 | Trucking and Warehousing | 1,105 |

Source: Massachusetts Division of Employment Training ES-202 data.



critical issue for researchers in the workforce development field, as in many areas of social sciences, is the lack of timely data in the area of interest that is comparable across a number of sources. The Merrimack Valley Workforce Investment Board (MVWIB) Labor Force Blueprint is the result of pulling together secondary data from a number of sources and combining that data with data from interviews with employers in the region. Issues with the various sources of secondary data may impact the validity and reliability of certain areas of this report. In this chapter, processes used for obtaining and analyzing the data for the report are described, the data sources for the various components of the Blueprint are listed, and the issues that may affect the validity and reliability of the study are discussed.

LABOR SUPPLY

The primary source for data on regional residents is Census 2000 data, which describes the demographic characteristics of the region. Census 2000 provides information on number of residents, their age, race and ethnicity, education levels, poverty status, and the industries and occupations in which they are employed. Analyses of Census 2000 for the Merrimack Valley region were provided by the Merrimack Valley Planning Commission and the Center for Labor Market Studies at Northeastern University and the Commonwealth Corporation. Population growth estimates from the Massachusetts Institute for Social and Economic Research (MISER) were used to project the future demographics of the region. Data on unemployment was provided by the Massachusetts Division of Employment Training (DET).

To augment the secondary data described above, several analyses of customers of the workforce development system in the Merrimack Valley were also utilized. The Rapid Response unit of the Massachusetts Division of Employment Training provided information on laid off in several manufacturing company dislocations in the region as well as one medical supply shipping dislocation that occurred outside the region but whose employees were primarily from the Merrimack Valley. In addition, an analysis of job seeker customers of the Valleyworks Career Center was conducted for the MVWIB by the Commonwealth Corporation and the results of the analysis were incorporated into the Blueprint. Finally, a survey of participants in Adult Basic Education and English for Speakers of Other Languages courses in the region was included in the Blueprint analysis.

The "Self Sufficiency Standard"² was used to provide an analysis of the income requirements of residents of the Merrimack Valley to meet their basic household needs. Most analysts currently consider the poverty levels determined by the US Bureau of Labor Statistics to be an inaccurate measure of the resources that today's families require to survive. Therefore, we use the Self-Sufficiency Standard to look at basic household income requirements in the Merrimack Valley region and the Commonwealth of Massachusetts. The Self-Sufficiency Standard measures the amount of income required to cover basic costs in the marketplace without government subsidies. Cost categories addressed by the Self-Sufficiency Standard include housing, child care, food, transportation, health care and taxes. Analyses are conducted for different family sizes. Analyses are also conducted for different regions of the state, which is particularly important for the Blueprint since Merrimack Valley families face high costs in several of these categories, particularly housing and transportation.

INDUSTRY ANALYSIS

The first critical component of the blueprint research was the selection of the critical and emerging industries. The MVWIB Blueprint Committee (see Appendix B) began

FIGURE 2.2 CRITICAL AND EMERGING INDUSTRY CRITERIA

Critical industries:

- Volume: Large numbers of jobs currently in the region
- Stability: Historically have been large employers and are projected to continue to be large employers in the future
- Possessing a significant proportion of jobs that require less than a bachelor's degree
- Have strong potential or current career ladders
- Offer the opportunity to obtain self-sufficiency wages
- Cluster with other critical and emerging industries

Emerging industries:

- Employed at least 1,000 in the region and have shown rapid employment growth in the past five years
- Are in wealth-creating industries
- Can build on existing labor force and workforce development system strengths and the physical assets of the region
- Have high percentages of new and emerging occupations

by examining all of the industries which employed more than 1000 workers in the Merrimack Valley region in 2001 (the latest date for which full year data was available at the time). Information was presented on the total number of employees and firms in each industry in the region, as well as the average weekly wage in each industry.³

The committee further developed a set of criteria to narrow this list down to a set of 3-5 critical and 2-3 emerging industries. In addition to the critical and emerging industries that were selected using the criteria in Figure 2.2, four other industries were included as "watch list" industries due to their relevance to economic development efforts in the region and their potential to grow to be major regional employers in the future. These industries will be given brief treatment in the concluding chapter of this report and will be given more detailed consideration in updates of the Blueprint and further research conducted by the MVWIB and its partners.

Data for the selection process described above was from the Covered Employment and Wages (ES-202) program of DET. DET also provided occupational matrices indicating the percentage of employment in each occupation employing more than one half of one percent of all employees in an industry. The Occupational Employment Statistics (OES) program provides information on the mean and median wages for various occupations in the Merrimack Valley. This program is run by DET and the Bureau of Labor Statistics jointly. The Bureau of Labor Statistics provided projections of occupation and industry employment in the commonwealth.

As a final step in the quantitative data analysis, occupational matrices were constructed for each sector of the critical and emerging industries for which data were available. The matrices (see Appendix A) provide information on the estimated number of employees in the Merrimack Valley in each occupation that requires less than a Bachelor's degree⁴, the mean and median wages for each occupation, growth projections for each occupation, and the level of occupation (see below). These occupational matrices serve three main purposes. First, an examination of the wages in the major occupations in an industry helps determine whether an investment in training for these occupations is likely to lead to economic self-sufficiency for workers. Second, an examination of the occupations in an industry allows one to focus on the largest, best-paying, or fastest growing occupations when developing training programs and conducting other workforce development activities. Third, an analysis of the mix of jobs at different skill and training levels provides information on the potential for career ladder development within the industry.⁵

The occupational levels are a tri-variate delineation of occupations that require less than a Bachelor's degree in formal education. While based on quantitative data, the levels are fundamentally a qualitative measure. To determine the level of each occupation in an industry or sector matrix, the occupations were first grouped based on similar functions and skill sets. The skill and educational requirements and wages were examined and the occupations in a grouping were ranked as Level One, Level Two, or Level Three. The levels indicate progressively increasing skills and educational requirements and commensurate wage increases. While the wage levels are comparable within a single occupational pathway, it is important to note that they are not comparable across occupational pathways due to the inherent inequities of the labor market. Within an occupational pathway, increasing levels also generally require additional skills, experience, and/or educational attainment. The additional amount of these factors required to advance from one level to the next will vary between different occupational pathways.

The number of jobs in an industry or sector at each of the levels described above were examined to determine the career ladder potential of the industry or sector. Career ladder potential is defined as having a mixture of Level One, Level Two, or Level Three jobs in the occupational matrix. Information from the occupational matrix is combined with information from employer interviews to determine the existence of or potential for career ladders in specific industries and sectors in the Merrimack Valley. These career ladders are reported in Chapters Four, Five, and Six.

In addition to the secondary data sources described above, a number of research

reports, industry studies, and newspaper and journal publications were consulted to provide background information and as sources of best practices. Many of these reports are cited in the body of the Blueprint, others are listed in Appendix D.

Information from employers is the most important component of this report. Employers were interviewed in each of the critical and emerging industries, using the interview protocol in Appendix C. Employers were asked to provide information on skill and education requirements for the major occupations in their firms, what occupations and skills they were having a difficult time hiring for, and what occupations they thought would become important in the future. The information from the employer interviews in each industry was aggregated to provide a comprehensive picture of the employment opportunities in that industry in the Merrimack Valley. To protect company-specific and proprietary information, no data linked to a specific company is provided.

Employers who were interviewed were identified through consultations with economic development officials, Chamber of Commerce staff, board members of the MVWIB, Valleyworks Career Center staff, and from trade associations and industry directories for the critical and emerging industries.

REGIONAL TRAINING SYSTEM ANALYSIS

To provide policy-relevant recommendations on how the Merrimack Valley's workforce development system can better meet the needs of employers and residents of the region, an analysis of the regional training system was required. Existing education and training resources were reviewed in light of the needs of the region's critical and emerging industries as identified in this Blueprint. The goal was to determine how well equipped the system is to meet the employer-identified needs currently and to make recommendations for systems improvement to better meet those needs in the future.

The first step in conducting the regional training system analysis was to collect data on current training efforts. Information was collected from the Massachusetts Occupational Information Coordinating Committee (MOICC), the Division of Employment Training, and the Massachusetts One-Stop Employment System (MOSES), which contains information on vendors of the MVWIB. Training program and vendor information was organized by type of training provided and by industry, enabling a cross-comparison between the region's critical and emerging industries and programs that currently provide relevant training to each industry.

POTENTIAL SOURCES OF ERROR

Any research effort contains sources of error within it and it is important to identify those potential sources from the beginning.

- The projections from MISER for population growth and from the Bureau of Labor Statistics for occupation and industry growth, although they have been shown to be highly accurate overall, are likely to contain significant inaccuracies in at least some of the projections.⁶
- The Self-Sufficiency Standard data are provided for geographic areas based on Census Bureau designations. The most relevant data for the Merrimack Valley are located in Table VI.⁷ The municipalities of Amesbury, Newbury, Newburyport, Rowley, and Salisbury are not included. To the extent that these municipalities are significantly different from the region as a whole, error may be introduced into this component of the study.
- Industry data from DET are the best available real-time data on employment by industry and sector. However, data are not made public on some industries due to the concentration of regional employment in a small number of businesses.
- The level methodology contains two main sources of potential error. Because we are not aware of the sub-sector composition that the aggregate occupational

matrices are based on, we cannot be sure that one sub-sector did not predominate, resulting in over- or under-statement of the numbers of jobs in some levels in an industry or sector. Because of the relatively large numbers of jobs that we are reporting, it seems likely that such errors are likely to be small. The other main potential error is the over- or under-reporting of particular occupations. This problem cannot be resolved directly due to the limitations of the data. Therefore, programs using the Blueprint to inform workforce development activities are advised to work closely with specific employers to determine their occupational mix as part of the program development process.

- There are obvious sources of potential error arising from the employer interviews which form the core of this report's findings. The employers interviewed may not have been representative of the total employer base in that industry in the region. In addition, employer responses may not meet traditional standards of reliability and validity due to the small sample sizes and the lack of a randomized survey methodology. These potential sources of error have been taken into account and addressed as well as possible by attempting to complete 8-12 surveys in each critical and emerging industry and by selecting employers who are among the largest in their respective industries in the Merrimack Valley region.
- Finally, the shift from the Standard Industrial Classification (SIC) system to the North American Industrial Classification System (NAICS) for categorizing industries resulted in some cases where it was not possible to make apples-to-apples comparisons across the two systems. Therefore, industry data are reported by SIC code through 2001, and by NAICS codes for 2002. Every effort is made to provide information in the Blueprint narrative when there are data comparability issues across the two systems.

ENDNOTES

1 Note: Unless otherwise specified, the term Merrimack Valley should be taken to refer to the fifteen municipalities in Merrimack Valley Workforce Investment Area for the purposes of this report. In common usage, Merrimack Valley is often taken to include parts of the Greater Lowell region as well.

2 See Diana Pearce, with Jennifer Brooks, *The Self-Sufficiency Standard for Massachusetts*. Boston, MA: The Women's Educational and Industrial Union, April 2003.

3 Industries are presented at the two digit Standard Industrial Classification (SIC) level. The SIC system was phased out in 2001 and was replaced by the North American Industrial Classification System (NAICS). For details about the NAICS, see <http://www.census.gov/naics>

4 Estimates of the educational requirements of occupations are provided by the Bureau of Labor Statistics Occupational Employment Statistics program. It is important to note that the educational requirements provided are minimum requirements and in some cases, particularly during economic downturns, people with Bachelor's degrees are found in occupations that do not require such a high level of educational attainment.

5 This methodology and that of the determination of occupational levels were initially developed by O. Steven Quimby and Claudia Green at the Center for Community Economic Development, University of Massachusetts Boston. Its initial use came in the publication, *The Southern Essex Regional Labor Market: A Blueprint*, 2000, Claudia Green, O. Steven Quimby, Randall Wilson, and Yolanda Gilibert. Portions of this section follow pages 6 and 7 of the Southern Essex report quite closely.

6 For a candid delineation of the BLS occupational projections, see "The 1988-2000 employment projections: How accurate were they?" 2003, Andrew Alpert and Jill Auyer, *Occupational Outlook Quarterly* 47 (1).

7 Source: Diana Pearce, with Jennifer Brooks, *The Self-Sufficiency Standard for Massachusetts*. Boston, MA: The Women's Educational and Industrial Union, April 2003, p. 60.

Chapter 3. Merrimack Valley Residents



The necessary starting point for any analysis of the regional labor market is with the supply side, the region's labor force. This chapter includes an analysis of the regional labor market including demographic characteristics and trends, education and skills profiles of the regional labor force, and workforce attachment data. In addition to the regional overview, we also provide a detailed analysis of several critical components of the regional labor market including displaced manufacturing workers from Lucent Technologies and A+/Solectron and recent immigrants. The analyses of niche components of the labor market draw upon recent studies conducted on behalf of the Merrimack Valley Workforce Investment Board (MVWIB) and represent the most recent work done in this area. These analyses will provide baseline information on skills and education that will be compared to the needs of the critical and emerging industries throughout the region, as described later in this report.

DEMOGRAPHICS

318,556 people lived in the Merrimack Valley region in 2000.¹ The three largest cities in the region by population are Lawrence, with 72,043 residents, Haverhill, with 58,969 residents, and Methuen, with 43,789 residents.

Since 1960, the Merrimack Valley region has grown at a considerably faster rate than the Commonwealth as a whole. From 1990 to 2000, the population of the Merrimack Valley region grew 10.5%, while the population of the Commonwealth grew only 5.5%. In general, the smaller municipalities in the region grew faster than the cities. For example, Boxford's population grew 26.4%, Rowley grew 23.5%, and West Newbury grew 21.5% between 1990 and 2000. The region's population is projected to grow 9.35% between 2000 and 2010.²

In a period where Massachusetts would have actually lost population without immigration³, the growth of the Merrimack Valley is truly impressive. However, the lack of job growth in the region, discussed below, brings into question whether or not the region's population growth is sustainable.

The Merrimack Valley region's population as a whole is 83.1% white, according to Census 2000. This figure is roughly in line with the state's population, which is 84.5% white. The region contains fewer Black/African American and Asian residents than the Commonwealth. Interestingly, Andover and North Andover contain higher percentages of Asian residents than the state average.

Where the Merrimack Valley differs most significantly from the state in terms of race and ethnicity is in the percentage of population that is of Hispanic or Latino origin.⁴ As shown in Figure 3.3, the Merrimack Valley region contains 17.0% persons of Hispanic origin, compared to 6.8% statewide. One of every 8 persons of Hispanic origin

FIGURE 3.1 MERRIMACK VALLEY POPULATION: 1960-2000

| Area Name | 1960 | 1970 | 1980 | 1990 | 2000 |
|------------------|---------|---------|---------|---------|---------|
| Amesbury | 10,787 | 11,388 | 13,971 | 14,997 | 16,450 |
| Andover | 17,134 | 23,695 | 26,370 | 29,151 | 31,247 |
| Boxford | 2,010 | 4,032 | 5,374 | 6,266 | 7,921 |
| Georgetown | 3,755 | 5,290 | 5,687 | 6,384 | 7,377 |
| Groveland | 3,297 | 5,382 | 5,040 | 5,214 | 6,038 |
| Haverhill | 46,346 | 46,120 | 46,865 | 51,418 | 58,969 |
| Lawrence | 70,933 | 66,915 | 63,175 | 70,207 | 72,043 |
| Merrimac | 3,261 | 4,245 | 4,451 | 5,166 | 6,138 |
| Methuen | 28,114 | 35,456 | 36,701 | 39,990 | 43,789 |
| Newbury | 2,519 | 3,804 | 4,529 | 5,623 | 6,717 |
| Newburyport | 14,004 | 15,807 | 15,900 | 16,317 | 17,189 |
| North Andover | 10,908 | 16,284 | 20,129 | 22,792 | 27,202 |
| Rowley | 2,783 | 3,040 | 3,867 | 4,452 | 5,500 |
| Salisbury | 3,154 | 4,179 | 5,973 | 6,882 | 7,827 |
| West Newbury | 1,844 | 2,254 | 2,861 | 3,421 | 4,149 |
| Merrimack Valley | 220,849 | 247,891 | 260,893 | 288,280 | 318,556 |

Source: Merrimack Valley Planning Commission analysis of US Census data.

in the Commonwealth of Massachusetts lives in the Merrimack Valley region. In the region's largest city, Lawrence, 43,019 residents are of Latino origin out of 72,043 total residents, making Latinos the majority of the city's residents.

The population of the city of Lawrence would have decreased from 1990 to 2000

FIGURE 3.2 MERRIMACK VALLEY GROWTH RATE: 1960-2000

| Area Name | 1960-70 % ch. | 1970-80 % ch. | 1980-90 % ch. | 1990-00 % ch. |
|------------------|------------------|------------------|------------------|------------------|
| Amesbury | 5.6 | 22.7 | 7.3 | 9.7 |
| Andover | 38.3 | 11.3 | 10.5 | 7.2 |
| Boxford | 100.6 | 33.3 | 16.6 | 26.4 |
| Georgetown | 40.9 | 7.5 | 12.3 | 15.5 |
| Groveland | 63.2 | -6.3 | 3.4 | 15.8 |
| Haverhill | -0.5 | 1.6 | 9.7 | 14.7 |
| Lawrence | -5.7 | -5.6 | 11.1 | 2.6 |
| Merrimac | 30.2 | 4.8 | 16.1 | 18.8 |
| Methuen | 26.1 | 3.5 | 9 | 9.5 |
| Newbury | 51 | 19.1 | 24.2 | 19.5 |
| Newburyport | 12.9 | 0.6 | 2.6 | 5.3 |
| North Andover | 49.3 | 23.6 | 13.2 | 19.3 |
| Rowley | 9.2 | 27.2 | 15.1 | 23.5 |
| Salisbury | 32.5 | 42.9 | 15.2 | 13.7 |
| West Newbury | 22.2 | 26.9 | 19.6 | 21.3 |
| Merrimack Valley | 12.2 | 5.2 | 10.5 | 10.5 |
| Massachusetts | 10.5 | 0.84 | 4.9 | 5.5 |

Source: Merrimack Valley Planning Commission analysis of US Census data.

FIGURE 3.3 MERRIMACK VALLEY POPULATION BY RACE AND ETHNICITY: 2000

| Area Name | White | Black/ African Amer. | Amer. Indian/ Alaska Native | Asian | Native Hawaiian/ Other Pacific Islander | Persons of 2 or more races | | Persons of Hispanic Origin |
|------------------|-------|----------------------------|--------------------------------------|-------|---|-------------------------------------|---------------|-------------------------------------|
| | | | | | | Other Race | Other Race | |
| Amesbury | 97.2% | 0.6% | 0.2% | 0.6% | 0.0% | 0.2% | 1.1% | 0.9% |
| Andover | 91.6% | 0.7% | 0.1% | 5.7% | 0.0% | 0.8% | 1.0% | 1.8% |
| Boxford | 97.4% | 0.3% | 0.1% | 1.2% | 0.0% | 0.3% | 0.6% | 0.8% |
| Georgetown | 98.5% | 0.1% | 0.1% | 0.4% | 0.0% | 0.3% | 0.5% | 0.6% |
| Groveland | 98.4% | 0.3% | 0.1% | 0.6% | 0.0% | 0.1% | 0.4% | 0.5% |
| Haverhill | 89.7% | 2.4% | 0.2% | 1.4% | 0.0% | 4.3% | 2.0% | 8.8% |
| Lawrence | 48.6% | 4.9% | 0.8% | 2.7% | 0.1% | 36.7% | 6.2% | 59.7% |
| Merrimac | 98.3% | 0.4% | 0.1% | 0.3% | 0.0% | 0.3% | 0.7% | 0.9% |
| Methuen | 89.4% | 1.3% | 0.2% | 2.4% | 0.0% | 4.9% | 1.8% | 9.6% |
| Newbury | 98.3% | 0.4% | 0.1% | 0.4% | 0.0% | 0.3% | 0.4% | 0.9% |
| Newburyport | 98.1% | 0.4% | 0.1% | 0.6% | 0.0% | 0.2% | 0.6% | 0.9% |
| N. Andover | 93.7% | 0.7% | 0.1% | 4.0% | 0.1% | 0.7% | 0.8% | 2.0% |
| Rowley | 98.4% | 0.2% | 0.3% | 0.5% | 0.0% | 0.3% | 0.4% | 0.9% |
| Salisbury | 97.5% | 0.4% | 0.3% | 0.3% | 0.1% | 0.3% | 1.0% | 1.2% |
| W. Newbury | 98.5% | 0.2% | 0.0% | 0.5% | 0.0% | 0.4% | 0.4% | 0.7% |
| Merrimack Valley | 83.1% | 2.0% | 0.3% | 2.2% | 0.0% | 10.0% | 2.4% | 17.0% |
| Massachusetts | 84.5% | 5.4% | 0.2% | 3.8% | 0.0% | 3.7% | 2.3% | 6.8% |

Source: Merrimack Valley Planning Commission analysis of US Census data.

if not for the growth of the Latino population. While the non-Latino population in the region grew 4.4% from 1990-2000, the Latino population grew 54.3% over the same time period. Latino population growth was the primary driver for population growth in the region. This fact will have profound consequences for employers and the workforce development system in the region.

As shown in Figure 3.5, in 2000 Puerto Rican and Dominican were the largest origins of people of Hispanic origin. In Lawrence, the city in the region with the largest Hispanic population, the largest group of residents of Hispanic origin identified themselves as Dominican (16,186), followed by Puerto Rican (15,816), and other Hispanic (8,567). This demonstrates a change from 1990, when the largest group of Hispanic origin residents identified themselves as Puerto Rican (14,928), followed by Dominican (10,870), and other Hispanic (1,735).⁵

IMMIGRANT STATUS

50,415 (15.8%) of the Merrimack Valley's residents were foreign-born according to Census 2000, slightly greater than the 13.8% of the state's population that were foreign-born.⁶ 30.9% of the region's foreign-born population were recent immigrants, having entered the United States between 1990 and 2000.

Furthermore, nearly half (48%) of the change in population in the Merrimack Valley between 1990 and 2000 was due to foreign-born immigrants. In the largest cities in the region, this fact is particularly evident. Lawrence would have lost 6,125 residents without foreign-born immigration. Instead, it gained 1,836 residents. Methuen gained 3,799 residents, of which 1,935 were foreign-born. Overall, the region grew by 30,276 residents between 1990 and 2000. 14,510 of these new residents were foreign-born.⁷

A recent survey of students in ESOL and GED classes in Lawrence and Haverhill highlights the diversity of immigrants residing in the Merrimack Valley.⁸ Nearly half of the survey respondents were from the Dominican Republic. More than twenty countries were represented in the survey, including India, Russia, Vietnam, Guatemala, Columbia, and Brazil. Sixty-five percent of survey respondents had high school or university

FIGURE 3.4 MERRIMACK VALLEY LATINO POPULATION CHANGE: 1990-2000

| Area Name | % Population Change | | |
|------------------|---------------------|------------|--------|
| | Total | Not Latino | Latino |
| Amesbury | 9.7% | 9.3% | 62.5% |
| Andover | 7.2% | 6.8% | 30.9% |
| Boxford | 26.4% | 26.0% | 97.1% |
| Georgetown | 15.6% | 15.1% | 261.5% |
| Groveland | 15.8% | 15.9% | 3.7% |
| Haverhill | 14.7% | 10.5% | 90.6% |
| Lawrence | 2.6% | -29.2% | 47.1% |
| Merrimac | 18.8% | 18.4% | 96.4% |
| Methuen | 9.5% | 4.3% | 103.9% |
| Newbury | 19.5% | 19.3% | 41.9% |
| Newburyport | 5.3% | 5.0% | 65.9% |
| N.Andover | 19.3% | 18.6% | 76.2% |
| Rowley | 23.5% | 22.8% | 291.7% |
| Salisbury | 13.7% | 13.2% | 84.0% |
| W.Newbury | 21.3% | 21.1% | 58.8% |
| Merrimack Valley | 10.5% | 4.4% | 54.3% |
| Massachusetts | 5.5% | 3.3% | 49.1% |

Source: Merrimack Valley Planning Commission analysis of US Census data.

FIGURE 3.5 HISPANIC POPULATION BY TYPE OF HISPANIC ORIGIN: 2000

| Area | Total Hispanic | Mexican | Puerto Rican | Cuban | Dominican | Central American | South American | Other Hispanic |
|------------------|----------------|---------|--------------|-------|-----------|------------------|----------------|----------------|
| Amesbury | 156 | 33 | 37 | 19 | 8 | 23 | 10 | 26 |
| Andover | 567 | 65 | 169 | 59 | 72 | 15 | 62 | 125 |
| Boxford | 67 | 4 | 18 | 2 | 7 | 3 | 16 | 17 |
| Georgetown | 47 | 10 | 11 | 1 | 0 | 8 | 7 | 10 |
| Groveland | 28 | 6 | 3 | 5 | 1 | 3 | 5 | 5 |
| Haverhill | 5,174 | 34 | 2,242 | 84 | 1,179 | 189 | 114 | 1,026 |
| Lawrence | 43,019 | 316 | 15,816 | 408 | 16,186 | 1,001 | 725 | 8,567 |
| Merrimac | 55 | 8 | 15 | 2 | 9 | 6 | 9 | 6 |
| Methuen | 4,221 | 70 | 1,691 | 73 | 1,308 | 116 | 115 | 848 |
| Newbury | 61 | 11 | 16 | 7 | 9 | 3 | 5 | 10 |
| Newburyport | 151 | 28 | 38 | 13 | 13 | 4 | 20 | 35 |
| North Andover | 541 | 52 | 133 | 51 | 92 | 20 | 91 | 102 |
| Rowley | 47 | 17 | 9 | 0 | 8 | 3 | 3 | 7 |
| Salisbury | 92 | 10 | 37 | 6 | 4 | 7 | 6 | 22 |
| West Newbury | 27 | 3 | 7 | 0 | 2 | 1 | 10 | 4 |
| Merrimack Valley | 54,253 | 973 | 20,242 | 730 | 18,898 | 1,402 | 1,198 | 10,810 |
| Massachusetts | 428,729 | 22,288 | 199,207 | 8,867 | 49,913 | 38,317 | 28,306 | 82,101 |

Source: Northeastern University Center for Labor Market Studies analysis of US Census data.

degrees from their country of origin and more than one-third of these degrees were in technical skills areas that are in demand as determined by the US Department of Labor when determining areas of demand for H-1B technical skills grants.⁹

EDUCATION AND SKILLS

The Merrimack Valley region slightly trails the Commonwealth in educational attainment, but with extreme variation between the region's municipalities. Overall, 84.8% of Massachusetts residents over the age of 25 had at least a high school diploma in 2000, while 82.4% of Merrimack Valley residents had achieved that credential. 13.7% of Massachusetts residents had a graduate or professional degree, while 12.0% of Merrimack Valley residents were similarly educated.

The Merrimack Valley has municipalities that have both very high and very low levels of educational attainment. Figure 3.6 shows that Lawrence had 41.8% of its residents ages twenty-five and over without at least a high school diploma, while neighboring Andover had 29.9% of its residents with a graduate or professional degree. Several municipalities, including Salisbury, Haverhill, and Merrimac, have average or slightly lower than average percentages of residents with high and low levels of education, but high levels of residents with high school diplomas and no college. Each of these educational profiles carries with it different consequences for workforce development which are considered in detail in Chapter 8.

A significant educational challenge for the region is the significant population for whom Poor English Speaking Skills and Linguistic Isolation are a problem. Individuals with Poor English Speaking Skills are defined as those who indicated speaking English "not well" or "not at all" on

Census 2000. Linguistic Isolation is defined as a household in which all individuals 14 years of age or older reported not speaking English or speaking English less than very well. 5.8% of the region's population ages 18-64 self-identified as having Poor English Speaking Skills in 2000, up from 4.6% in 1990. Similarly, 5.8% of the region's households were linguistically isolated in 2000. These problems are concentrated in the region's largest city, Lawrence, where 20.1% of residents had Poor English Speaking Skills and 19.8% of households were linguistically isolated in 2000.¹⁰

Education also varies considerably within the

FIGURE 3.6 MERRIMACK VALLEY POPULATION BY EDUCATIONAL ATTAINMENT:2000

| Area name | Less than High School | High School Graduate | Some College | Associate | Bachelor's | Graduate or Professional |
|------------------|-----------------------|----------------------|--------------|-----------|------------|--------------------------|
| Amesbury | 12.30% | 31.90% | 20.30% | 9.10% | 17.10% | 9.30% |
| Andover | 4.30% | 14.00% | 13.00% | 6.10% | 32.70% | 29.90% |
| Boxford | 0.60% | 13.10% | 15.70% | 7.70% | 34.40% | 28.50% |
| Georgetown | 9.70% | 25.20% | 19.50% | 7.20% | 28.00% | 10.40% |
| Groveland | 7.70% | 24.20% | 24.10% | 9.90% | 26.70% | 7.40% |
| Haverhill | 16.30% | 31.10% | 20.20% | 9.00% | 16.10% | 7.30% |
| Lawrence | 41.80% | 29.60% | 14.40% | 4.30% | 5.80% | 4.10% |
| Merrimac | 9.80% | 30.10% | 21.40% | 7.90% | 19.50% | 11.30% |
| Methuen | 18.20% | 33.20% | 16.70% | 8.90% | 15.70% | 7.30% |
| Newbury | 4.40% | 24.70% | 18.40% | 8.70% | 27.60% | 16.20% |
| Newburyport | 9.70% | 21.00% | 18.50% | 8.60% | 25.10% | 17.10% |
| North Andover | 6.90% | 19.80% | 16.40% | 6.50% | 29.50% | 20.90% |
| Rowley | 10.30% | 26.10% | 17.90% | 9.60% | 23.70% | 12.40% |
| Salisbury | 15.90% | 39.50% | 18.40% | 9.00% | 12.00% | 5.20% |
| West Newbury | 3.30% | 16.90% | 14.10% | 8.40% | 33.70% | 23.60% |
| Merrimack Valley | 17.6% | 26.9% | 17.1% | 7.4% | 19.0% | 12.0% |
| Massachusetts | 15.2% | 27.3% | 17.1% | 7.2% | 19.5% | 13.7% |

Source: Merrimack Valley Planning Commission analysis of US Census data.

region by race and ethnicity. Fifty percent of all persons of Hispanic origin ages 25 and over have less than a high school degree. 25% of the same group have less than a ninth grade education. In contrast, 12.9% of white, non-Hispanic residents have less than a high school degree and only 4.5% have less than a ninth grade education. At the upper levels of educational attainment, only 7.4% of Hispanic residents have a Bachelor's degree or above, while 33% of the Merrimack Valley's white, non-Hispanic residents have such credentials.¹¹

Within the Merrimack Valley region, there are several pools of workers that have been displaced from employment due to plant shutdowns or mass layoffs.¹² These workers have particular skills and experience that can be utilized in economic development efforts in the region. These workers also bring specific challenges and opportunities to the workforce development system.

The largest pool of displaced workers in the Merrimack Valley is workers from Lucent Technologies and its manufacturing partner A+/Solectron.¹³ The decline of Lucent Technologies also displaced workers at a number of other companies in the region that were primarily providing products to Lucent. Many of these workers have technical skills similar to those of the Lucent and A+/Solectron workers.

A recent analysis of workers laid off by Lucent and A+/Solectron shows the following characteristics of these workers as a group:

- Compared to the overall of Massachusetts labor force, a higher percentage of the Lucent and A+/Solectron workers have high school degrees;
- 90% of Lucent and A+/Solectron workers in the survey were last employed in production and technical support occupations;
- The dominant occupations were Assemblers and Inspectors/Testers.¹⁴

One of the critical findings is the extent to which workers at Lucent Technologies were provided with extensive training. Therefore, workers displaced from Lucent who only have a high school diploma in formal education are likely to have considerably higher levels of technical education when the amount of company-provided training is factored in.¹⁵

The second group of displaced workers are those displaced when the Merck Medco facility in Wilmington closed.¹⁶ While the Merck Medco plant is not in the Merrimack Valley region, many of its employees were residents of the region, particularly the city of Lawrence. Most of the Merck Medco workers being served through the Merck Medco National Emergency Grant are Latinos who worked in material moving occupations, primarily in the warehousing and shipping departments of the company. The education levels, occupational experience, and experience with company-provided training are considerably lower for members of this group than for

former Lucent Technologies workers. However, the Merck Medco workers do have significant levels of employment experience in areas that may support emerging industries in the Merrimack Valley region.

WORKFORCE ATTACHMENT

The Merrimack Valley region had 156,064 people ages 16 and over in the labor force in 2000 according to the U.S. Census, for a labor force participation rate of 65.0%.¹⁷ Lawrence (54.9%), Methuen (64.0%), and North Andover (64.9%) trailed the state labor force participation rate of 66.2%.

The Merrimack Valley region has traditionally had one of the highest unemployment rates in the state and the city of Lawrence has often had either first or second highest unemployment rate of any municipality in the state. The cities of Methuen and Haverhill historically have also had unemployment rates higher than the state of Massachusetts.

Unemployment rates at the time this Blueprint is being prepared are nearing ten-year highs in the region. What is different now is that all of the cities and towns in the region are being hit by unemployment, from affluent municipalities such as Boxford, Merrimac, and Andover, to the blue-collar cities of Methuen and Haverhill, to urban Lawrence. This reflects the current economic downturn's greater impact on residents employed in professional, technical, and managerial occupations than we have seen in the past twenty-five years. In addition, the Merrimack Valley region has historically placed a heavy reliance on the manufacturing industry. Because manufacturing has been one of the hardest hit industries nationwide during this economic downturn, the Merrimack Valley region has been particularly hard hit by rising unemployment. (see Chapter 5 for further details on manufacturing in the Merrimack Valley)

Merrimack Valley residents were concentrated in the Management and Professional and Sales and Office occupations in 2000.¹⁸

The region as a whole is under-represented in service and construction, extraction, and maintenance occupations. However, there is considerable variation between municipalities. More than 50% of Andover, Boxford, Newburyport, North Andover, and West Newbury workers are employed in management and professional occupations, while less than 25% of Lawrence and Salisbury workers are so employed. Lawrence and Salisbury residents are more likely to be employed in Service and Production, Transportation, and Material Moving occupations. Given that the latter are generally much lower paying, we identify part of the reason for the income and

FIGURE 3.7 UNEMPLOYMENT IN MERRIMACK VALLEY CITIES AND THE STATE: 1983-2002



Source: Massachusetts Division of Employment and Training.

FIGURE 3.8 MERRIMACK VALLEY RESIDENTS BY OCCUPATION TYPE: 2000

| Area Name | Management & Professional | Service | Sales and Office | Farming, Fishing & Forestry | Construction, Extraction & Maintenance | Production, Transportation, and Material Moving |
|------------------|---------------------------|---------|------------------|-----------------------------|--|---|
| Amesbury | 39.6% | 12.5% | 25.1% | 0.4% | 8.9% | 13.4% |
| Andover | 64.0% | 6.2% | 22.2% | 0.0% | 3.3% | 4.2% |
| Boxford | 61.9% | 5.9% | 25.8% | 0.0% | 3.5% | 3.0% |
| Georgetown | 44.7% | 14.5% | 24.0% | 0.0% | 9.0% | 7.8% |
| Groveland | 40.4% | 15.5% | 22.2% | 0.3% | 10.0% | 11.6% |
| Haverhill | 34.3% | 14.0% | 26.6% | 0.0% | 8.1% | 17.0% |
| Lawrence | 20.7% | 19.4% | 24.2% | 0.4% | 7.5% | 27.9% |
| Merrimac | 37.3% | 14.3% | 25.4% | 0.2% | 10.9% | 11.9% |
| Methuen | 36.0% | 12.8% | 27.1% | 0.1% | 8.5% | 15.4% |
| Newbury | 47.7% | 9.8% | 24.3% | 0.5% | 9.3% | 8.3% |
| Newburyport | 50.4% | 11.3% | 23.2% | 0.2% | 6.2% | 8.7% |
| North Andover | 51.8% | 10.3% | 27.4% | 0.2% | 4.6% | 5.7% |
| Rowley | 44.4% | 10.1% | 23.5% | 1.1% | 9.1% | 11.8% |
| Salisbury | 24.8% | 14.9% | 26.1% | 0.5% | 12.4% | 21.2% |
| West Newbury | 51.9% | 9.9% | 27.2% | 0.4% | 4.1% | 6.6% |
| Merrimack Valley | 39.8% | 13.0% | 25.3% | 0.2% | 7.3% | 14.4% |
| Massachusetts | 41.1% | 14.1% | 25.9% | 0.2% | 7.5% | 11.3% |

Source: Merrimack Valley Planning Commission analysis of US Census data.

poverty disparities discussed in the next section.

One set of occupations that can offer workers decent wages without requiring high levels of educational attainment are the construction trades. However, in the Merrimack Valley region, only the municipalities of Groveland, Merrimac, and Salisbury have more than 10% of their workforce employed in construction, extraction, and maintenance occupations. The region's 7.3% of employment in these occupations is lower than the state average.

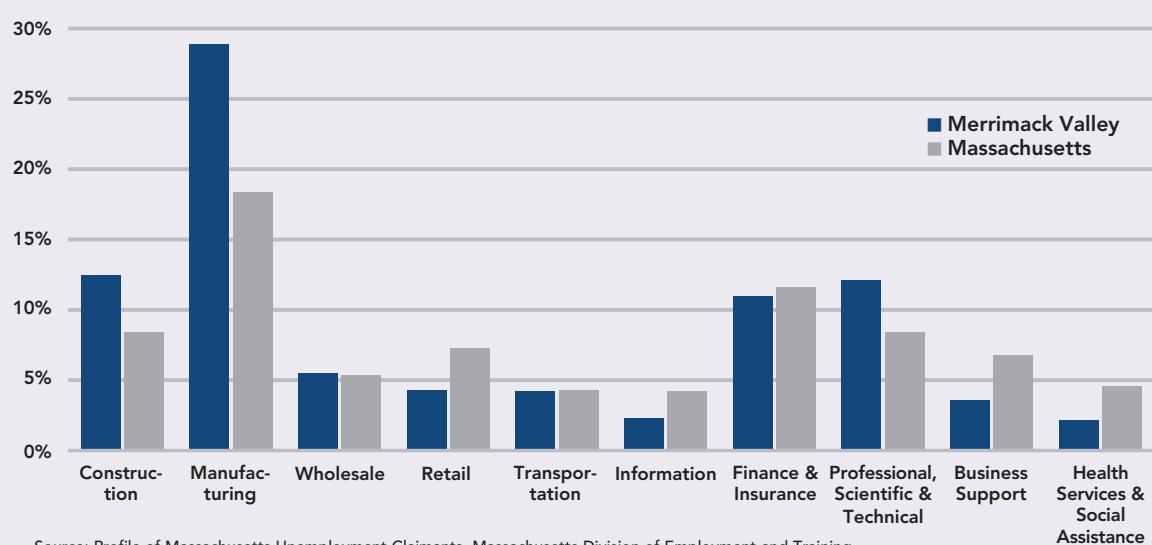
Another way to look at a region's labor market from the supply side is to examine the industries in which a region's residents are employed.¹⁹ As shown in Figure 3.9, Merrimack Valley residents were dramatically

FIGURE 3.9 MERRIMACK VALLEY RESIDENTS' EMPLOYMENT

| Area Name | Agriculture, Forestry, Fishing, Mining | Construction | Manufacturing | Wholesale Trade | Retail Trade | Transportation, Warehousing, & Utilities | Information | Finance, Insurance, Real Estate, Rental & Leasing |
|--------------------|--|--------------|---------------|-----------------|--------------|--|-------------|---|
| Amesbury | 62 | 488 | 1,765 | 389 | 973 | 372 | 276 | 445 |
| Andover | 15 | 514 | 2,516 | 491 | 1,470 | 274 | 827 | 1,426 |
| Boxford | 0 | 200 | 591 | 173 | 386 | 71 | 140 | 460 |
| Georgetown | 9 | 306 | 614 | 124 | 373 | 157 | 177 | 215 |
| Groveland | 8 | 180 | 496 | 123 | 246 | 145 | 147 | 149 |
| Haverhill | 40 | 1,501 | 6,577 | 1,038 | 3,144 | 1,406 | 986 | 1,868 |
| Lawrence | 78 | 992 | 6,756 | 1,267 | 2,612 | 1,097 | 440 | 1,024 |
| Merrimac | 41 | 284 | 693 | 128 | 341 | 131 | 138 | 159 |
| Methuen | 44 | 1,040 | 4,507 | 667 | 2,477 | 887 | 743 | 1,233 |
| Newbury | 55 | 296 | 466 | 138 | 419 | 169 | 168 | 225 |
| Newburyport | 25 | 513 | 1,448 | 334 | 823 | 292 | 503 | 708 |
| North Andover | 67 | 519 | 2,286 | 359 | 1,312 | 380 | 693 | 1,322 |
| Rowley | 39 | 220 | 441 | 178 | 251 | 118 | 104 | 185 |
| Salisbury | 29 | 336 | 815 | 100 | 497 | 261 | 130 | 188 |
| West Newbury | 20 | 114 | 262 | 60 | 219 | 41 | 110 | 190 |
| Merrimack Valley | 532 | 7,503 | 30,233 | 5,569 | 15,543 | 5,801 | 5,582 | 9,797 |
| Massachusetts | 12,440 | 173,940 | 405,368 | 103,333 | 353,019 | 131,820 | 118,432 | 259,538 |
| Merrimack Valley % | 0.4% | 5.0% | 20.2% | 3.7% | 10.4% | 3.9% | 3.7% | 6.5% |
| Massachusetts % | 0.4% | 5.5% | 12.8% | 3.3% | 11.2% | 4.2% | 3.7% | 8.2% |

Source: Merrimack Valley Planning Commission analysis of US Census data.

FIGURE 3.10 UNEMPLOYMENT INSURANCE CLAIMANTS BY INDUSTRY: QUARTER 4 2002



BY INDUSTRY: 2000

| Professional, Scientific, Management, Administrative, & Waste Management Services | Education, Health & Social Services | Arts, Recreation, Hotel & Food Services | Other Services (except Public Administration) | Public Administration |
|---|-------------------------------------|---|---|-----------------------|
| 792 | 2,004 | 490 | 246 | 269 |
| 2,845 | 3,323 | 523 | 411 | 510 |
| 591 | 924 | 80 | 117 | 146 |
| 477 | 890 | 193 | 179 | 147 |
| 298 | 822 | 280 | 182 | 101 |
| 2,616 | 6,142 | 1,671 | 1,427 | 1,260 |
| 2,402 | 4,883 | 1,936 | 1,298 | 987 |
| 204 | 730 | 220 | 165 | 119 |
| 1,992 | 3,981 | 1,084 | 935 | 1,220 |
| 442 | 730 | 219 | 86 | 134 |
| 1,182 | 1,982 | 777 | 316 | 436 |
| 1,918 | 2,869 | 627 | 431 | 490 |
| 339 | 747 | 154 | 185 | 73 |
| 276 | 727 | 332 | 210 | 163 |
| 406 | 523 | 90 | 105 | 61 |
| 16,780 | 31,277 | 8,676 | 6,293 | 6,116 |
| 365,561 | 750,610 | 214,026 | 138,635 | 134,365 |
| 11.2% | 20.9% | 5.8% | 4.2% | 4.1% |
| 11.6% | 23.7% | 6.8% | 4.4% | 4.3% |

over-employed (by 7.4%) in the manufacturing industry, as compared to the employment of Massachusetts residents as a whole. Offsetting the manufacturing employment, was slight under-employment in a number of industries. The most dramatic differences between the Merrimack Valley and the state were in Education, Health, and Social Assistance (2.8%) and Finance, Insurance, Real

Estate, and Rental and Leasing (1.7%).²⁰ When considering these data, it is important to recognize that they are from 2000 and the dramatic decline in manufacturing employment in the region was not fully underway until 2001 so the picture currently would look somewhat different. Furthermore, as shown in Figure 3.10, Merrimack Valley residents continue to lose jobs in manufacturing at a much higher rate than

residents of Massachusetts as a whole. In the fourth quarter of 2002, 28.9% of Merrimack Valley unemployment claimants were from the manufacturing industry, compared to 18.4% of unemployment claimants in the state of Massachusetts.

The Merrimack Valley region is a net exporter of workers. Said another way, there are more employed residents of the Merrimack Valley than there are jobs available in the region. In 2001, there were 12,500 more employed residents of the region than there were jobs.²¹ Many of the workers who live in the Merrimack Valley and work in other areas might be willing to work closer to home if there were appropriate jobs available for them in the region. Furthermore, this number is likely to dramatically underreport the number of additional workers in the region since many people who have not been attached to the formal labor market for a long period of time are not counted in most labor market studies, yet practical experience on the ground suggests that if appropriate jobs were

available, many of these residents would be eager to enter the world of work. When one combines the number of residents of the region who work outside the region, the number of dislocated workers in the region, and the number of residents who are not even included in traditional measures of the labor force, it is clear that there is a substantial supply of labor, at a variety of occupational levels, that could be attractive to businesses across a number of industries.

INCOME, POVERTY, AND ECONOMIC SELF-SUFFICIENCY

Per capita income in the Merrimack Valley is slightly lower than the statewide per capita income. However, there are significant differences between municipalities in the region. In 1989, Lawrence's per capita income of \$9,686 was 56% of the state's per capita income and Boxford's per capita income of \$30,634 was 178% of the state per capita income, while in 1999 Lawrence's per capita income of \$13,360 was only 51.5% of the state per capita income and Boxford's per capita income of \$48,846 had risen to 188.2% of the state per capita income. Merrimack Valley municipalities with lower per capita incomes than Massachusetts as whole in 1999 include Salisbury (83.3%), Methuen (85.9%), and Haverhill (89.7%). Merrimack Valley municipalities with per capita incomes more than 130% of the state per capita income in 1989 include Andover (158.5%), West Newbury (136.1%), Newbury (133.5%), North Andover (132.3%), and Newburyport (131.7%).²²

The percentage of families in poverty in the Merrimack Valley region as a whole is slightly above the percentage for Massachusetts families as a whole. In 1990, 6.7% of Massachusetts families were living below the poverty line, while 9.2% of Merrimack Valley families were living in poverty. In 2000, the percentage of Massachusetts families living below the poverty line remained the same, while the percentage for the Merrimack Valley decreased to 7.7%. Overall, the region is overweighted by the City of Lawrence, in which 25.6% of families lived below the poverty line in 1990, improving to 21.2% in 2000.²³ Every other municipality in the region has a smaller percentage of families below the poverty line than the regional average, and most are below the state average as well. It is interesting to note that some of the wealthier communities saw small but noticeable increases in the percentage of their families below the poverty line between 1990 and 2000.

FIGURE 3.11 MERRIMACK VALLEY PER CAPITA INCOME 1989-1999

| Area Name | 1990 Population | 1989 Per Capita Income (\$) | | 2000 Population | 1999 Per Capita Income (\$) | |
|------------------|-----------------|-----------------------------|--------|-----------------|-----------------------------|--------|
| | | % of State | State | | % of State | State |
| Amesbury | 15,101 | \$15,423 | 90.0% | 16,450 | \$24,103 | 92.9% |
| Andover | 29,151 | \$26,327 | 153.0% | 31,247 | \$41,133 | 158.5% |
| Boxford | 6,266 | \$30,634 | 178.0% | 7,921 | \$48,846 | 188.2% |
| Georgetown | 6,384 | \$17,571 | 102.0% | 7,377 | \$28,846 | 111.2% |
| Groveland | 5,223 | \$20,038 | 116.0% | 6,038 | \$25,430 | 98.0% |
| Haverhill | 51,418 | \$15,464 | 90.0% | 58,969 | \$23,280 | 89.7% |
| Lawrence | 70,207 | \$9,686 | 56.0% | 72,043 | \$13,360 | 51.5% |
| Merrimac | 5,166 | \$16,327 | 95.0% | 6,138 | \$24,869 | 95.8% |
| Methuen | 39,990 | \$15,598 | 91.0% | 43,789 | \$22,305 | 85.9% |
| Newbury | 5,623 | \$19,917 | 116.0% | 6,717 | \$34,640 | 133.5% |
| Newburyport | 16,351 | \$19,008 | 110.0% | 17,189 | \$34,187 | 131.7% |
| North Andover | 22,792 | \$22,957 | 133.0% | 27,202 | \$34,335 | 132.3% |
| Rowley | 4,452 | \$18,130 | 105.0% | 5,500 | \$27,413 | 105.6% |
| Salisbury | 6,744 | \$14,455 | 84.0% | 7,827 | \$21,608 | 83.3% |
| West Newbury | 3,412 | \$20,450 | 119.0% | 4,149 | \$35,323 | 136.1% |
| Merrimack Valley | 288,280 | \$16,603 | 96.4% | 318,556 | \$25,491 | 98.2% |
| Massachusetts | 6,016,425 | \$17,224 | 100.0% | 6,349,097 | \$25,952 | 100.0% |

Source: Merrimack Valley Planning Commission analysis of US Census data.

1999, the region saw a growing disparity of per capita incomes and families below the poverty line between municipalities. This disparity is a cause for concern to both workforce and economic development planners. Businesses that are considering locating or expanding in the region may be deterred by the concentration of low per capita incomes and high poverty rates in the region's population centers as

FIGURE 3.12 MERRIMACK VALLEY FAMILIES BELOW THE POVERTY LINE: 1990-2000

| Area Name | % Below Poverty Level in 1990 | % Below Poverty Level in 2000 | Percent Change Below Poverty Level, 1990-2000 |
|------------------|-------------------------------|-------------------------------|---|
| Amesbury | 5.4% | 3.9% | -1.5% |
| Andover | 2.1% | 2.5% | 0.4% |
| Boxford | 0.5% | 0.8% | 0.3% |
| Georgetown | 3.5% | 2.7% | -0.8% |
| Groveland | 0.5% | 3.0% | 2.5% |
| Haverhill | 7.4% | 7.0% | -0.3% |
| Lawrence | 25.6% | 21.2% | -4.4% |
| Merrimac | 3.0% | 1.9% | -1.1% |
| Methuen | 5.9% | 5.8% | -0.1% |
| Newbury | 1.5% | 1.2% | -0.3% |
| Newburyport | 3.9% | 2.8% | -1.1% |
| North Andover | 1.9% | 2.1% | 0.1% |
| Rowley | 1.4% | 3.3% | 2.0% |
| Salisbury | 5.7% | 4.5% | -1.1% |
| West Newbury | 1.4% | 2.8% | 1.3% |
| Merrimack Valley | 9.2% | 7.7% | -1.5% |
| Massachusetts | 6.7% | 6.7% | -0.1% |

Source: Merrimack Valley Planning Commission analysis of US Census data.

they may feel that this concentration signals social problems and a population not engaged in the world of work. Clearly, efforts of the workforce development system to address these issues, particularly among youth, will be important to the future economic success of the region.

Analysts have long recognized that the poverty line used by the federal government is an extremely imperfect measure of the amount of income that is required for a family to survive in local and regional economies. An accurate measure of what level of income families need to meet their basic needs should take into account local cost of living, the most important cost items for families, such as housing, childcare, rent, food, and taxes, and should also be adjustable for families of different compositions. In this report, we utilize Massachusetts Family Economic Self-Sufficiency Standard (MassFESS)²⁴ to further examine the extent to which Merrimack Valley families are able to meet their basic needs through wages available in the region generally and then specifically in the region's critical and emerging industries.

In the Merrimack Valley region,²⁵ a family comprised of one adult and one preschool child would need to have full-time employment paying an hourly wage of \$18.20 to meet basic needs without government subsidies (beyond tax credits). An adult with a single school age child would need an hourly wage of \$14.91, while an adult with a preschooler and a school age child would need to make \$21.53 per hour. A family of two adults a preschooler and a school age child would need to make \$12.24 for each adult, both working full-time.²⁶ By these standards, the number of families living below economic self-sufficiency in the Merrimack Valley greatly exceeds the number living below the poverty line, which is more frequently used as a measure of self-sufficiency.

It seems clear from the data that most entry-level jobs do not pay the hourly wages that the MassFESS standard makes clear that a family needs to survive in the region. However, the research for this report does show that there are some industries and occupations that offer better wages than others. Critically, some of these industries and occupations also offer better opportunities for training and career advancement, leading to career positions that do pay wages that meet the MassFESS standards. Throughout the Blueprint, we will refer back to the MassFESS standards for the Merrimack Valley region when examining the wage structures of occupations in the critical and emerging industries.

CONCLUSION: IMPORTANT LABOR SUPPLY POINTS

- The Merrimack Valley region has had more rapid population growth than the rest of the state over the past forty years. Between 1990 and 2000, the population of the Merrimack Valley grew by 10.5% while the population of Massachusetts grew by 5.5%.
- One out of every eight Latinos in the Commonwealth live in the Merrimack Valley region. Puerto Rico and the Dominican Republic are the origins of the Latino population in the Merrimack Valley, with the Dominican Republic showing the greatest percentage growth between 1990 and 2000.
- Educational attainment is a major issue for residents of the Merrimack Valley. While the region generally reflects Massachusetts' high levels of educational attainment, there are large pockets of residents with low educational levels. Since these areas are generally in the most populated cities in the region, this may be seen as a significant deterrent to economic development efforts to attract companies that need a skilled labor force to the region.

- The fastest growing segment of the Merrimack Valley's population, Hispanic residents, is also the least educated, with percentages of residents with less than a High School diploma more than double those of white, non-Hispanic residents.
- A large pool of technically skilled manufacturing workers who were displaced by layoffs at Lucent Technologies exists in the region. These workers received significant amounts of company-sponsored training that is readily transferable to a number of industries that might profitably locate in the Merrimack Valley.
- The Merrimack Valley region currently has a greater supply of labor than there is demand in the region. Therefore, workers are often forced to work outside the region. Many of these workers might wish to work in the region if there were opportunities available. This can be used as a competitive advantage for economic development planners to sell businesses on the advantage of locating in the region.
- The growing income disparity in the region is a cause for concern to workforce and economic development in the region because it indicates that there may be fewer workers available in the region over the long term to attract and retain businesses in critical and emerging industries in the region.
- For people to be effective workers, they need to be able to maintain their families' economic self-sufficiency. The wage rates required for self-sufficiency are higher than the government's formal poverty line measure. Therefore, any attempt to match the region's labor force with critical and emerging industries will require an examination of the wages and career ladders opportunities leading to economic self-sufficiency in those industries.

ENDNOTES

1 Source: US Census Bureau 2000 Census of Population and Housing.

2 Source: Massachusetts Institute for Social and Economic Research.

3 Paul Harrington and Mykhaylo Trub'skyy, *Immigrant Workers in the New England Labor Market: Implications for Workforce Development Policy*. Boston, MA: Northeastern University Center for Labor Market Studies, October 2002.

4 This report follows the naming conventions of the US Census when describing census data. The 2000 census used the term "Hispanic origin" rather than Latino/a. The popular convention will be followed when not discussing specific data sources.

5 Joseph Moonan and Kenneth Whelan, *Demographic and Economic Characteristics of the Population 1990-2000: Lower Merrimack Valley SDA*. Boston, MA: Center for Labor Market Studies, May 2003, p. 26.

6 Note: The Census includes people born in Puerto Rico as part of the foreign-born population.

7 Joseph Moonan and Kenneth Whelan, *Demographic and Economic Characteristics of the Population 1990-2000: Lower Merrimack Valley SDA*. Boston, MA: Center for Labor Market Studies, May 2003, p. 35.

8 Survey data available from the Merrimack Valley Workforce Investment Board.

9 The H-1B technical skills areas are high technology, information technology, biotechnology, advanced manufacturing, engineering, surveying, architecture, and computer hardware and software.

10 Joseph Moonan and Kenneth Whelan, *Demographic and Economic Characteristics of the Population 1990-2000: Lower Merrimack Valley SDA*. Boston, MA: Center for Labor Market Studies, May 2003, p. 42, 45, and 48.

11 Source: US Census Bureau 2000 Census of Population and Housing.

12 The layoffs considered here are those that have been large enough to result in National Emergency Grants.

13 The story of Lucent Technologies as a company will be discussed further in Chapter 5.

14 Robert Vinson, Gene White, and Johan Uvin, *Characteristics of the Lower Merrimack Valley Workforce: Findings from an Analysis of the Backgrounds and Work Histories of Employment Service Customers, Talent Bank, Users, and Displaced Workers*, Boston, MA: Commonwealth Corporation, May 2003.

15 For more information on the training system at Lucent Technologies and its predecessors,

see *Manufacturing the Future: A History of Western Electric*, Stephen Adams and Orville Butler, Cambridge University Press, 1999, and William Lazonick, Michael Fiddy, and O. Steven Quimby, "Grow Your Own" in the New Economy?: Skill-Formation Challenges in the New England Optical Networking Industry." In *Globalization, Universities, and Sustainable Development*, Robert Forrant and Jean Pyle, eds. Elgar Publishing, 2002.

16 Although the Merck Medco facility in Wilmington is outside the Merrimack Valley, the MWIB was selected to manage the Merck Medco National Emergency Grant because the majority of affected workers were residents of the Merrimack Valley region, primarily the City of Lawrence.

17 An individual is considered to be participating in the labor force if he or she is either working or has actively sought work in the past four weeks.

18 It is important to note that the labor market conditions that existed in 2000 are quite different from the present conditions. Also, there is a critical difference between the Census data, which is being used in this Chapter, and data from the Division of Employment and Training which will be used in the critical and emerging industry chapters. Census data describes the occupations of Merrimack Valley residents regardless of where they work, while the DET data describes workers employed at businesses in the region, regardless of where those workers live.

19 It is important to note that there is a difference between the industry data used in this chapter and the data that will be reported in Chapters 4-6. The data on industry of employment for residents states the industry in which a resident of the region works, regardless of where their job is located. The industry data in Chapters 4-6 describes employment by firms that are located in the region, regardless of where their workers reside.

20 Source: US Census Bureau 2000 Census of Population and Housing.

21 Robert Vinson, Gene White, and Johan Uvin, *Characteristics of the Lower Merrimack Valley Workforce: Findings from an Analysis of the Backgrounds and Work Histories of Employment Service Customers, Talent Bank, Users, and Displaced Workers*, Boston, MA: Commonwealth Corporation, May 2003.

22 Source: Merrimack Valley Planning Commission analysis of Census 2000 data.

23 Source: Merrimack Valley Planning Commission analysis of Census 2000 data.

24 See Diana Pearce, with Jennifer Brooks, *The Self-Sufficiency Standard for Massachusetts*. Boston, MA: The Women's Educational and Industrial Union, April 2003.

25 See Chapter 2 for details on the methodology for applying the MassFESS to the Merrimack Valley Workforce Investment Area.

26 Source: Diana Pearce, with Jennifer Brooks, *The Self-Sufficiency Standard for Massachusetts*. Boston, MA: The Women's Educational and Industrial Union, April 2003, p. 60. This report also includes Self-Sufficiency Standard calculations for other family compositions and other areas of Massachusetts.

Chapter 4. Critical Industries

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our main industries were selected as the critical industries for the Merrimack Valley region; Health Care, Construction, Communications and Manufacturing. Manufacturing, because of its unique characteristics in the Merrimack Valley, is covered separately in Chapter 5. The critical industries were selected based on the following criteria:

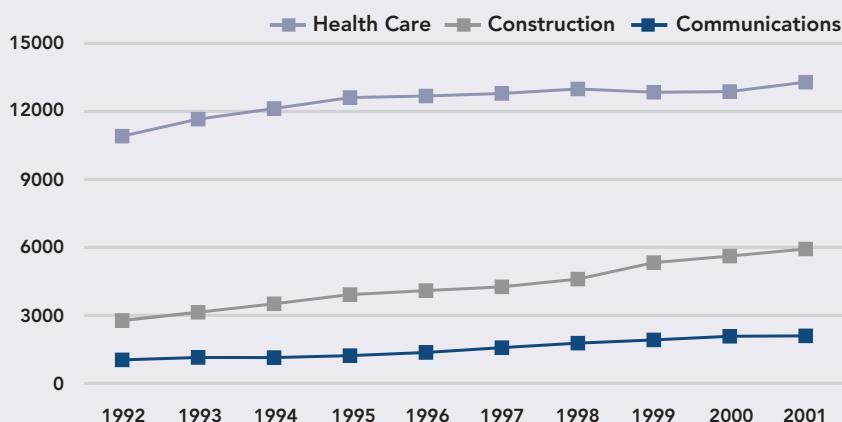
- being large employers in the region
- having a stable employment history of the past ten years
- employing a significant number of workers in positions that do not require a bachelor's degree
- offering career ladders opportunities for the advancement of workers to enable them to reach self sufficiency wages.

Each selected industry met most of those criteria. Where selected industries fall short on specific criteria, these will be addressed in the individual sections on those industries.

The remainder of this chapter focuses on the critical industries of Health Care, Construction and Communications. For each industry, we discuss the quantitative data available from the Division of Employment and Training for the industry and its main sectors, an analysis of the career ladders opportunities as shown by the volume of employment by levels¹ for jobs that do not require a Bachelor's degree,

and, most importantly, the results of survey with employers in the most important sectors of each of these industries. For each industry, we look at the demand for workers in particular occupations where employers are describing current or projected demand for particular skills, certifications, or education that would enable businesses to hire the workers they need and would enable residents of the Merrimack Valley region to access employment in these important industries in the region.

FIGURE 4.1 MERRIMACK VALLEY EMPLOYMENT IN CRITICAL INDUSTRIES: 1992 – 2001

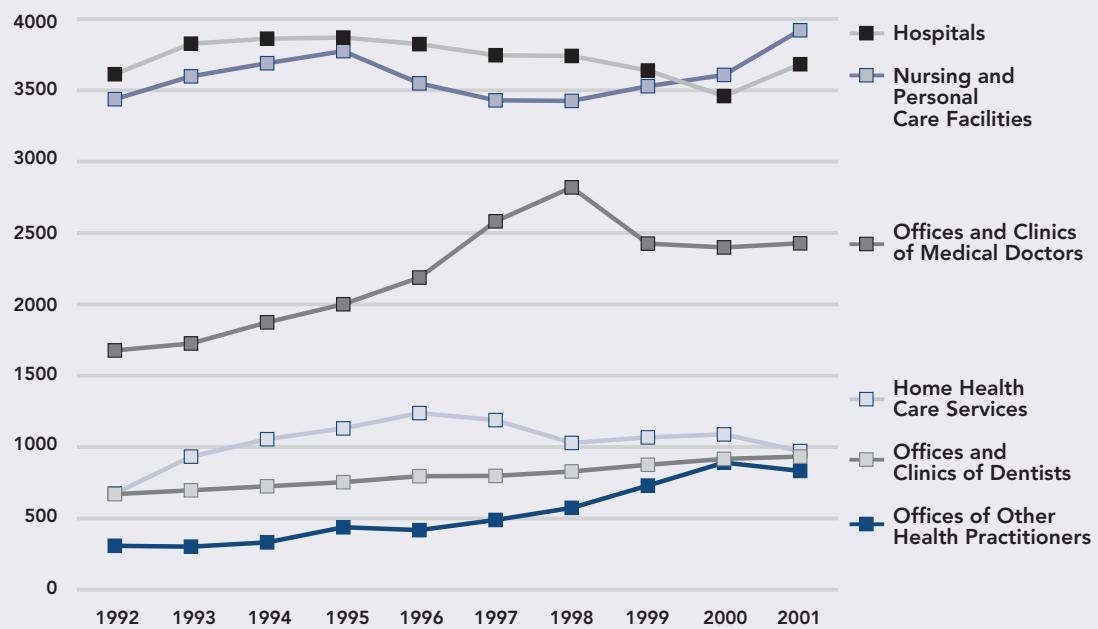


Source: Massachusetts Division of Employment Training ES-202 data.

Health Care industry than in any other industry, including Manufacturing, in the entire region. In March, 2003, there were 18,097 jobs in Durable Goods Manufacturing and 18,674 jobs in the Health Care and Social Assistance.² Employment in the healthcare industry is widely distributed across a number of sectors including hospitals, offices of medical doctors, home health care services, and nursing homes.

Hospitals were selected as the Health Care industry sector of focus for the Blueprint. As shown in Figure 4.2, hospitals had the highest level of Health Care employment in the Merrimack Valley in 2001.³ In 2003 according to the North American Industrial Classification System (NAICS) classification system, there were a total of 614 firms in the healthcare industry in the Merrimack Valley. In the hospital sector, a total of 4,702 people were employed in March, 2003.⁴ Hospital employment was one of the few industry sectors in the Merrimack Valley region that continued to grow from the

**FIGURE 4.2 MERRIMACK VALLEY EMPLOYMENT
IN HEALTH CARE SECTORS: 1992-2001**



Source: Massachusetts Division of Employment Training ES-202 data.

1990s through 2003.

The hospital sector, and Health Care generally, are an important supporter of economic development in any region. Health care is an important part of quality of life for the Merrimack Valley and any other region. When the healthcare environment in a region is strong and technologically advanced, workers in a variety of industries are likely to be attracted to the region.

One of the singular features of the Health Care industry in general and the hospital sector in particular is the diversity of employment that is offered. While the common image of occupations in the Health Care industry includes nursing,

physicians and other direct care providers, a large number of technologically skilled positions exist within the industry. Many of these jobs are behind-the-scenes that require certification or Associates Degree level training to access. Examples of these jobs include radiological technicians, X-ray technicians, and computer network professionals.

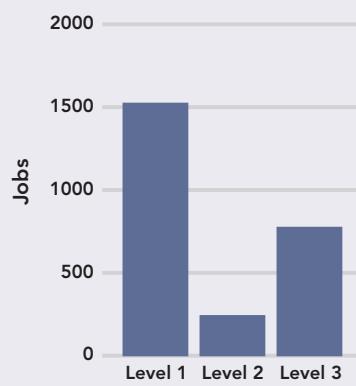
Virtually every component of the healthcare environment now requires workers to not only have good skills in working with people but also to have skills in working with technology. For example, medical records billing in most healthcare firms is no longer done by hand. It now is done on a computerized basis providing an additional skilled occupational category that did not previously exist at the same level. The growth of technology and technological based improvements in the healthcare environment has created a number of new opportunities for employment and training programs to participate in developing people for good jobs that are available in the Health Care industry.

From a workforce development perspective, the number of positions that require a licensing or recognized credentials without requiring a Bachelor's degree or above in this industry is a major advantage. These requirements give training providers and workers seeking to advance clear information on what the requirements are for moving to a specific job. Furthermore, there are a number of best practice examples of training programs that have used these requirements to develop career ladders training programs that have met the needs of workers and firms in the Health Care industry.⁵

Geographic Clusters

The Health Care environment is evenly distributed across the entire region. Employers in the Health Care industry exist in every city, each one of the fifteen municipalities that make up the Merrimack Valley. This provides an excellent opportunity for workforce development programs to participate with the Health Care industry and provides employment opportunities for workers close to their homes.

FIGURE 4.3 MERRIMACK VALLEY HOSPITAL SECTOR EMPLOYMENT BY LEVELS: 2002



Source: Massachusetts Division of Employment Training ES-202 data. Analysis by the author.

Employment Growth

Employment in the Health Care industry in the Merrimack Valley grew by 21.85% between 1992 and 2001. Growth was lowest in the largest industry sectors, hospitals (14.05%) and nursing homes and other personal care facilities (1.49%). Employment growth was largest in medical offices (44.78%) and home health care services (44.21%).⁶ Overall, the Health Care industry and the hospital sector are strongly representative of the criteria for a critical industry: high levels of employment and good but not dramatic employment growth over a ten year period.

Employment by Level

The hospital sector offers both opportunities and challenges for career ladders development. Fifty-four (54) percent of employment in the hospital sector is in jobs that do not require a Bachelor's degree or above in formal education.⁷ As shown in Figure 4.3 there are jobs across each of the three levels that do not require a bachelor's degree to attain.

However, the number of Level One jobs is significantly higher than the number of jobs available at Level Two. While there are more jobs available at the third level, the fact that there is such a gulf between Level One and Level Three with relatively few opportunities to bridge that gulf makes it difficult to develop career ladders that will sustain a worker while they get the additional education and certification required to move from Level One to Level Three. A bridge of Level Two jobs that would be helpful in the development of career ladders program is relatively modest. However, there are a number of best practice examples of career ladder development in the hospital sector that have found ways of maneuvering around the relatively small number of Level Two jobs. If sufficient resources are brought to bear that both offer training and the support required for workers at Level One jobs in the hospital sector to advance there is hope for optimism that career ladder programs can be developed. The really good news is that Level Three jobs in the hospital sector offer wages that approach the requirements for family self-sufficiency in the Merrimack Valley (see Appendix A).

Key Occupations

There are a large number of occupations that are available to workers in the hospital sector. Employers we interviewed in the hospital sector had individual occupations that were of most critical interest to each of them. However, certain themes did begin to emerge across the employers that were interviewed. The occupations described below were determined as key occupations that required less than a bachelor's degree in formal education, that have potential career ladders associated with them, and that arose in more than one employer during our interviews.

The entry level positions are listed here in order of demand: Patient Care Aids (or C.N.A. – certified nurses aid); Dietary Aids and Medical Records Technicians. These three categories allow for career migration paths in obvious ways or as simple places to begin for employment. All of these positions have low to moderate turnover in the current economic market per the interviews and represent between 5% and 10% of hires done in the month of August in the companies that participated.

Patient Care Aid (PCA)

Duties: Dressing, cleaning, and feeding patients; taking vital signs (EKG, temperature, etc.) and drawing blood.

Critical degrees, credentials, skills. Certified Nursing Assistant (CNA) Certificate; fluency in English; strong interpersonal skills.

Wages: Varied across businesses. Range from \$11.00 - \$15.00/hour.

Benefits: Full medical and insurance benefits generally offered. Sometime retirement programs are offered to workers after being with the business for a period of time as well. Differs by business.

Career Pathways: PCA ► Licensed Practical Nurse (LPN) ► Registered Nurse (RN)

PCA ► Medical Technician ► Medical Technologist

PCA ► Surgical Orderly ► Surgical Technician

PCA ► Receptionist ► Medical Records Clerks

Requirements for Advancement: For LPN, RN, Medical Technician, and Medical Technologist, two year or four year degrees must be obtained.

Projected Demand: The Bureau of Labor Statistics projects that Health Care occupations will grow substantially through 2010, fueled by both new jobs, driven by the aging of the population of the country, and by replacement jobs, driven by the aging of the health care workforce. Opportunities for workers with the necessary skills and certifications to obtain jobs in this industry will be substantial.

Medical Records

Those workers that choose office work in the healthcare industry often start in billing or transcription jobs which are grouped here as medical records. These workers must demonstrate basic computer and communication skills and mastery of basic medical terms. Transcriptionists may require skills equivalent to those acquired in an associates degree in business.

Duties: Using computer, including general word processing functions as well as specially designed programs for medical billing. Some receptionist and secretarial functions may be included for entry-level positions. Staff and patient communication.

Critical degrees, credentials, skills: High school diploma or GED. Must have good communications and problem-solving skills. Workers must be detail oriented and extremely accurate.

Wages: \$11.00 - \$15.00/hour

Benefits: See above.

Career Pathways: Receptionists ► Medical Records Clerk ► Coder

Medical Records ► Transcriptionist

Medical Records ► Supervisor ► Office Manager

Medical Records Clerk ► Licensed Medical Records Technician

Requirements for Advancement: Certification, up to two years of certificate or degree program leading to state licensing.

Projected Demand: Strong projected demand in medical records positions.

Dietary Aid

Duties: Kitchen/Cafeteria preparation and clean up work

Critical degrees, credentials, skills: High school diploma or GED. Requires good communications and teamwork skills. Most training provided on the job.

Wages: \$8.00 - \$12.00/hour

Benefits: See above.

Career Pathways: Dietary aid ► Dietician

Dietary aid ► PCA

Dietary aid ► Medical records

Dietary aid ► Medical Technician

Dietary aid ► Cook

Requirements for Advancement: Certification, up to two years of licensing program or degree program.

Projected Demand: Demand is projected to grow at a relatively modest rate. Most available jobs will be replacement jobs rather than newly created positions.

Critical Human Resource Needs

The Health Care industry reports that recruitment through word of mouth/employee referrals and the internet are the two most effective methods of finding new workers. Although promotion from within is also an important recruitment method, it falls behind these other two methods as a means for attracting entry level workers. There are fewer difficulties finding entry level workers in the current labor market than in the past and those reported vary greatly. Some of the challenges noted include sala-

ry ranges, communication and interpersonal skills, and English language capability. Employers in the Health Care industry reported some human resource needs that were common across the industry, as well as some firm-specific issues. The cross industry human resource issues were primarily in the area of retention for professionals and specific technical skills needs. The terms "job hopping," "H.R. empowerment," and "work loads" were cited as obstacles or challenges. There was a critical shortage of nurses described by many employers. In addition, workers with the skills and certifications for technical jobs such as radiology, MRI, mammography, and X-ray technicians were difficult to find.

The issue of a current and worsening shortage of nurses is a major one for the industry, which all of the businesses interviewed spoke about. Currently, there are fewer available nurses than the Health Care industry requires. Furthermore, the nursing population is getting older and there are fewer new nurses entering the field than will be required to meet future needs. Many nurses have been leaving direct care nursing positions and opting for supervisory positions or career changes. There are also an insufficient number of nursing faculty at colleges and universities even if there were more people interested in training for nursing careers. This potential crisis is compounded by the fact that the population is aging and will require additional health services in the future. Overall, the potential shortages of nurses is a critical issue for industry to address.

Finally, the Health Care industry is facing shortages of technically skilled workers in a variety of areas. There is a strong demand for qualified and certified or licensed workers to fill technician positions. The greatest obstacle in meeting the demand for these positions is that the required training can take up to two years and it is difficult for entry-level workers to advance in the industry without these certifications. Other industries that compete with Health Care for workers can offer career ladders with more accessible rungs that require shorter-term training for workers to obtain at least some wage increases.

Conclusion

The Health Care industry, and the hospital sector in particular, have current engagement with the MVWIB and region's workforce development system. The results of the Blueprint interviews appears to indicate that expanded engagement and training efforts in this industry are warranted. There is strong demand for workers with identified skills, licensing, and certification. Wages and growth potential in the industry are strong and there are a number of training providers in the regional training system that are experienced in working with this industry.

CONSTRUCTION

The Construction industry is comprised, broadly speaking, of businesses that specialize in one or more aspect of construction, repair or maintenance. Construction firms range from plumbing, heating and air conditioning companies, to those which do roofing, painting and carpentry, and other Construction firms that work on roads and other major building projects. On some projects firms work independently and on others they work as subcontractors who are hired by a general contractor. Much of the work done by firms in the Merrimack Valley region may actually occur outside of the region with much of the work focused on Greater Boston projects, such as the Big Dig and large commercial development.

The sector of focus for the Blueprint in the Construction industry is Special Trades Contractors. Special Trades Contractors include most of the traditional trades firms including plumbing, heating and air conditioning, painting and paper hanging, electrical work and carpentry and roofing. This sector is the largest and fastest growing sector of the Construction industry in the Merrimack Valley region.

One of the main benefits of the Construction industry is the potential it has for employing workers who do not have a bachelor's degree or above in formal edu-

cation in jobs that offer high paying wages. Many of the firms in the Construction industry in the Merrimack Valley region participate in employment through unions. Others are required to pay at the same level when they work on publicly funded construction projects. With the decline in manufacturing employment, these jobs offer some of the best paying options in the "blue collar" realm that are currently available in an industry that is growing in region. Another benefit of the Construction industry is the extent to which entrepreneurship is taken as a natural course of evolution. The line between employers and employees sometimes blur as craft workers such as electricians and plumbers leave the ranks of employees to establish their own independent contracting businesses.

One feature that distinguishes work in the Construction industry is its contingent projects specific nature. Trades workers only work until the completion of their current project. Once the project is completed workers are forced to seek additional employment.

Trades work in the region is highly cyclical reflecting the ups and downs of private real estate investment as well as public expenditures on the large public projects that are more well known. In addition, there is work in the private sector, not only for construction of private real estate, but also, when the market turns down for new real estate construction, there is also work for available for remodeling and repair and refurbishment to private homes.

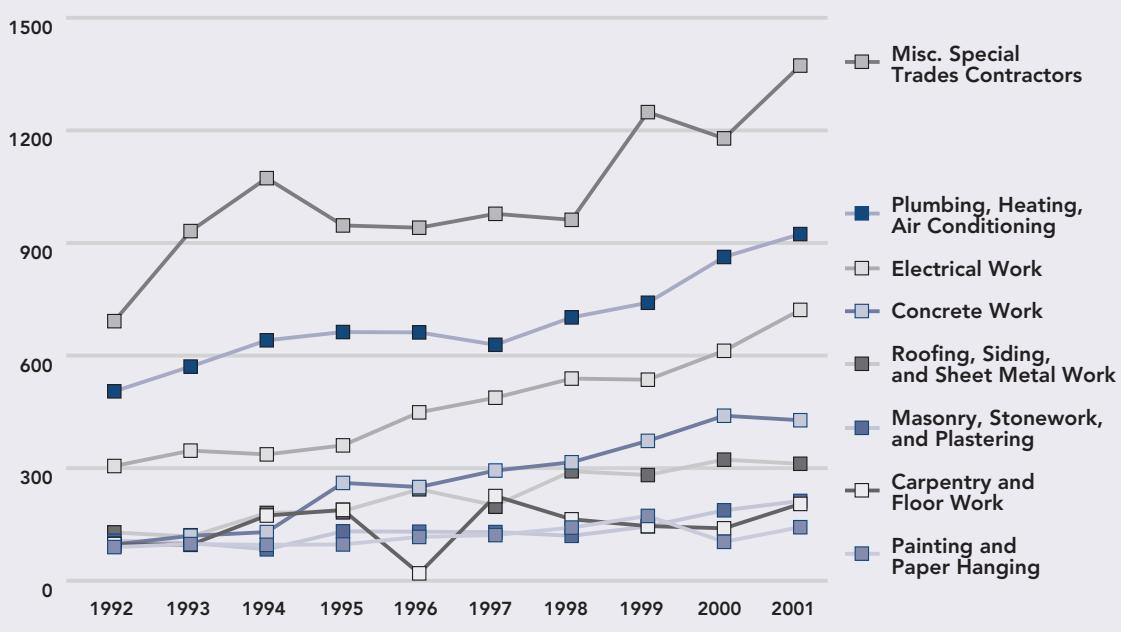
Geographic Clusters

The Construction industry is distributed throughout the Merrimack Valley region. Interestingly, employment of Lawrence residents in the Construction industry trails the overall region and the state quite considerably.⁸ This suggests an opportunity for residents of Lawrence to access good-paying construction jobs, if the appropriate training and industry partners can be identified.

Employment Growth

Employment in the construction industry in the Merrimack Valley region has grown between 1992 and 2001.

**FIGURE 4.4 MERRIMACK VALLEY EMPLOYMENT
IN SPECIAL TRADES CONTRACTORS SUB-SECTORS: 1992-2001**

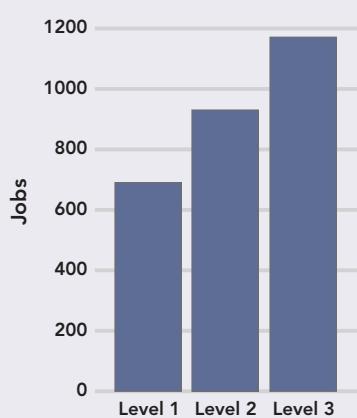


Source: Massachusetts Division of Employment Training ES-202 data.

However, on a percentage basis, the number of employees in the Construction industry in the Merrimack Valley continues to trail the percentage in surrounding regions and statewide in Massachusetts. In March, 2003, 3,466 employees worked in the Special Trades Contractors sector of Construction in the Merrimack Valley being employed in 524 firms.⁹

Employment growth in the Special Trades Contractors sub-sectors (Figure 4.4) ranged between 75% and over 400% between 1992 and 2001. The largest sub-sectors were Plumbing, Heating,

FIGURE 4.5 MERRIMACK VALLEY SPECIAL TRADE CONTRACTORS EMPLOYMENT BY LEVELS: 2002



Source: Massachusetts Division of Employment Training ES-202 data. Analysis by the author.

and Air Conditioning (904 workers, 86.39% growth) and Electrical Work (702 workers, 145.45% growth).¹⁰

Employment by Levels

The special trades contractor sector of the Construction industry offers substantial opportunities for career ladder development. More than 80% of the jobs in the Special Trades Contractor sector of the Construction industry do not require a Bachelor's degree or above in formal education. At each of the three pre-baccalaureate levels, there are increasing number of jobs available.

Approximately 25% of the jobs that do not require a bachelor's degree in formal education are in the first level. Approximately 33% of the jobs in Special Trades Contractors are in Level Two with the remainder, 41.9%, in Level Three. This offers the option for workers who enter at the lowest entry level to go through the formal processes of apprenticeship, leading to employment as a journey person, and then moving up to a master in their specific trade. For example, an apprentice electrician could move up to through the ranks to become a master electrician and gain employment with commensurate increases in wages as a person moves through the levels. Career ladders in this industry do not have to be developed separately. The career ladders are of such long standing nature and due primarily to unionization in the industry that they are taken for granted and institutionalized within the occupational structure of the industry. Furthermore, there are strong models of program development that can help people access apprenticeship training and then begin to move through to the good paying jobs that are available at the third level.

Key Occupations

Electricians

Duties: Install and repair electrical systems. Electrical work increasing requires working on communications systems as well.

Critical credentials, skills, and education: State licensing requirements govern this occupation. High school diploma or GED with strong math skills generally required to enter apprenticeship programs. Licensing requires five or more years of apprenticeship and 1,000 hours of classroom training.

Wages: Union prevailing wages are over \$30 per hour, with apprentices starting at 30% of that wage. In non-union firms, wages are negotiated with individual owners.

Benefits: Businesses generally offer full benefit packages although for smaller firms the cost of health insurance is a major concern.

Career Pathways: Apprentice electrician ► journeyman electrician ► master electrician ► foreman ► general foreman

Projected Demand: Projected growth rate for this occupation is relatively modest, although there will be a number of replacement jobs available as the construction workforce ages.

Laborers

Duties: Move materials by hand, assist trades workers, provide site clean-up.

Critical credentials, skills, and education: No academic credential is required.

Physical fitness is required. Need to be able to follow detailed directions, work safely, and have good communications skills. Need to be able to take direction. More skills and education are required to progress into an apprenticeship program in one of the trades.

Wages: Extremely variable, depending upon whether the position is union or non-union, and on the specific employer.

Benefits: Businesses generally offer full benefit packages for permanent full-time workers.

Career Pathways: Laborers seeking to advance general go on to an apprenticeship in one of the trades.

Projected Demand: Projected growth rate for this occupation is low, although there will be some replacement jobs available as the construction workforce ages.

Carpenters

Duties: Frame, construct, repair, and remodel buildings. Rough out frames for dry walling. Foremen and master carpenters read blueprints and oversee the layout and construction of jobs.

Critical credentials, skills, and education: Apprenticeship programs generally require a high school diploma or GED and successful completion of an aptitude test for entrance. To attain journeyman carpenter status, four years of apprenticeship, including classroom training and on the job work under the supervision of a master or journeyman carpenter are required.

Wages: \$25 per hour and above for union journeyman carpenters. Apprentices start at 40% of the journeyman rate. In non-union shops, there is a wide variation of wages.

Benefits: Businesses generally offer full benefit packages for permanent full-time workers.

Career Pathways: Apprentice carpenter ► journeyman carpenter ► foreman

Projected Demand: Projected growth rate for this occupation is low, although there will be some replacement jobs available as the construction workforce ages.

Critical Human Resource Needs

The most critical human resource need that businesses in the Construction industry identified was the need for students with sufficient preparation to enter apprenticeships and other entry-level positions in the industry. General academic preparation, particularly math skills, was cited as being a major barrier for entry into the industry. Also, fewer students have been coming out of the region's vocational-technical schools and entering the Construction industry than in years past. If not addressed, this will be an increasing problem due to the aging of the construction workforce.

Conclusion

Businesses in the Construction industry see the public perception of their industry and the jobs within it as an important issue. Many potential workers fail to recognize the ways in which the industry has evolved and become more reliant on technical skills and less reliant on solely hand labor and fabrication. This perception has extended to the K-12 educational system where businesses believe that construction jobs are not portrayed in the positive light that they should be given the opportunities for good jobs at good wages for workers with less than a college degree.

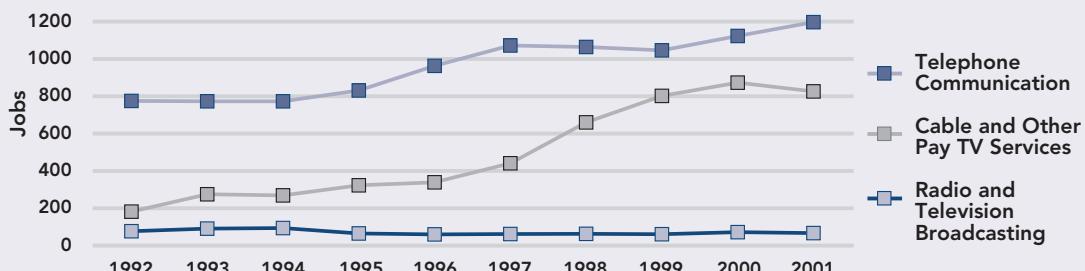
People also fail to either enter or stay in the Construction industry in the Merrimack Valley region due to the transient nature of employment in Construction. Some businesses reported that workers are leaving the area to go to Sunbelt states that are perceived as growing faster than Massachusetts and the Northeast. Given the room for growth of the Construction industry in the Merrimack Valley and the strong wages and career ladders opportunities in the industry, it is important that the MVWIB works with businesses and training providers to develop programs serving this industry.

COMMUNICATIONS

The Communications industry has evolved from a traditional provider of telephone and television services to an industry that provides consumers with the means to move and receive information.¹¹ Many of the jobs in this industry are high-tech and require both significant levels of technical training and the ability to readily accept additional training as technologies shift. The dramatic expansion of cable TV services has also helped drive the development of this industry.

There has been significant convergence in the Communications industry. Telephone

FIGURE 4.6 MERRIMACK VALLEY EMPLOYMENT IN COMMUNICATIONS SECTORS: 1992-2001



Source: Massachusetts Division of Employment Training ES-202 data.

companies are extensively providing both businesses and individual consumers with data services and internet connectivity. The rollout of broadband internet connectivity has been especially popular. Telephone Communications firms have acquired or outcompeted a number of independent providers of these services. Cable TV providers are also providers of broadband connectivity to individual consumers.

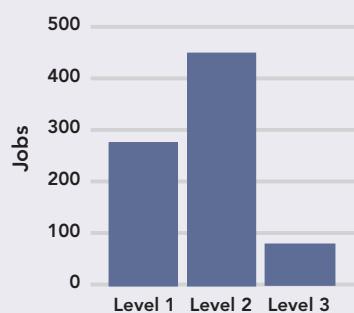
A number of smaller businesses in the Merrimack Valley region and across the state have gone out of business over the past ten years and their functions, although not always their workers, have been subsumed into larger firms in the industry.

There are two large sectors of the Communications industry in the Merrimack Valley region. As shown in Figure 4.6, both the Telephone Communication and the Cable and Other Pay TV Services sectors have significant levels of employment and so both sectors will be included in this analysis. In 2001,¹² 1,197 people were employed in Telephone Communication and 826 people were employed in Cable TV in the Merrimack Valley.¹³

From an economic development perspective, the Communication industry relies upon the growth of the population and the businesses in the Merrimack Valley region. The Communication industry is a supporter of economic development efforts across a number of industries. For example, many industries now require high speed connectivity to the internet. As additional areas gain fiber optics lcablings, businesses requiring high-speed interent access may be more likely to be recruited to the region.

From a workforce development perspective, the Communications industry offers a number of excellent opportunities. In the telephone communication sector, there are high levels of unionization, which has driven good wages, the retention of jobs in the region, and the development of career ladders training opportunities. In the Cable TV sector, there is rapid employment growth and new job creation. However, there is also little unionization and a high degree of outsourcing in this sector, making it more difficult for the workforce development system to identify appropriate partners with whom to engage. In both sectors, many of the jobs have high levels of technical skills requirements which can form the basis for the development of training programs.

FIGURE 4.7 MERRIMACK VALLEY EMPLOYMENT IN TELEPHONE COMMUNICATIONS BY LEVELS: 2001



Source: Massachusetts Division of Employment Training ES-202 data. Analysis by the author.

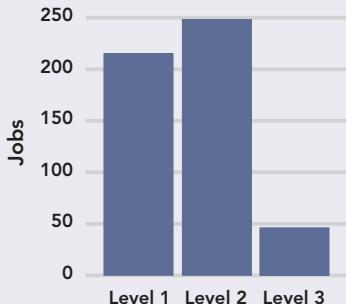
Geographic Clusters

There is relatively little geographic clustering in this industry. Firms are spread across the region and, more importantly, the work that is done by this industry is also quite dispersed across the industry. Also, because so much of the employment in the Cable TV sector is outsourced, employment is even more dispersed.

Employment Growth

Employment in Telephone Communication grew by 54.45% between 1992 and 2001 while employment in the Cable TV sector grew by more than 300% over the same time frame. The Cable TV sector has experienced much more rapid growth over time, as befits an emerging industry with new demand. However, employment in telephone communication grew more quickly from 2000 to 2001, indication the potential for the Telephone Communication sector to grow in the future.

**FIGURE 4.8 MERRIMACK VALLEY
CABLE AND OTHER PAY TV
EMPLOYMENT BY LEVELS: 2001**



Source: Massachusetts Division of Employment Training ES-202 data. Analysis by the author.

Employment by Levels

A significant proportion of jobs in both Communications sectors are available to workers with less than a Bachelor's degree in formal education. The Telephone Communication sector has 67.4% of employment in pre-baccalaureate positions, while the Cable TV sector's rate is 61.6%.

The percentage of Level One and Level Two jobs in this sector suggests that there are opportunities for the development of career ladders training programs. However, the relatively small number of Level Three jobs suggests that growth opportunities in the industry may be truncated. Offsetting this issue to some extent is the fact that technician jobs in this sector pay good wages, better than a number of Level Three jobs in other industries.

In the Cable TV sector, there is a higher percentage of employment at the first level. In the second and third levels, the profiles are much the same as for the telephone communication sector.

Key Occupations

Installer/Repair Technician

Duties: Install telephone, cable TV, broadband internet connections, and other data services. Job often requires working outdoors and in homes of customers, climbing ladders and working in tight spaces. Repair positions troubleshoot customer-identified issues and provide the necessary repairs.

Critical credentials, skills, and education: Practical education including safety issues and following detailed installation process protocols. Need to pass an initial aptitude examination at many companies, followed by on-the-job training and/or union sponsored apprenticeships.

Wages: \$10-\$13 per hour. Very experienced and certified installers can make more.

Benefits: Businesses in this industry generally offer full benefits, including health care, insurance, and, in some cases, pensions or profit-sharing programs.

Career Pathways: Installer ► repair technician ► preventive maintenance technician

Installer ► technician ► supervisor

Projected Demand: Projected growth rate for this occupation is modest.

Customer Service Representative

Duties: Respond to customer information requests and complaints. Route queries to appropriate areas. Record information on computer systems.

Critical credentials, skills, and education: Excellent English language spoken communication skills. Bi-lingual is often a strong plus. Strong customer service and interpersonal skills. In call centers, customer service representatives must have strong computer skills. For firms where customer service representatives provide low-level technical support, certification from industry vendors is often required.

Wages: Vary widely between \$8 and \$13 per hour.

Benefits: Businesses generally offer full benefit packages.

Career Pathways: CSR ► shift supervisor ► manager

CSR ► technical support ► supervisor

Projected Demand: Projected growth rate for this occupation is strong.

Critical Human Resource Issues

The largest human resource issue was the lack of sufficient technical skills. In part because the industry is so new, particularly the Cable TV sector, there is not a readily available pool of workers with currently required technical skills. Workers in this industry must be adaptable and able to receive frequent training as technologies change. Training providers that serve this industry must also demonstrate the same level of flexibility to provide training for new skills and technologies on a regular basis. Businesses interviewed for the Blueprint cited a lack of such providers in the

region. While there are several organizations that were cited as excellent examples of technical training providers, businesses felt there were too few skilled training providers in the region to meet the demand for workers.

Another human resource issue for the Communications industry is the transition from tradition, vertical career ladders to horizontal career ladders and career lattices. With the rapid change in the industry and a requirement for a wider variety of skills among technicians and repairers, there is less room for the spreading of tasks among a variety of occupations with clear and trainable steps between each level. These steps help make the development of career ladders training programs possible. Without them, the MVWIB and training providers working in this industry will have to be more flexible in working with small groups of businesses to identify specific needs and develop training curricula to meet those needs.

Conclusion

The Communications industry is strong and growing in the Merrimack Valley. A number of employment opportunities exist in this industry now and many more are projected for the future. However, industry representatives in the region have identified the lack of sufficient technical training as an issue. It is imperative that the MVWIB and its training providers increase their ability to work effectively with this growing industry.

ENDNOTES

1 For a description of the employment by levels methodology, see Chapter 3.

2 Source: Massachusetts Division of Employment Training ES-202 data.

3 The conversion of employment data systems from Standard Industrial Classification (SIC) codes to the North American Industrial Classification System (NAICS) makes it impossible to accurately compare data in the various Health Care sectors between 2001 and 2002.

4 Source: Massachusetts Division of Employment Training ES-202 data.

5 See Randall Wilson, *Climbing the Career Ladder: Opportunities in Greater Boston's Health Services Industry and Career Ladder Strategies in the Long-Term Care Industry: Promising Practices*. Boston, MA: Boston Workforce Development Coalition and Center for Community Economic Development, 2001.

6 Source: Massachusetts Division of Employment Training ES-202 data.

7 Calculations are the author's based on occupational matrix data from the Massachusetts Division of Employment Training.

8 Source: US Census Bureau 2000 Census of Population and Housing.

9 Source: Massachusetts Division of Employment Training ES-202 data. Please note that in the transition to the NAICS data classification system, the official name of the sector was changed from "Special Trades Contractors" to "Specialty Trade Contractors."

10 Source: Massachusetts Division of Employment Training ES-202 data.

11 See O. Steven Quimby, *Career Ladder Strategies in the Telecommunications Industry: Best Practices and Recommendations*. Boston, MA: Boston Workforce Development Coalition, 2001; and Randall Wilson, *Climbing the Career Ladder: Opportunities in Greater Boston's Telecommunication Industry*. Boston, MA: Boston Workforce Development Coalition, 2001.

12 The change from SIC to NAICS it impossible to compare Telephone Communications employment from 2001 to current data.

13 Source: Massachusetts Division of Employment Training ES-202 data.

Chapter 5. Manufacturing

T

he Merrimack Valley Region has an identity as a manufacturing region. From textiles and shoes in the early part of the twentieth century to computers and telecommunications products, a large portion of the industries workforce has long been employed in some form of manufacturing. Currently

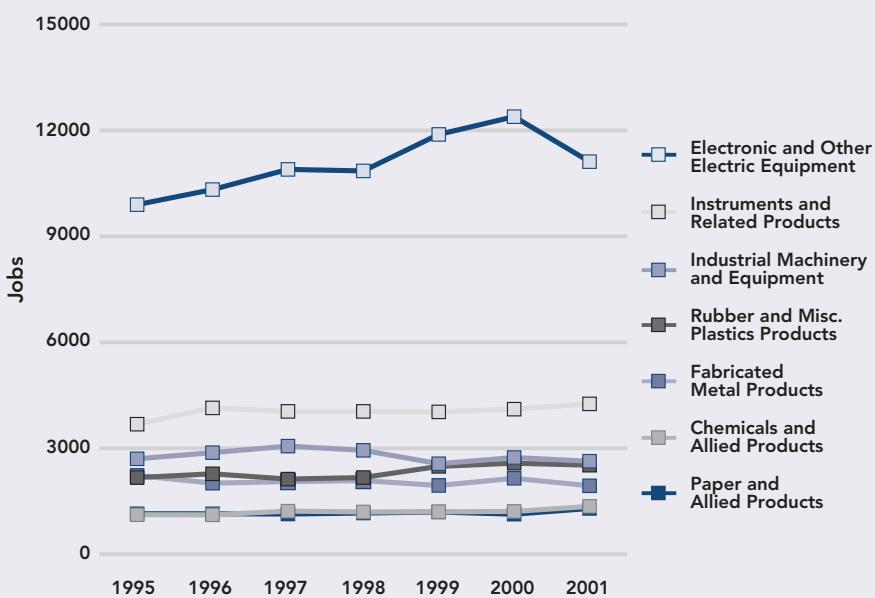
Manufacturing is seen as being in a crisis, yet a significant portion of the region's residents are still employed in this industry.¹ While both the number of Manufacturing businesses and the number of employees has declined significantly since 2000, Manufacturing will continue to be an important employer in the region for the foreseeable future. Therefore, the Manufacturing industry merits important attention from the Merrimack Valley Workforce Investment Board (MVWIB) and the Blueprint.

In this chapter we provide a brief overview of the history of Manufacturing in the Merrimack Valley. Particular attention will be paid to the training programs that firms in the manufacturing industry developed over time that supported the region's workforce. Finally, an analysis of current and future Manufacturing opportunities in sectors of the manufacturing industry that are growing and are likely to continue to grow in the future is provided, with a particular focus on the Instruments Manufacturing sector.

HISTORY OF MANUFACTURING THE MERRIMACK VALLEY REGION

Manufacturing in the Merrimack Valley can be traced back to the development of manufacturing firms in the region's major cities including Lawrence, Haverhill, and Amesbury building on the physical assets of the region, particularly the Merrimack River. The original manufacturing clusters in the region were dedicated to textiles, apparel, and shoe production. These clusters remained strong through the first third of the twentieth century. However, as steam power and electricity displaced the need for the Merrimack River's power generation capacity as a competitive advantage, the region lost its ability to compete with other areas of the country, particularly the south, in textiles and clothing manufacturing.

FIGURE 5.1 MERRIMACK VALLEY EMPLOYMENT IN MANUFACTURING SECTORS: 1995-2001



Source: Massachusetts Division of Employment Training ES-202 data.

In the 1960's, employment in the region was stagnating due to loss of competitive advantage in the previously dominate manufacturing sectors of textiles and clothing. As the interstate system developed in the Merrimack Valley region, a new cluster developed in defense manufacturing. Defense manufacturing in the region was, and is today, anchored by Raytheon with a number of smaller contractors in the surrounding area feeding into Raytheon and other firms in the cluster. The defense cluster has declined since the late 1980's but is still an important factor in the Merrimack Valley region and may emerge again as part of the new emphasis on homeland security.

The next manufacturing cluster to develop in the Merrimack Valley region was mini-computers. The development of this cluster was driven in part by the defense manufacturing cluster which was an early adopter of computer applications and in part by the region's proximity to the universities of the greater Boston area which

were leaders in the development of the mini-computer. It was the development of the mini-computer cluster that labeled the Merrimack Valley region as one of the main high tech regions in the country. After a period of time, where firms including Digital Equipment Corporation, Wang and Prime Computer led the way in computers nationwide, the region entered another period of stagnation when the personal computer gained supremacy over mini-computers and the Merrimack Valley region trailed other areas of the country in the development of the PC.² The most recent manufacturing leader in the Merrimack Valley has been telecommunications.

Through the late 90's and early 2000's the Merrimack Valley was one of the leading locations in the entire world for the manufacturing of high tech telecom equipment. Technology leaders including CISCO Systems, Unisphere Networks, and, most importantly, A.T. & T. and Lucent Technologies provided significant employment in the region. However, in 2001-2002 there was a dramatic downturn in the global demand for telecommunications equipment leading to substantial displacement of workers from a number of these firms. Even in firms such as CISCO Systems, where there has recently been some rehiring of workers, most new hires are brought on through temporary agencies, contract manufacturers, or on temp-to-perm basis which indicates that employment in this industry may not come back on a permanent and substantial basis for some time to come.

MERRIMACK VALLEY WORKS

The Merrimack Valley Works, Western Electric, then AT&T, and finally Lucent Technologies plant, is the most critical manufacturing facility in the region. The Valley Works facility comprises more than one million square feet of state-of-the-art manufacturing space. At one time, the Merrimack Valley Works employed more than 10,000 people in three shifts, often working six or seven days per week in busy periods.

Originally, the Merrimack Valley Works manufactured every component of the equipment that they were selling. This even extended down to making the nuts, bolts and screws to hold together electrical equipment components.³ As the Valley Works began to out-source some of its component production, it led to the development of a cluster of smaller manufacturing firms in the region that supplied the equipment component needs of the Merrimack Valley Works. The development of this cluster has been historically important in the Merrimack Valley region in terms of both providing employment and economic growth for the region. It also provided additional training opportunities for manufacturing and career ladders that workers could use to gain access to higher wages through gaining additional skills and education.

With the decline of Lucent Technologies' Merrimack Valley Works as a single employer of such a large number of workers, the impact has been felt among the entire cluster of manufacturing firms in the region. Since it is not likely that we will ever see a single manufacturing employer in the region with over 10,000 workers, it is also likely that the manufacturing cluster that fed into this industry in the past will have to evolve into a more globalized manufacturing cluster that will provide their own products nationwide and globally rather than feeding into a single, large manufacturer in the region.

In addition to its impact on development of a cluster the Merrimack Valley Works was also noted for the level of training that was provided by the company. During times of regular growth, Merrimack Valley Works sponsored a large amount of in-house company training on the use of new technologies for workers at all levels, from engineers and managers to line level production staff. During times of high labor scarcity the, Merrimack Valley Works pursued a "growing your own" strategy of training low-level production workers to be highly-skilled technical workers in occupations such as testers and tester analysts.⁴ In large part, it was this type of training that led to the development of the highly skilled manufacturing workforce

that is often touted as one of the Merrimack Valley's main economic and workforce development assets. With the decline in employment in the Merrimack Valley Works, it is an open question as to where this training will come from in the future. However, it is clear that the Merrimack Valley Workforce Investment Board and other elements of the workforce development system must ensure that training continues to be provided so that the manufacturing workforce of the region stays on the cutting edge of technology. To fail to do so would be to promote the loss of jobs from the region to other areas of the country and other areas of the world that are willing to invest in training their workforce.

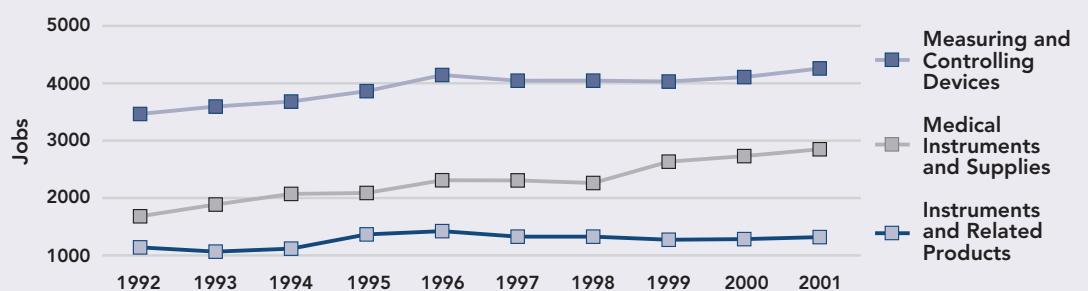
MEASURING AND CONTROLLING DEVICE MANUFACTURING

One of the main areas of continued manufacturing employment in the Merrimack Valley region is the Instruments and Related Products component of the Manufacturing industry. While this sector is not as large as the electronic equipment sector, it has continued grow, even in the face of the recent economic downturn, while the employment in the electronic equipment sector continues to decline quarter after quarter, even through 2003. This sector includes two sub-sectors, Measuring and Controlling

Devices, considered in this chapter, and Medical Instruments and Supplies Manufacturing, which is considered as an emerging industry in Chapter 6.

The selection of the measuring and controlling devices sector to focus the discussion of manufacturing around was based on two factors. First, it was one of the largest sub-sectors in the region, employing over 1,300 people in

FIGURE 5.2 MERRIMACK VALLEY INSTRUMENT MANUFACTURING EMPLOYMENT: 1992-2001



Source: Massachusetts Division of Employment Training ES-202 data.

2001, which is quite large for an industry sub-sector.⁵ Second, the sector has continued to grow, albeit at a slower rate, through the economic downturn which gives some confidence that when the macro-economy recovers, this sector will be one of the leaders and employment will peak up.

From an economic development perspective, this industry is beneficial to the Merrimack Valley region for several reasons. First, there are a larger number of smaller firms in this manufacturing sector than in most others. Therefore, events impacting the employment at one or a few firms are unlikely to have a major impact on the entire region. In other words, working with this sector will not result in "putting all our eggs in one basket." Also, the firms in the sector have very specific supply needs, which may drive the development of other firms in the cluster in the Merrimack Valley. A group of firms, driven by the needs of multiple businesses in an industrial cluster is inherently better situated for the long run than a group of firms serving a single large business.

From a workforce development perspective, the Measuring and Controlling Device Manufacturing sector has a lot to recommend it as well. First, this sector has some of the highest skill requirements of any manufacturing sector, meaning it will need the skilled manufacturing workforce of the Merrimack Valley as demand and employment in the sector expand. Also, there are a number of pathways that workers can take to use training to get to higher level jobs. By engaging with interested businesses in this industry, the MVWIB can put its resources to good use to promote workforce and economic development for the region.

One potential downside to the current employment picture in the Manufacturing industry generally and this sector in particular is that most new hires are being done on a temp-to-perm basis. Since this phenomenon is relatively recent, it is not clear the extent to which companies will be converting these positions into full-time regular jobs with full benefits and career ladders options for future advancement. In the course of engagement with businesses in this industry, the MVWIB should ensure that businesses where workers who are trained with workforce development system dollars are converting workers to permanent status and providing upgrading opportunities to the maximum extent possible.

Geographic Clusters

There is little in the way of geographic clustering in the Manufacturing industry in general and the measuring and controlling devices in particular, in the Merrimack Valley. Firms are widely distributed throughout the entire region, providing accessible opportunities for residents of any municipality in the region.

Employment Growth

Between 1992 and 2001, employment in the measuring and controlling device sector in the Merrimack Valley grew by slightly more than 15%. This is not very strong employment growth, but it is considerably better than many other manufacturing sectors, which have seen their total employment decline over the same time period. Furthermore, employment has been relatively stable, which is quite an accomplishment for any manufacturing sector over the past ten years.

Employment by Levels

Fifty-two (52) percent of total employment in the measuring and controlling device manufacturing sector is in occupations that require less than a Bachelor's degree in formal education. The occupational profile of this industry shows a fairly even distribution of pre-baccalaureate jobs, with 37% in Level One, 23% in Level Two, and 40% in Level Three. Both the high number of level three jobs and the high proportion of jobs requiring a college degree demonstrate the high skill level that this sector requires. The skills, education, and experience of the Merrimack Valley Workforce are a strong match for this sector of the Manufacturing industry.

Key Occupations

Assembler

Duties: Assembles mechanical or electronic equipment, using hand tools, soldering equipment, and microscopes. Some assemblers also troubleshoot and repair components, although in some companies this is a separate occupation.

Critical degrees, credentials, skills: High school diploma or GED is often required, almost always preferred. Associates degree or industry certifications such as the J-standard certification for soldering are often required for more complex assembly positions.

Wages: \$12-\$13 per hour

Benefits: Permanent workers generally receive health insurance, with levels of employee contribution varying widely by company. Some companies offer additional benefits including dental, disability, profit sharing, and tuition reimbursement.

Career Pathways: Assembler ► Technician ► Inspector

Assembler ► Group leader ► Supervisor

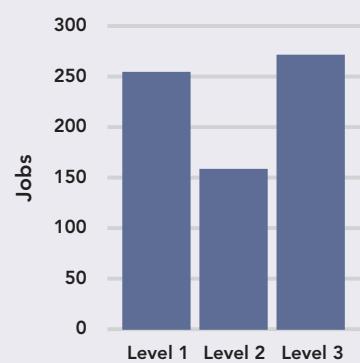
Requirements for Advancement: Demonstrated performance, company-sponsored training, industry certification, Associate's degree.

Projected Demand: Hand assembly positions are expected to grow slightly through 2008, while mechanical assembly positions are expected to decline slightly.⁶

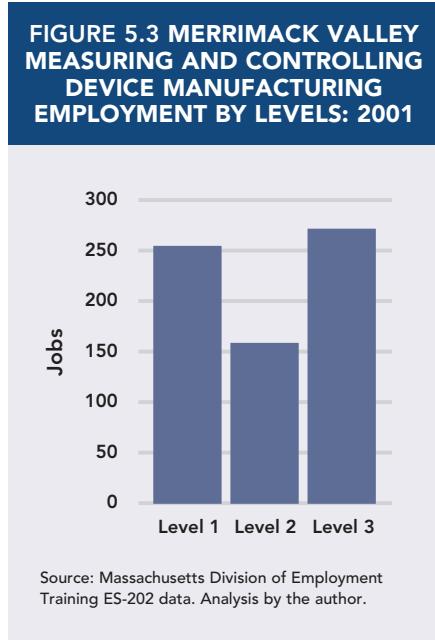
Machinists

Duties: Set up and operate a variety of machine tools. Read blueprints and follow

FIGURE 5.3 MERRIMACK VALLEY MEASURING AND CONTROLLING DEVICE MANUFACTURING EMPLOYMENT BY LEVELS: 2001



Source: Massachusetts Division of Employment Training ES-202 data. Analysis by the author.



detailed instructions to manufacture products, often to extremely narrow tolerances. Attention to detail and quality standards are critical.

Critical degrees, credentials, skills: Mechanical aptitude, specific machine experience, industry certification. Knowledge of shop mathematics is crucial. Increasingly uses computers and computerized processes to plan and carry out work.

Wages: \$15-\$21 per hour

Benefits: See above.

Career Pathways: Machinist is generally a top-end position. Some machinists may go into management or obtain Bachelor's degrees and move into programming positions.

Requirements for Advancement: Training and experience, Bachelor's degree for higher levels of advancement.

Projected Demand: Modest demand for the short-term due to industry conditions. Over the long-term, the aging of the workforce in this industry will create a substantial number of replacement jobs.

CNC and Other Machine Operators

Duties: Set up and operate numerical control (magnetic- or punched-tape- controlled) machine tools that automatically mill, drill, broach, and ream metal and plastic parts. May adjust machine feed and speed, change cutting tools, or adjust machine controls when automatic programming is faulty or if machine malfunctions.

Critical degrees, credentials, skills: Computer knowledge, specific machine knowledge and experience, industry certification.

Wages: \$14-23 per hour

Benefits: See above.

Career Pathways: Generally a top-end position. Advancement opportunities similar to those for machinists.

Requirements for Advancement: See above.

Projected Demand: Modest growth projected over the next five years. In the future, fewer of these positions will be available but the skills requirements will be higher. There are also likely to be a substantial number of replacement jobs available as the current workforce reaches retirement age.

Tool and Die Makers

Duties: Set up and operate machine and hand tools to make and repair dies, cutting tools, jigs, and fixtures.

Critical degrees, credentials, skills: Experience in the trade, learn by formal and informal apprenticeships with experienced craft workers.

Wages: \$14-\$25 per hour

Benefits: See above.

Career Pathways: Top-end craft work job. Many workers stay in these positions for years once they get there.

Requirements for Advancement: See above.

Projected Demand: Employment in this occupation is projected to decline over the next five years.

Critical Human Resource Needs

Despite the current economic downturn and the limited hiring occurring in manufacturing currently, businesses in the industry still identified a number of human resource needs, both current and going down the road. An important human resource issue is, as one business put it, "old experience for changing technology." The current manufacturing environment in the Merrimack Valley is high skilled and rapidly changing. Workers in this industry can no longer learn a specific set of skills and use those skills for an entire career. As product cycles are speeding up, so is the need to adapt to new manufacturing technologies and processes. Workers who

cannot adapt and take on new training quickly will not be successful manufacturing workers in the future.

Another critical human resource issue is the aging of the manufacturing workforce and the fact that relatively few young people are interested in entering the industry. This phenomenon is one that is impacting the entire industry, nationwide.⁷ While there are relatively few manufacturing jobs available now, there will be jobs available in the future due to both job creation, due to increased demand for products, and due to retirements in the current labor force. However, assisted by the perception that the Manufacturing industry is dying and there are no good jobs there, businesses are likely to have trouble attracting the workers they need as these openings occur. The MVWIB should attempt to both publicize and target training money to the technically-skilled occupations identified by businesses in the industry as having openings in the future.

Finally, the internal development of workers for next-generation manufacturing jobs is seen as a challenge to the industry. With the decline in basic manufacturing jobs, both through automation and through loss of manufacturing to overseas locations, there is less demand for many lower-skilled jobs. At the same time, the jobs that are remaining in the Merrimack Valley with good opportunities for future growth are those which have higher skill requirements. The development of internal workers to access such jobs has been hampered by the lack of sufficient basic skills among many production workers. Math skills are particularly important and in short supply.

CONCLUSION

The Manufacturing industry has been an important part of the employment picture in the Merrimack Valley for the past century and is likely to remain important for the foreseeable future. The changing requirements of the industry, however, will place new demands on the workforce development system and residents of the region. Although the current downturn has made it difficult for the workforce development system to develop appropriate linkages with this industry, it will be an important industry for the future.

ENDNOTES

1 In March, 2003, 27,566 people were employed in manufacturing with 18,097 in Durable Goods Manufacturing. Massachusetts Division of Employment Training ES-202 data.

2 Source: Merrimack Valley Planning Commission, *Comprehensive Economic Development Strategy*, 2003, p. 1.

3 William Lazonick, Michael Fiddy, and O. Steven Quimby. "'Grow Your Own' in the New Economy?: Skill-Formation Challenges in the New England Optical Networking Industry." In *Globalization, Universities, and Sustainable Development*, Robert Forrant and Jean Pyle, eds. London, UK: Elgar Publishing, 2002.

4 Ibid.

5 Source: Massachusetts Division of Employment Training ES-202 data.

6 Source: Massachusetts Division of Employment Training, *Massachusetts Occupation Employment Projections: 1998-2008*.

7 National Association of Manufacturers, The Manufacturing Institute, and Deloitte & Touche, *Keeping America Competitive: How a Talent Shortage Threatens U.S. Manufacturing*, 2003.

Chapter 6. Emerging Industries



The emerging industries in the Merrimack Valley that will be covered in this chapter are Food Products, Medical Instruments and Supplies Manufacturing, and Trucking and Warehousing. The criteria by which these industries were selected differ considerably from the critical industry criteria. The emerging industries share in common the following characteristics:

They employed at least 1,000 people in the Merrimack Valley in 2001 and grew rapidly over the previous five years.

They have strong projected growth in the region, both from formal economic projections and from the perspective of economic development efforts.

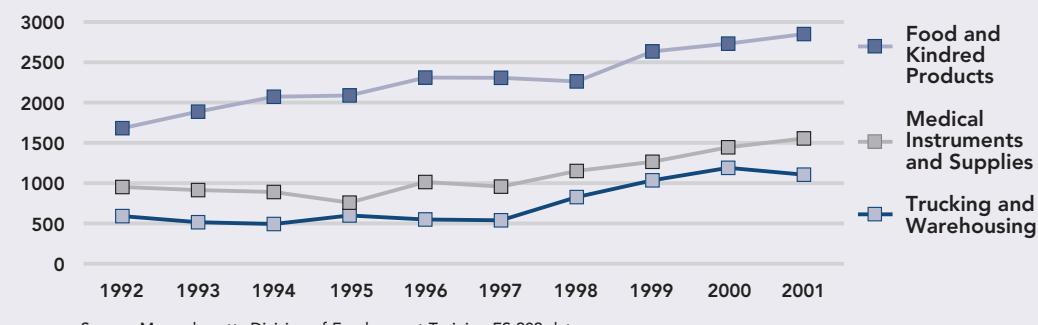
They employ people in new and emerging occupations.

Over the past ten years, employment has grown substantially in each of these industries. The factors outlined above are likely to provide support for continued growth of these industries in the region.

Several factors regarding these industries generally bear discussion prior to focusing on the characteristics of each industry individually.

First, this report is specific to the Merrimack Valley region. Some of the emerging industries may be slow-growth on a national basis, but if they are growing their workforces in the Merrimack Valley region, then they should properly be considered as emerging for the purposes of this report. Second, the workforce development system must consider the employment needs of all skill levels of workers.

FIGURE 6.1 MERRIMACK VALLEY EMPLOYMENT IN EMERGING INDUSTRIES: 1992-2001



Source: Massachusetts Division of Employment Training ES-202 data.

Therefore, industries may be included that do not have a positive public image but that will make a significant contribution to employment growth in the region, as well as supporting other industry clusters.

FOOD PRODUCTS

The Food Products industry is comprised of firms that convert raw resources, agricultural products and chemically-derived products, into finished food products, primarily for wholesaling to customers that sell the products to the end-users. Food Products firms in the Merrimack Valley are primarily producing products that are wholesaled, although some focus on retail, direct-to-customers sales as well. The Food Products industry in the Merrimack Valley includes national firms as well as independent companies headquartered in the region.

The Food Products industry has the potential to utilize a number of economic development assets in the Merrimack Valley region. Access to transportation is critical in this industry. The Merrimack Valley's easy access to Maine, New Hampshire, and Massachusetts is an important advantage for an industry that does not need to have too many production facilities in one multi-state area. This advantage also implies that once a food industry cluster takes root in a particular area, it will be less likely to move out of the area than other industries. Another economic development advantage is the number of warehouse and manufacturing facilities that

are readily available and can be utilized by the firms in the Food Products industry with relatively little retrofitting required.

From a workforce development perspective, the Food Products industry offers an important opportunity to utilize a segment of the Merrimack Valley's workforce that few of the other critical and emerging industries use in large numbers. That segment consists of lower skilled workers, many of whom do not have strong English speaking skills. Many of the production level jobs in the industry are fairly routinized and therefore little English speaking skill is required. A number of firms in the industry have utilized this population as an important part of their workforce. If, as discussed below, this industry is likely to retain jobs in the region, as opposed the loss of a large number of production jobs in lower-level manufacturing firms, it will represent an important employment opportunity for this segment of the region's labor force to access employment opportunities.

The Food Products industry also provides opportunities for workers to advance to positions requiring more technical skill and/or communications skills (to the supervisor level, for example). These opportunities provide access points for the workforce development system to engage with businesses in this industry.

Geographic Clusters

The food cluster in the Merrimack Valley is focused in Haverhill. Economic development in this city has really focused on attracting and growing this industry.¹ The Food Products industry is probably the strongest example of an industry cluster that the Merrimack Valley region has. A number of Food Products firms are located in the region, primarily but not exclusively in Haverhill. Economic development and planning officials in the region indicate that other firms from outside the region are exploring the idea of moving into the region. As more Food Products firms move into the region, businesses in industries that serve the Food Products industry, such as Trucking and Warehousing, will also grow. This mutual growth and development will strengthen all of the region's businesses in the cluster, making them less likely to leave the region. This in turn will support one of the key economic development strategies for the region which is to support industries that are in the Merrimack Valley for the long haul.

FIGURE 6.2 MERRIMACK VALLEY FOOD PRODUCTS EMPLOYMENT BY LEVELS: 2002



Source: Massachusetts Division of Employment Training ES-202 data. Analysis by the author.

Employment Growth

In March, 2003, there were 53 Food Products firms, employing 1,894 people in the Merrimack Valley region.² This represents nearly 100% growth in employment in the Food Products industry in the Merrimack Valley region since 1992.

Employment by Levels

More than 70% of total employment in the Food Products industry is in positions that do not require a Bachelor's degree or beyond in formal education. For jobs that require less than a Bachelor's degree in formal education, the occupational profile shown in Figure 6.2 demonstrates support for the development of career ladders programs in the industry. About 44% of the pre-baccalaureate jobs are in Level One positions and about 27% are in Level Two and Level Three jobs. This profile demonstrates that there are a substantial number of opportunities for workers to advance in the industry.

Key Occupations

Production Workers

Duties: Prepare and package food products according to batch instructions provided by the company. Often uses electrical equipment. Must be detail oriented and safety conscious.

Critical degrees, credentials, skills: Most companies strongly prefer workers to have High School diplomas or GEDs. Must have a positive work history, although not necessarily in the Food Products industry.

Wages \$8-\$11 per hour

Benefits: Most companies provide full-time permanent workers with access to health insurance, although the amount the employ must pay varies widely between companies.

Career Pathways: Generally limited. Some production workers can become supervisors or go into specialty areas of production such as baking assistants.

Requirements for Advancement: Communications skills, bilingual ability strongly preferred in many companies. Training is often provided through seminars or on-the-job training (OJT).

Projected Demand: Government estimates of growth in this segment are low.³ However, employers in the region estimate that there will be a higher level of growth in this occupation in the Merrimack Valley than projected.

Shipping/Receiving

Duties: Utilize power equipment such as forklifts and motorized pallets to load and unload trucks. Use scanners and paper-and-pen recordkeeping (depending on the company) to monitor incoming and outgoing shipments.

Critical degrees, credentials, skills: High school diploma or GED. Power equipment operation skills and/or certificate.

Wages: \$12-\$15 per hour

Benefits: See above.

Career Pathways: General career ladder is to shift supervisor and then into management. Some workers can transition into other areas of the company with training.

Requirements for Advancement: Same as above.

Projected Demand: Modest growth.

Maintenance Mechanic

Duties: Repair baking and food processing equipment. Perform preventive maintenance as required.

Critical degrees, credentials, skills: High school diploma or GED required. Associates degree or certificate in relevant area strongly preferred. Some computer skills preferred as well.

Wages: \$25-40K per year

Benefits: Positions generally offer full benefits including health insurance, bonuses, etc.

Career Pathways: Maintenance mechanic ► Supervisor ► Maintenance manager

Requirements for Advancement: Computer skills, supervisory training. Bilingual capability is preferred.

Projected Demand: Moderate projected demand for these positions through 2008.

Critical Human Resource Needs

Soft skills and bilingual capacity, particularly for supervisors, are the largest human resource need reported by the Food Products businesses we interviewed. Many of these companies do invest in training through OJT systems, internal training, and outside seminars and technical training. However, they do see additional needs for soft skills and language training. Also, some companies reported smaller scale needs for training in technical skills areas such as equipment mechanics, truck drivers, and vehicle mechanics.

Conclusion

The Food Products industry offers an excellent opportunity for engagement by the economic development and workforce development systems in the Merrimack Valley. A cluster is already in the process of being developed in the region and it appears likely that more firms in this industry will be attracted to the region over the next several years, fueling additional employment growth. In addition, the Food

Products industry is also important to the region because it uses a lower-skilled workforce that has been displaced from assembly jobs and has had a difficult time finding employment in the region's current industry mix. The Food Products industry offers the potential for long-term employment for some of these workers as the industry grows in the region.

MEDICAL INSTRUMENTS AND SUPPLIES MANUFACTURING

The Medical Instruments and Supplies Manufacturing sector is an important component of the manufacturing industry in Merrimack Valley as it is one of the few manufacturing sectors that have seen employment growth over the past ten years. The sector is also seen as important by statewide economic developers who are seeking to maximize the state's competitive advantages in this industry including access to new product development through the state's educational system and access to a highly skilled manufacturing workforce, which many companies in this industry require. The Merrimack Valley is well positioned to support statewide efforts due to strengths in both of these areas.

The Medical Instruments and Supplies Manufacturing industry is comprised of a number of smaller sectors. Statewide, 37% of employment in the industry is in the surgical and medical instruments sector, followed by electro-medical and electrotherapeutic devices (23%), surgical appliances and supplies (11%), irradiation apparatuses (9%), ophthalmic goods (9%), in vitro diagnostic substances (7%), and laboratory apparatuses and furniture (4%).⁴

From an economic development perspective, the Medical Instruments and Supplies Manufacturing industry offers the Merrimack Valley region an opportunity to build up its exports. By some estimates, more than 50% of the output of Massachusetts' medical device companies is exported outside the state.⁵ The development of so-called traded or export clusters is a high priority for the Regional Competitiveness Councils and state economic development efforts. To the extent that the region can capture a greater share of firms and employment in this industry, it will develop a cluster of firms that may provide a manufacturing base for the future.

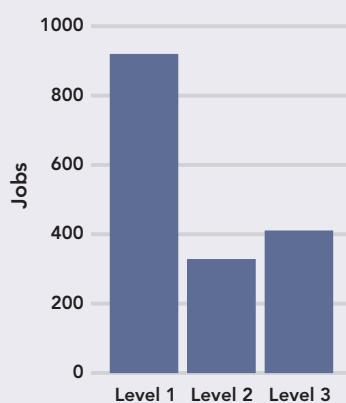
From a workforce development perspective, it is important to differentiate between firms which have products on the market and those which are still in the product development and approval stage. Companies with products approved and on the market are more likely to have manufacturing positions that would utilize the Merrimack Valley's skilled labor force, particularly those who have previously held high-tech manufacturing jobs. Companies which are in the product development phase, on the other hand, are likely to have the vast majority of employment in their companies concentrated among scientists, engineers, and computer programmers, all of which require high levels of formal education.

At the point where companies in the medical instruments and supplies industry have a product on the market, they need to make a choice of whether to manufacture the product themselves or to hire contract manufacturer to make the product. Companies that manufacture their product themselves are most beneficial to both the economic and workforce development systems of a region for two reasons. First, companies that manufacture their own products are more likely to hire a large number of production and manufacturing workers in the region. They are also likely to use larger square footages of space and other economic development assets of the region. Second, companies that establish a manufacturing facility in a particular are not likely to move it in the short- and medium-term due to governmental regulation and oversight of the manufacturing of these products.

Geographic Clusters

The Merrimack Valley has relatively few firms in the medical instruments and supplies industry currently. The companies that are currently in the region are concentrated in Andover and Lawrence. However, it is important to note that efforts are under way

FIGURE 6.3 MERRIMACK VALLEY MEDICAL INSTRUMENTS AND SUPPLIES MANUFACTURING BY LEVELS: 2001



Source: Massachusetts Division of Employment Training ES-202 data. Analysis by the author.

to attract other companies into the region, particularly utilizing the physical infrastructure assets of the region. Also, the Southern Essex region has a large number of Medical Instruments and Supplies Manufacturing industry firms in their region, located just to the south of the Merrimack Valley. Some jobs in these firms may be accessible to workers from the Merrimack Valley and these firms may also contribute to the development of a Medical Instruments and Supplies Manufacturing industry cluster in northeastern Massachusetts.

Employment Growth

Medical instruments and supplies employment grew by 69.44% between 1992 and 2001.⁶

Employment by Levels and Key Occupations

Approximately 57% of all jobs in the Medical Instruments and Supplies Manufacturing industry are in occupations that do not require a Bachelor's degree or above in formal education. Of those jobs, 55% are located in Level One, 20% in Level Two, and 25% in Level Three. While this may appear to result in few career ladders opportunities for advancement, an examination of the Level Two and Level Three occupations (see Appendix A) shows a close connection between a number of jobs that require significant levels of technical skills training. However, much of the Level One employment is in positions that are disconnected from the occupational skills training such as clerical, secretarial, and hand assembly positions. The overall message is that while it may be difficult to access career ladders in this industry, there are significant numbers of Level Two and Level Three jobs that require high levels of technical skill and offer significant opportunities for training and growth.

Information on key occupations in the Medical Instruments and Supplies Manufacturing industry is included in Chapter 5.

Conclusion

The Medical Instruments and Supplies Manufacturing industry is one of the region's best opportunities to attract and retain skilled manufacturing and production jobs in the Merrimack Valley. The region's workforce already possesses a number of transferable skills that would be extremely valuable in the Medical Instruments and Supplies Manufacturing industry. The infrastructure that this industry requires is readily available in the region and there is the beginning of an economic cluster for the industry in northeastern Massachusetts. In addition, the industry is being driven by a demographic trend, the aging of the "baby boom" generation. That the industry will expand somewhere is inevitable. The goal for the Merrimack Valley's economic and workforce development systems should be to help the industry expand here in the region rather than moving out as so many other types of manufacturing have.

TRUCKING AND WAREHOUSING

Trucking and Warehousing is likely to be the most controversial industry included in the MVWIB's roster of critical and emerging industries. Many people perceive that the industry has become outmoded in the era of internet communications and companies keeping smaller stocks on hand. Nationwide, growth projections for this industry are modest at best. Furthermore, many of the jobs in people's perceptions of the industry are the type of material moving and hand work jobs that are in such rapid decline in the manufacturing industry.

Further examination, however, makes clear that these beliefs do not reflect the true state of the Trucking and Warehousing industry. Global changes in the economy such as internet communications and smaller stocks being kept on hand by companies have actually increased demand for the services of the Trucking and Warehousing industry. After all, who delivers your order from Amazon, eBay, and other online merchants? Often it is UPS, FedEx, or an independent Trucking and Warehousing

company. On the employment side, there are fewer hand moving jobs in the industry than in years past, although these types of jobs can never be eliminated entirely. Many of the occupations that are currently in demand in the industry are on the logistics side of the business and require significant computer skills and technical skills, as well as knowledge of the business. Finally, jobs such as truck drivers and mechanics require skills and training, although not necessarily high levels of formal education, and offer good wages and benefits at many companies in the region.

It is important to recognize that while the industry overall is projected to grow only slightly on a national basis, many regions are expecting to lose employment in this industry due to consolidation. The Merrimack Valley can add jobs in the Trucking and Warehousing industry, even if growth remains relatively static for the industry on a national basis. The region has several important factors in its favor that will support the growth of the industry here. These include:

- The Merrimack Valley is a central transportation hub. At the intersections of Route 93, heading north to New Hampshire and south to Boston, Route 95, heading north to Maine and south to Boston, and Route 495, providing access to Route 90 and New York and points west, the region is centrally located. There are also airline, rail, and sea transport facilities located close by.
- The Merrimack Valley has a number of facilities that are currently outfitted for the industry or could easily be retrofitted if needed, providing the necessary infrastructure to support the Trucking and Warehousing industry.
- The region currently has several large employers in this industry, which can help to attract additional businesses to the region.
- The region has a strong workforce at all levels needed to support the development of businesses in the Trucking and Warehousing industry.

Geographic Clusters

Regionally, there is currently a strong cluster of Trucking and Warehousing firms located in Haverhill. This cluster is focused primarily on the trucking side of the equation and these firms tend to be the largest in terms of employment. There is a smaller cluster of firms in Lawrence and Methuen that are focused on the storage side of the business. These firms tend to have smaller levels of employment than those focused on the trucking or transportation side of the business. However, many of these firms, depending upon the location and condition of their facilities, can often make a rapid transition to the trucking side of the business when opportunity is available, assuming that they have adequate access to capital.

Even though it is not located in the Merrimack Valley region, the United Parcel Service (UPS) plant in Chelmsford is an important employer of Merrimack Valley residents. The UPS-Chelmsford facility is a hub for the Trucking and Warehousing in the region, employing over 1,500 people, making it the largest employer in this industry in northeastern Massachusetts. Because of the large numbers of employees, commitment from the company, and the fact that it is a union firm, jobs at UPS-Chelmsford offer career ladder opportunities and strong wages. It also attracts other firms to the area that provide services to this large center, prompting the development of a cluster of firms, some of which are located in the Merrimack Valley region and many of which, if not located here, at least employ Merrimack Valley residents.

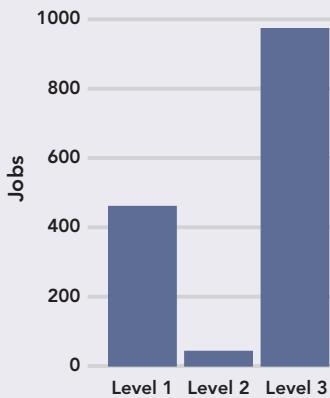
Employment Growth

In March 2003, transportation and warehousing employed 2,383 people in 172 firms in the Merrimack Valley region.⁷ Between 1992 and 2001, the employment in the Trucking and Warehousing industry grew by over 130%.

Employment by Level

Eighty percent of all jobs in the Trucking and Warehousing industry are in jobs that do not require a Bachelor's degree or above in formal education. Jobs that do not

FIGURE 6.4 MERRIMACK VALLEY TRUCKING AND WAREHOUSING EMPLOYMENT BY LEVELS: 2002



Source: Massachusetts Division of Employment Training ES-202 data. Analysis by the author.

require a Bachelor's degree are concentrated in the third level, with approximately 65% of jobs in Level Three. Level One has about 30% of the pre-baccalaureate jobs, with only 3% of such jobs located in Level Two. This occupational profile indicates that the development of career ladders programming may be difficult due to the lack of short- and intermediate-term growth opportunities in Level Two jobs. However, the large volume of opportunities at Level Three that offer very strong wages and benefits and have high growth projections through 2008 make it worthwhile to work with this industry to identify firm-specific opportunities for career ladders development.

Key Occupations

Truck Driver

Duties: Transport products between facilities and to consumers. Some larger facilities also have specialized vehicles to move trailer units within the facility.

Critical degrees, credentials, skills: Commercial Drivers License (CDL), often requiring additional certifications such as Hazardous Materials and Air Brakes. Some firms require lower-levels of licensing for smaller package trucks and vans. Licensing and experience are usually required to access jobs in these occupations.

Wages: Range widely across employers, between \$12 and \$27 per hour. Jobs with some employers offer overtime opportunities as well.

Benefits: Most companies pay health insurance. Some companies offer a wide menu of benefits including dental, life insurance, tuition reimbursement, and profit sharing or 401(k)s.

Career Pathways: In some companies, promotion from within is standard, provided that there is a pool of internal candidates with the required training. Other companies tend to recruit more from the street. Workers who come in as seasonal workers may move to permanent status and workers who begin their careers as package truck or van drivers may obtain CDL licenses and move up to larger trucks and over-the-road hauling, which usually carries with it an increase in pay.

Requirements for Advancement: Additional training or certification. In some cases, companies offer tests of physical or problem-solving ability to workers in order to qualify for promotional opportunities. In companies where the workers are represented by a union, promotion is done based on seniority once eligibility for the next level of job is established through credentials or testing.

Projected Demand: Currently, a number of businesses interviewed stated that CDL truck drivers were hard to hire. Projected demand for this occupation is quite strong, with numbers of both new and replacement positions expected to be available over the next five years.

Mechanic

Duties: Maintain trucks, trailers, and vans of the company. Can include welding and other structural repair of trailers, finishing work, and engine preventive maintenance and repair. Work may be done in a central facility or on the road to make emergency repairs.

Critical degrees, credentials, skills: Most incumbents have a High School diploma or GED. Technical training school or an associates degree is required. For some companies, both gasoline and diesel repair certification is required. Usually, this certification comes from a specialized technical school.

Wages: Range widely across employers, from \$12-\$25 per hour. Jobs with many employers require overtime as needed.

Benefits: See above.

Career Pathways: Generally limited. In some companies, employees come in working on trailers and advance to working on preventive maintenance and engine systems as openings occur and as they gain the requisite qualifications.

Requirements for Advancement: Additional technical certifications and supervisory skills.

Projected Demand: Expected to be quite strong over the next five years. Many local Trucking and Warehousing businesses find mechanics with the necessary certifications and experience hard to find.

Logistical Support

Duties: Use of computers, Geographical Information Systems (GIS), and other aspects of technology to ensure that the flow of goods proceeds as efficiently as possible and that customer needs for timely deliveries are met.

Critical degrees, credentials, skills: Most workers in this occupation have at least a Bachelor's degree in computer science, information systems, management, or related fields. What is most important is experience in the industry. One company said that almost every worker in the company started as a package handler and worked his or her way up. The experience of working on the shop floor is extremely valued in that company.

Wages: Salaries range from \$30,000 per year upward and differ quite a bit between companies.

Benefits: Same as above.

Career Pathways: Logistics positions represent one method into a company's management structure. From logistics, one can choose from a number of options.

Requirements for Advancement: Formal computer education, systems certification, experience in the Trucking and Warehousing industry. Good communications and teamwork skills are required at all levels.

Projected Demand: Very strong projected demand as this position is requiring increasing amounts of technical skills

Critical Human Resource Needs

A number of specific occupations, particularly those requiring licensing or certification, are difficult to find even in the current economic downturn. Contributing to this problem is a lack of public understanding of the quality of jobs available in the industry and the level of technical skill required. Also, several businesses in the industry require most workers at all levels to have started at the lowest rungs of the company and work their way up so that they have a solid understanding of the industry.

Conclusion

Many people have a mistaken view of the Trucking and Warehousing industry and the occupations within it. The industry is often seen as dirty, producing congestion and negative environmental impacts, and having low-skilled, low-wage jobs. Many of these concerns have been significantly reduced as issues for the industry over the past ten years. The industry has entered the e-commerce age and now has needs for large numbers of workers with computer skills, logistics and planning capabilities, and other "high-tech" strengths. While the industry contains a variety of types of businesses, many of the companies visited for the research for the Blueprint were kept meticulously clean to preserve the high-tech (and expensive) machinery that these firms require in order to operate successfully. Furthermore, while wages varied significantly across firms, in general, wages were higher than might have been expected and all of the firms interviewed in this industry indicated current employment opportunities and human resource challenges, a significant difference from some of the other industries that we interviewed for the Blueprint. Overall, the evidence has clearly shown that the Trucking and Warehousing industry is one that merits strong attention from the Merrimack Valley's workforce development and economic development systems.

ENDNOTES

1 Meredith Goldstein, "Thought for food: Industry develops taste for this appealing city," Boston

Globe, September 14, 2003.

2 Source: Massachusetts Division of Employment Training Employment and Wages Report (ES-202). Please note that because of a bureaucratic change in data classification, 2002 data are not precisely comparable with the earlier data and so are not included in the figures.

3 Source: Massachusetts Division of Employment Training, "Massachusetts Employment Projections Through 2008."

4 Source: Alan Clayton-Matthews, *The Medical Device Industry in Massachusetts*. Boston, MA: The University of Massachusetts Donahue Institute, 2001, p. 4.

5 Alan Clayton-Matthews, *The Medical Device Industry in Massachusetts*. Boston, MA: The University of Massachusetts Donahue Institute, 2001.

6 Source: Massachusetts Division of Employment Training ES-202 data. Due to changes in definition between the SIC and NAICS classification schemes, comparable data for 2002 and 2003 are not available.

7 Source: Massachusetts Division of Employment Training ES-202 data. Note that the transition from the SIC to NAICS categories has affected this industry quite a bit so the 2001 data are not specifically comparable to the 2002 and 2003 data. The more recent data is likely to overestimate the number of jobs in trucking and warehousing by including some other categories that were previously counted in other industries.

Chapter 7. The Regional Training System



The Merrimack Valley Workforce Investment Board (MVWIB) provides policy governance and oversight to a regional training system that includes institutions of higher education, vocational schools, and community based basic education and occupational skills training programs. The goal of the regional training system is to ensure that residents of the region are able to get the skills, education, and certifications necessary to access jobs in the critical and emerging industries where there is current and projected future demand for workers. The system is designed to support the development of the workforce in the region and also to support economic development efforts to grow businesses in the area. In conducting research for the Blueprint, we took an environmental scan of the regional training system. The scan looked at the overall capacity of the training system to serve the needs of residents of the Merrimack Valley and then focused specifically on the capacity of the system to make connections with the identified human resource needs of critical and emerging industries as described in the previous chapters. We finally looked at the funding sources that support the regional training system and the ways in which these funding sources do or do not support training that meets the needs of businesses in the critical and emerging industries.

HIGHER EDUCATION

There are two institutions granting four year college degrees located in the Merrimack Valley region. Merrimack College, located in North Andover, and Cambridge College, which just opened this year in Lawrence. Merrimack College is a liberal arts university offer degree programs in liberal arts, science and engineering, and business. Certificate programs are offered in Supply Chain Management, Project Management, Information Technology, Human Resources, and Quality Management. Merrimack College also offers space to Suffolk University to provide the Masters of Public Administration program at its campus in North Andover. Cambridge College is a college designed for working adults that provides bachelor's and master's degrees and the Certificate of Advanced Graduate Study (CAGS) in areas including education, psychology, and management. Also, the Massachusetts College of Law in Andover offers working adults the opportunity to earn a law degree in the evening. Law degrees earned from the Massachusetts College of Law are accepted in the state of Massachusetts.

Northern Essex Community College operates branches in Lawrence and Haverhill. The curriculum offerings of Northern Essex are quite broad ranging from traditional Associate's Degree programs in the liberal arts to technical Associate's Degrees in areas including nursing, medical technologists, electronics engineering and computer science. Northern Essex Community College also offers a number of technical certificate programs that meet the needs of critical and emerging industries in the region. In addition, the Northern Essex Community College Center for Business and Industry works with local businesses to provide customized training that meets their needs. Northern Essex Community College has been one of the top ten training providers in the state through the Massachusetts Workforce Training Fund. A number of employers that were interviewed in the critical and emerging industries said that Northern Essex Community College is one of the organizations that they regularly work with to fill their needs for hiring of new employees and providing training for incumbent workers.

In addition to using institutions of higher education located in the Merrimack Valley region, residents often take advantage of nearby opportunities at institutions that are not located in the region. North Shore Community College, with campuses in Danvers and Beverly, and Middlesex Community College, with campuses in Lowell

and Bedford, are often utilized for technical skills training in areas that Northern Essex Community College does not provide. In addition, the University of Massachusetts Lowell provides technical skills training in a number of areas leading to Associate's Degrees, Bachelor's Degrees and beyond. These areas included engineering, plastics, nursing, and number of other technical skills areas. One of the recommendations that has been made by the Merrimack Valley Workforce Investment Board of Directors has been to encourage the Massachusetts state university system to open a campus in the Merrimack Valley region to offer the region a wider variety of technical skills training needed by businesses in the critical and emerging industries.¹

ESOL AND ABE

A major issue for residents of the Merrimack Valley region as well as businesses who need to employ them has been the development of basic skills including mathematics and English communication skills, both written and verbal. A number of providers of English for Speakers of Other Languages (ESOL) and Adult Basic Education (ABE) classes exist in the region. However, there are large waiting lists for nearly every program. A recent estimate in the City of Lawrence alone documented total unduplicated waiting lists for ESOL programs of more than 1,600 people. Since most participants in ESOL and ABE programs identify that they are in these classes to be able to access either employment opportunities for the first time, or to be able to gain a promotion at their current jobs, it seems clear that the significant waiting lists for ABE and ESOL classes are a significant drag on preparing employees with the skills that businesses have identified as needed. Therefore, it is one of the strongest recommendations of this report that everything possible be done to expand the availability of ESOL and ABE classes in the region, including making more classes available and making classes available at multiple times that are more accessible to residents who work a variety of different shifts and have a variety of different levels of child care and family responsibilities.

A second issue around ESOL programming is the context in which training is provided. Businesses have consistently identified the need for ESOL training to be contextualized to the workplace meaning that the training utilizes the vocabulary that a worker would encounter during an average day on the job. Research has shown that by teaching ESOL in such a manner people who are taking the classes learn faster and have greater retention of the language skills that they are gaining.² Building and enhancing the curriculum in such a manner is clearly a win-win for both people taking the classes and businesses who will then employ or promote workers from these classes.

Enhancing the capacity and effectiveness of the Merrimack Valley region's ESOL and ABE system is also important because language and math skills are often critical barriers to additional training. Many residents who come to the Valleyworks Career Center seeking training are unable to access training because of their lack of sufficient English language or math skills. As of September 2003, there are no occupational skills classes on the local approved training list that a person with an SPL level below 3 can go into. People with low levels of English speaking skills are referred to community-based ESOL and ABE programs, where they often run into the lengthy waiting lists previously described.

Finally, it is critical that the mathematics component of ABE be enhanced and, like ESOL, contextualized to the needs of businesses in the critical and emerging industries. Employers interviewed for the Blueprint identified lack of mathematical skills from both products of the public K-12 school system and the ABE system as an important issue. One employer told us, "you can give them the formula and they still can't do the math." Because mathematics is important both for providing a skilled workforce and also as a foundational skill for obtaining further technical education, it is imperative that the mathematics education component of the ABE curriculum be an area of focus and that residents' skills be enhanced in this area.

OCCUPATIONAL SKILLS TRAINING

The Merrimack Valley region is fortunate to have a vibrant community of occupational skills training providers in the form of community-based organizations, for-profit training firms, and community colleges and other institutions of higher education. More than 700 courses are listed on the Merrimack Valley region's approved-provider list. Training is available in a number of occupational skills training areas and there is a high degree of success in terms of job placements for residents who have completed the courses. The current economic downturn has made it more difficult to achieve the same high placement rates that have historically been the case. This environment is challenging the system to change to meet the needs of businesses as they adapt for future success.

Residents of the region have the option to take courses in a number of areas that are relevant to the critical and emerging industries in the region. However, there are also gaps that exist between business identified needs and the current capacity of the regional training system.

- In **Health Care**, there are a large number of program opportunities, mostly at lower levels including certified nursing associates, phlebotomists, and medical office receptionists. Technical skills training meeting the industry needs for x-ray technologist, mammography technologists, and MRI technologists, however, are in relatively short supply. They are also more difficult to get into because higher levels of English language and basic mathematical skills are required.
- There are relatively few training programs in the region that meet the needs of the **Construction** industry with the exception of union sponsored apprenticeship programs. There is clearly opportunity for the development of pre-apprenticeship training programs to give people the skills they need to be able to enter apprenticeship training as well as to develop programs that meet specific target niches that were identified by businesses in the construction industry.
- For **Manufacturing**, there are a number of general training programs. However, as the manufacturing industry has become more technically complex, and with increased reliance upon certification standards, there are few training programs that meet these needs in the region. There are some programs that offer certification in welding, such as J-standard certification programs. However, more of these programs could be developed and training providers should work closely with businesses to identify specific other training opportunities in the industry.
- The **Communications** industry has identified a lack of sufficiently skilled training providers that are able to provide the depth of quality training that is required. Given the strength of growth in the communications industry, particularly in the cable and pay TV sector, training providers should pay close attention to this opportunity and develop training options that would meet the needs of both businesses and residents of the region.
- Fewer training needs were identified for emerging industries of **Food Products** and **Medical Device and Supplies Manufacturing**. Employers are relying upon the currently available workforce and primarily conducting training in house.
- In the **Trucking and Warehousing** industry, there is a strong need for drivers with the commercial driver license (CDL). While there are training programs in the region that provide this training, they are relatively small and their output over the past two years has been insufficient to meet industry needs. The second area of demand from the Trucking and Warehousing industry is for certified mechanics who have been trained on both gas and diesel engines. Again, there are training programs, including at the vocational schools, which provide this training. However, the number of people from the Merrimack Valley who have been trained in this area has been insufficient.

The single largest area of training that is provided by community-based organizations in the Merrimack Valley region is for the use of computers. Training in this

are includes training for use of the Microsoft Office suite of applications, computer networking, and other specialized software usage. Some training providers combine this training with GED or ESOL instruction. Given the amount of computer training that is being provided, it is important to note that none of the businesses we interviewed in any critical or emerging industry identified computer skills as an area where there was important unmet need. The use of computers on the job is seen as a basic skill that workers are expected to have but not as a technical skill or specific skill that will help a worker get a job. Therefore, the reliance on computer training as a large portion of the region's effort to get workers into jobs in the critical and emerging industries and other industries appears to be misplaced. Generalized computer training appears to be an example of training for the last big thing rather than operating with a futures perspective on the requirements of jobs from the present going forward. Training providers who are working in the computer training area should work closely with employers to make sure that the skills they are training for are ones that will be in demand by businesses and that jobs will be available for workers who successfully complete their programs.

Significant gaps between the needs of businesses in the critical and emerging industries and the current capabilities of the regional training system have been documented. While some training providers have close relationships with businesses, many programs still seem to operate in the old way of developing training programs, providing the training, and then seeking out job placements for their graduates. This is not an effective way of engaging businesses in the critical and emerging industries. The MVWIB should ensure that all training providers in the region have close connections with businesses in the industries where they intend to place people from their programs. Businesses must be involved in identifying training needs, developing curriculum, and evaluating the ongoing success of the program. In return, training providers should request the involved businesses to make commitments to provide internships and interview candidates who successfully complete the training program. In this way, the regional training system will become more truly responsive to the needs of businesses in the critical and emerging industries as well as residents of the Merrimack Valley region.

There are also important gaps between the capacities of the current occupational skills training providers and the needs of the region's residents. Access to training for residents without strong English speaking skills is limited. Some providers do combine ESOL and occupational skills training but many do not, leaving residents with low levels of English speaking skills competing for limited spaces in ESOL programs and locked out of employment opportunities leading to jobs that pay self-sufficiency wages. Over the past two years, several new training organizations have begun to provide training services to people with limited English-speaking skills through the region's Individual Training Account (ITA) system. However, the demand for such training continues to exceed the supply by wide margins, so the addition of additional capacity and capabilities in this area is recommended.

GEOGRAPHIC CLUSTERING

The majority of training services that are provided in the Merrimack Valley region are located in the region's two largest cities, Lawrence and Haverhill. Therefore some residents may find it difficult to access training services that they need. It is also important to note that the Merrimack Valley Workforce Investment Board funds a large number of training programs outside of the region including in Southern New Hampshire and on the North Shore and in the City of Boston. While these programs offer additional opportunities for workers to access training that is not necessarily available in the Merrimack Valley region, some of the workers who are most in need of obtaining training may find it difficult to access training due to transportation difficulties that make it impossible to get to training outside of the immediate area. Where possible the Merrimack Valley Workforce Investment Board should seek to

attract additional training opportunities into the region, particularly in underserved areas and training that meets the needs of industries where there are gaps that have been identified previously.

THE ROLE OF THE VALLEYWORKS CAREER CENTER

The Merrimack Valley Workforce Investment Board charters and oversees the Valleyworks Career Center with two locations, one in Lawrence and one in Haverhill. The Career Center plays a pivotal role in the regional training system. One of their key functions is to provide core and intensive services to the region's residents. Core services are those which are available to any person seeking services include:

- Initial assessment of skill levels, aptitudes, abilities, and support services needs;
- Job search and placement assistance and career counseling;
- Follow-up services including counseling regarding the workplace, for participants in training programs who have been placed in unsubsidized employment.³

While Valleyworks Career Centers do not provide occupational skills training directly, they interface with training providers by providing referrals of people seeking training. Prior to referral, any person wishing to enter training must complete a full assessment of skills, education, and marketability, have their eligibility determined, and be provided with information on a variety of appropriate training options. After training is provided, career center staff assist with job search and placement (the training provider is also responsible for this role) and conduct case management activities to help ensure that the person who received training is successful on the job.

An area where there is a potential disconnect between the needs of businesses in the critical and emerging industries and the current system is in preparation for career success over the long term. Valleyworks Career Center staff should ensure that all participants who are being case managed develop a long-term career plan. This plan should take into account the occupations identified as demand occupations by businesses in the critical and emerging industries, particularly those that pay self-sufficiency wages. To implement these plans, closer connections need to be developed with the higher education system, particularly Northern Essex Community College, to meet the needs for technical skills training that were identified by many of the businesses interviewed for the Blueprint.

FUNDING SOURCES

Funding for the region's training system comes from a variety of sources, including the Workforce Investment Act, Department of Transitional Assistance, Welfare-to-Work, Department of Education, and private sources. This diversity of funding systems is both a strength and challenge to the system. The strength of the system is that it provides additional resources for training. Many of the resources provided meet the needs of the region's population that are most in need of additional training in order to obtain employment in the critical and emerging industries. The weakness of multiple training funding sources is that it is difficult for an individual training provider to manage the diversity of requirements of the funding sources in a way that works out best for the individual worker being trained. To the extent possible the MVWIB should work to ensure that there is a transparent and easily accessible training system in the region regardless of the diversity of funding sources being utilized to support the system.

ENDNOTES

1 Merrimack Valley Workforce Investment Board, Workforce Development Policy White Paper, September 10, 2003

2 See, for example, Kevin Kavanaugh, "Teaching the Language of Work," *Training and Development*, April, 1999, p.14-16.

3 Michael Brustein and Jennifer Vasta, *The One-Stop Guide to the Final WIA Regulations*. Washington, DC: Brustein and Manasevit, 2000, p. 41-42.

Chapter 8. Making the Match



The previous five chapters have considered the status of the region's labor force, the needs of critical and emerging industries in the region, and the capacity of the regional training system to fulfill those needs. While each of the previous chapters have considered these elements separately, this chapter will begin to bring together the needs and capacities of each of the three elements to provide the foundation for recommendations on policies to help improve the workforce development system in the region. This work is consistent with an overarching theme of this Blueprint which is to bring together all of the elements, including workforce development and economic development, to ensure that there is a smooth, cohesive system in place to respond to the needs of both critical and emerging industries and residents of the region as they try to match up in a way that meets the needs of both groups.

LABOR SUPPLY

In Chapter 3 we examined the various segments of the labor supply, the residents of the Merrimack Valley region. In general, the region has a large, diverse, and fairly skilled workforce. In fact, the region's workforce is so large that there is a surplus of more than 12,500 people who work in other regions.¹ As more jobs are created in the critical and emerging industries in the region, it is possible that many of these Merrimack Valley residents may be attracted to jobs closer to home, in turn supporting the development of additional firms and building additional capacity in the critical and emerging industries in the Merrimack Valley region. Some of the workers in the region who work outside of the region may be able to find jobs in the same industry; others may need training to transfer from one industry to another that requires additional human resource capacity. One of the requirements of the workforce development system will be to continuously interact with businesses in the critical and emerging industries to identify ahead of time potential needs for human resources that can then be met either by training, focused recruitment, or a combination of methods to support both the critical and emerging industries and residents of the region.

While looking at the overall status of the region's labor supply is interesting, good workforce development policy requires practitioners to look at segments of the labor supply and identify their particular skills and capacities and then to match them up with the emerging and critical industries that may need to employ workers with those skills. The Merrimack Valley region has at least three main segments in its labor supply. First, the region has strong representation in professional and managerial occupations. Second, there is a large pool of technically-skilled workers from the manufacturing industry, many of whom have been recently displaced from Lucent Technologies and other high tech electronics manufacturing firms in the region. Finally, there is a significant pool of lower skilled production workers who are available and have experience in manufacturing, shipping, warehousing, and a number of similar occupations. The remainder of this section will describe the potentials and challenges facing each of these labor supply components.

People employed in professional and managerial occupations have generally been most resistant to economic downturns. However, this economic downturn has included unprecedented levels of occupations. Many residents of the Merrimack Valley region who were previously employed in professional and managerial occupations have found themselves displaced in this most recent economic disruption. A further problem is that many of these jobs may not come back even when the economy turns around and begins to improve.² In addition, companies have been motivated in the recent economic downturn to run "leaner" than ever before and so

it is likely that many companies will not have the same level of managerial employment then they had before the economic downturn.

However, there is some good news for these workers. First, people who have been employed in professional and managerial occupations usually have very strong skills and significant levels of education. Second, most companies have invested heavily in the training of their incumbent professional and managerial workforce. This gives workers in these occupations a leg up on other workers in terms of understanding that there is going to be a continuing need for ongoing education throughout their careers. It will also be an advantage for these workers when it comes to identifying and then participating in the training that they will need to become skilled and employable in either new jobs or new industries.

Another piece of good news is that critical and emerging industries as they mature will require greater levels of professional and managerial expertise than they currently have. For example, a medical device company may only require a small number of scientists as they begin to develop the technology that they seek to market. However, as the technology gains Food and Drug Administration (FDA) approval and goes into general use, additional levels of professional and managerial expertise are required and the Merrimack Valley is positioned well to be able to provide workers with this level of expertise. Also, as companies transition from privately-held companies to publicly-listed companies additional expertise is required and, here again, the Merrimack Valley region is well positioned to be able to provide workers with the required skills. So, while some firms in the critical industries may actually be reducing their professional and managerial workforce, the emerging industries will need additional workers from this occupational component which may help to offset the reductions in force that professional and managerial workers in the Merrimack Valley region have seen.

Identifying the training needs of professional and managerial workers will enable them to make a connection with jobs in critical and, particularly, emerging industries in the region is difficult because of the skills and educational backgrounds of the majority of these workers. Training must be done on an individual basis to give workers specific skills that are required for specific jobs. Large-scale employment interventions are not generally appropriate for this group. What is necessary is the ability of the workforce development system to work in agile fashion to target specific trainings to the needs of specific workers and specific jobs within critical and emerging industries. Often times this means certification training or small scale training at the university level that will lead to the specific skills required for a new industry. For example, a well trained computer professional who wishes to enter the area of bio-informatics, a rapidly growing occupational segment, would need certification and a short term one year to eighteen month training to be able to enter this set of occupations. It is also important for workers in this level, as at any level, to be able to gain experience in the occupation and industry that they seek to enter while they are in training through internships.

For technically-skilled production and manufacturing workers, the picture is somewhat different. Many of the jobs that such workers previously held have been eliminated through a combination of automation of manufacturing processes and moving of jobs in those areas to off shore locations or lower cost areas of the United States. These jobs will not be coming back in such large numbers as we had in the past to the Merrimack Valley. However, the workforce still retains the degree of skill and experience that they had from the manufacturing industry. Therefore, the challenge is to identify new opportunities in critical and emerging industries that workers can get into, particularly in jobs that come close to paying self-sufficiency wages.

The technically-skilled manufacturing workers, like their counterparts in professional and managerial occupations, have a great deal of experience in receiving additional training. Manufacturing workers have often had to receive training sponsored by the company on new technologies, machinery and equipment, and manufacturing processes. This experience with participation in training makes members of this labor

supply pool good candidates to train for new occupations of interest in critical and emerging industries.

The most obvious place for former manufacturing workers who've been displaced, primarily from the electronics manufacturing sector, to look for new jobs is in areas of manufacturing where there is still job growth. In Chapter 5, we focused on manufacturing jobs in the precision sector where the Merrimack Valley region still appears to have a competitive advantage and where there are still job opportunities for skilled production workers. While these opportunities are relatively modest at the present time, as the economy begins to recover, firms that have stayed resilient through the economic downturn will need to hire more workers to meet increased demand, and the skilled production workforce of the Merrimack Valley region will be good candidates for these jobs. In addition, as the manufacturing labor force ages, an influx of new workers will be required.³ Also, the emerging industry of Medical Instruments and Supplies Manufacturing has the potential to offer good jobs to members of this workforce in the future as this industry matures and industry cluster develops in the Merrimack Valley and there are greater opportunities for workers. Here again the highly skilled nature of the Merrimack Valley's manufacturing workforce will be both a competitive advantage for businesses seeking to locate or expand in the region and an advantage for workers who are looking for jobs in these companies.

Members of the technically-skilled workforce of the Merrimack Valley would also do well to look at the specific requirements for occupations. For example, industry certification such as the J Standard Certification in welding is becoming more and more commonplace in the manufacturing industry. There are a number of such certifications which help to signal to employers that a worker is sufficiently skilled and prepared to go to work on the required equipment and perform the required manufacturing tasks. Many workers in the region's labor supply pool have done these tasks before, but have not received the certification. Obtaining this certification will help to strengthen their ability to re-enter employment and will also strengthen manufacturing firms in the region as they seek to obtain their own process certifications which are increasingly required to obtain lucrative contracts.

Some members of this component of the Merrimack Valley workforce are also likely to move to different industries. There is a widespread distrust of the manufacturing industry in the region among many displaced workers, particularly older workers who had been in the industry for a period of time. A wide number of opportunities are available through the regional training system to allow workers who have been displaced from employment in the manufacturing industry to obtain additional training to move into new occupations and industries. Determining the appropriate training for these opportunities is something that will have to be handled on a case-by-case basis. However, on a general basis, it is safe to say that there are opportunities worthy of exploration in other critical and emerging industries for workers who have been displaced from the manufacturing industry in the Merrimack Valley region.

Finally, there is a significant pool of lower-skilled production workers who did primarily hand work in their most recent employment in the Merrimack Valley. While jobs are decreasing in these areas on total, two of the emerging industries in the Merrimack Valley region, Food Products and Trucking and Warehousing, continue to employ a large number of such workers. Interestingly, these are two of the fastest growing industries in the region and both currently have significant employment opportunities and strong projections of future growth from both members of the industry and projections (from government data sources).⁴ While many of these jobs pay less than self-sufficiency wages, there are opportunities for advancement and employer-sponsored training at many of these firms that, over the long haul, may help workers move to self-sufficiency wages. Furthermore, the value of simply obtaining a job, being able to work, and potentially obtaining benefits cannot be overestimated for workers who are currently unemployed.

Many workers in this category also face multiple barriers to advancement. While occupational skills training is usually seen as the main route to advancement, for

many workers in this category, adult basic education and English for Speakers of Other Languages (ESOL) is a prerequisite for being able to enter occupational skills training. Lack of sufficient English-speaking skills is also a barrier to even minimal advancement, except to supervisor positions, and in some cases even to being able to maintain employment.

LABOR DEMAND

As noted in Chapters 4 through 6, this has been a difficult time to assess labor demand. Unemployment levels are at a recent high and there is a large supply of available workers. At the same time there are large pools of workers in the region looking for positions, meaning that businesses usually do not have to advertise positions that require filling. Furthermore, demand has decreased to such a great extent that for many businesses, there is no need to hire additional workers and layoffs have been more the rule than new hiring. It is in this environment that the Blueprint research process asked businesses about their hiring and other human resource needs.

Not surprisingly, there was quite a bit of variation across industries. In health care, for example, there were still a number of unmet human resource needs and many businesses were hiring, albeit at a lower level than they might have been two or three years ago. In manufacturing, on the other hand, many firms were not hiring at the time of the interviews and did not anticipate hiring new workers for some time to come. Any growth in demand for their products would be covered by a combination of additional hours or productivity increases in their current workforce and recalling of workers who had been laid off. This section of the report proceeds in two sections. First, we look at a number of issues that arise across most or all of the critical and emerging industries. Second, we look at issues that are specific to individual critical and emerging industries.

The most prevalent general issue uncovered by this research, not surprisingly, is the need for increased English language skills in the workforce, including both spoken and written English. Some companies do not require a strong level of English language literacy to obtain entry-level employment; in order to advance even one step up the career ladder, English language skills are an absolute requirement. Interestingly, this issue is seen across companies in our research, even though most companies interviewed stated that the majority of their jobs require at least a high school diploma or GED. Therefore, this finding comments on both the status of the K-12 education system and the workforce development system that are jointly responsible for providing residents of the region with the skills that businesses need.

Another basic education requirement that was a common concern across many industries, and is often overlooked, is the need for basic math skills. The ability to think quantitatively was discussed across a variety of industries and firms. The math skills that were being described were not necessarily high level mathematics or knowledge of formulas for specific calculations. Employers recognized and accepted the need to provide a level of training for workers on issues specific to their companies. However, as one employer told us, "even when we give them the formula, they can't do the math necessary to use it." As a component of adult basic education, mathematics was identified as a critical and overlooked component that should be addressed in future programmatic efforts.

"Soft skills" such as communication, teamwork, and interacting appropriately with supervisors and customers were identified as critical needs by most businesses. Again, this is not a surprise as it replicates findings from many other pieces of research. While many training programs (see below) include this as part of their training design, it continues to be identified as a problem by businesses. Training providers and the Merrimack Valley Workforce Investment Board (MVWIB) should work closely with employers in the critical and emerging industries to address these issues.

Training for workers on how to be successful supervisors was an issue that came up for a significant number of employers we interviewed. Many line-level supervisors are

workers who have been promoted due to their status as the most productive worker. However, the skills necessary to become a supervisor are significantly different from those required to be successful on the job. Companies have consistently identified this as an issue in Workforce Training Fund grant applications and the companies interviewed for the Blueprint reflected this view.

There are a number of options for addressing this problem. Many of the issues that beginning supervisors face arise from a lack of expertise in "soft skills" areas such as communications, so the enhancement of soft skills components of occupational skills training could help to address this issue up front. In addition, there are a number of "best practice" examples of modularized training curricula that can be adapted to the needs of specific businesses and a number of the region's training providers have the expertise to work with businesses to develop and provide this training.

There was a general finding that certifications are important in most of the critical and emerging industries focused on by the Blueprint. Certifications make the process of hiring employees somewhat easier for both the business and potential worker. Businesses know that a candidate has gone through a prescribed training curriculum and met a set of standards that the industry previously agreed are important. People who obtain the certification are assured, at least to a certain extent, that potential employers have determined that the skills learned in the training are closely aligned with the needs of particular businesses. Certifications make it more likely that a match between job candidate and business will be successful. It should also be noted that certifications for workers are often required in businesses which are themselves subject to certification, such as the various ISO certifications.

Finally, a number of businesses in multiple industries cited the aging of the workforce as an issue. Whether it is nurses in Health Care, toolmakers in Manufacturing, or skilled trades workers in Construction, a number of employers stated that their current workforce, particularly in skilled occupations, was aging and too few younger workers were interested in filling those jobs, resulting in a potential worker shortage in the future. In some cases, such as Construction, Trucking and Warehousing, and manufacturing, this may be due in part to a poor public perception about the employment opportunities presented by the industry. The MVWIB should work closely with businesses, trade associations, and educational organizations to provide accurate employment information and promote opportunities available in each of these industries.

In addition to the general issues, most of the critical and emerging industries had issues that were industry-specific. In Health Care, many of the businesses we interviewed identified technically-skilled occupations at the Associate's degree or certificate level as an issue. For example, radiology, mammography, or X-ray technician positions were cited by several as difficult to fill. The second issue cited frequently by Health Care businesses was the issue of the aging workforce, particularly in the nursing occupations. A large number of current and future openings in these occupations were identified. These are clearly areas of opportunity for training providers and workers to consider. Current efforts from the MVWIB and others are underway and it appears that more training efforts are needed.

Construction and Manufacturing, including Medical Instruments and Supplies Manufacturing, had three overlapping issues that many of the businesses we interviewed were concerned about: an aging workforce, difficulties attracting younger workers, and increasing technical skills requirements. The first two issues are linked. As the current workforce heads toward retirement age, replacement workers from the next generation are fewer and fewer. In many cases, businesses saw this as being due to a poor perception of their industry caused by lack of information. Businesses viewed many young people as seeing the Manufacturing and Construction industries as outdated, with poor quality of jobs, and few opportunities for advancement. Businesses felt that residents were not cognizant of the technical skills needed for many jobs in their industries. Increasing technical skills are also requiring more frequent re-education of workers in these industries.

It is important for the region to recognize that manufacturing continues to have

good jobs available in the region, but workers and training providers serving the industry will need to change for manufacturing to continue to be successful here. Workers will have to adjust to changing job requirements as product cycles change every few months instead of after a number of years. Training providers serving the Manufacturing industry will have to become more agile and responsive to business needs as well. Overall the Merrimack Valley region is well positioned to retain and even attract additional manufacturing firms and employment, but significant work remains to be done.

In Communications, businesses cited a lack of technical skills as a critical issue. Uniquely, employers in this industry also cited a lack of occupational skills training providers in the region that met their requirements for technical capacity and quality. Communications businesses also cited continuing “poaching” of workers in the industry, even through the current economic downturn. Finally, the presence of fewer formal vertical career ladders and more horizontal career “lattice” opportunities are present in the industry, making it difficult to attract and retain workers who are highly motivated for career advancement. Training providers and the MVWIB should work to align their efforts with the needs of businesses in this growing industry.

In the Food Products industry, most of the firms we interviewed were in the process of increasing their employment and were taking advantage of the Food Products cluster developing in Haverhill. Most of these companies had few human resource challenges and a number of positives for both workers and the region as a whole. The Food Products industry had the highest percentage of jobs requiring less than a college degree in formal education of all the industries in the Blueprint. Furthermore the pay is higher than one might expect with most of the businesses interviewed paying \$10 per hour and above for line level staff. Overall, the Food Products industry is one that appears to offer a number of positives that residents of the region may want to consider.

The Trucking and Warehousing industry faces a shortage in certain specific occupations, particularly those that require licenses or credentials. Individuals with Commercial Drivers Licenses (CDLs) are difficult to find, as are mechanics with a broad range of skills and experience, including experience with both gas and diesel engines. A number of positions exist in the region for workers with these skills and certifications and are likely to continue to exist in the future. Retention was also cited as an issue by businesses in this industry. Finally, recognition on the part of the region’s workforce of the technical skill needs of the trucking and warehousing was thought to be lacking. The MVWIB should seek to develop additional training capacity for truck drivers and mechanics since these are good paying jobs that are likely to continue to exist in the region for the foreseeable future.

Overall, a number of both overarching and industry-specific issues were identified during the Blueprint research. Appropriately, challenges and opportunities have been identified by businesses in each of the critical and emerging industries. The MVWIB, in its role as convener of the regional workforce development system, should work with businesses and other partners to develop and implement plans that address the identified issues. By so doing, the region’s labor force will be able to access opportunities for employment in the critical and emerging industries. Furthermore, making connections between the needs of businesses in these industries and the strengths of the region’s labor force and training system will be of critical importance in retaining businesses and employment in good jobs in the region.

REGIONAL TRAINING SYSTEM

The Merrimack Valley is fortunate to have a vibrant regional training system, with vendors of a variety of types that can provide training to the region’s residents in a number of areas. The Blueprint research identified areas where needs were being met and areas where additional growth and change in the system needs to occur.

The ability of the regional training system to meet the needs of the critical and

emerging industries in the Merrimack Valley is varied. The two largest sets of occupations for which training is currently available are health care occupations and computer usage. Health care occupations are clearly in demand in the region and the majority of training providers in this area are able to place the majority of their students, reflecting the demand for workers that businesses identified. However, certain areas of need, particularly at the technician level, do not have sufficient training options. Since this is an area of strong need for Health Care businesses in the region and these jobs pay good wages, additional training capacity for these opportunities should be developed.

Computer courses are the second area where a very large amount of training opportunities are available. However, it is important to note that most of these training opportunities are not specifically attached to one or more critical or emerging industries. This may in some cases have affected the ability of training providers to meet placement goals and may not have provided sufficiently specific training for workers. In addition, training providers should consider that many businesses consider basic and intermediate computer knowledge as a basic skill. Therefore, training providers need to identify specific types of computer training that respond to industry-identified needs or, at a minimum, a group of employers willing to hire workers who successfully complete a training program.

There are significant gaps in the training system for occupations that are most important in several critical and emerging industries. The Construction industry has relatively little representation in the post-high school training system. In addition, some businesses in this industry commented on both the quantity and quality of candidates for the construction industry coming out of the public school system. The Construction industry identified needs for both technical training in the trades and pre-apprenticeship or pre-technical skills training. The MVWIB should work with businesses and unions in the Construction industry to determine specific needs and opportunities in these areas and develop programs that address them.

A similar situation exists in the Trucking and Warehousing industry. There are relevant training programs available but there are too few to meet the demand of the industry. The case is particularly apparent for truck driving. It is difficult and expensive for training providers to increase their capacity to provide this type of training due to the cost of the necessary equipment, the space and other infrastructure requirements, and the low instructor-student ratio that is required. However, the potential benefits in terms of strong employment prospects at good wages are undeniable. A similar case can be made for mechanic training programs. It is particularly important in the case of mechanic training programs, that training providers work closely with businesses to ensure that trainees will be meet the requirements of the jobs they are being trained for.

In addition to the industry-specific issues described above, there are also several overarching training system issues that merit attention. English for Speakers of Other Languages (ESOL) training was consistently identified by businesses as a basic skill that some of their workers needed training for. There are two specific issues around ESOL training in the region. The first is the lack of ability of the regional training system to meet the demand for ESOL classes. In Lawrence alone, there are more than 1,000 people on waiting lists to enter training. Efforts are currently under way through Lawrence LiteracyWorks to address this issue, but further efforts to increase the capacity of this system to serve more people are clearly required. The second issue is that of appropriateness of the training being provided in preparing people for the world of work. Research has demonstrated that ESOL and other basic skills education is obtained more quickly and better retained when it is contextualized to real-life work situations. Experience in the region has shown that training programs which combine ESOL and/or Adult Basic Education (ABE) with occupational skills training are some of the most effective. Further efforts should be made to provide more ESOL training and to ensure that the ESOL training that is provided is contextualized to the world of work.⁵

Another overarching issue is the importance of community college degree and certificate programs in helping workers access career ladders leading to economic self-sufficiency. Such programs are in evidence and are utilized by businesses in the region to both train incumbent workers and recruit new workers. However, the workforce development system in many cases does not create close connections between a person's short-term career development plan and the longer-term training efforts required to help a person move through a career ladder to economic self-sufficiency. It is these next steps that often require interaction with community colleges (and other institutions of higher education) that seem to get lost in the system. Partners in the region's workforce development system should put policies in place to ensure that community colleges and other long-term training solutions are fully integrated into the regional training system.

There is also the overarching issue of connections between the region's training providers and businesses in the critical and emerging industries. Some training providers clearly do have close connections with employers in particular industries, but across the board, businesses in the critical and emerging industries cited little contact with partners in the regional training system. Even more disturbing was the fact that most of the interactions that were present were fairly low-level interactions around interviewing and hiring. People who participate in training programs are most likely to succeed on the job when the training program has been developed in partnership with businesses and the curriculum is fully contextualized to the actual work environment that trainees will encounter on the job. The MVWIB should ensure that all of its vendors have strong connections with businesses in the critical and emerging industries and that these businesses are intimately involved in the development of training programs and their curricula.

Finally, there is the issue of "soft skills," such as communication, teamwork, leadership, and customer service. These skills are required for nearly every occupation in every industry today. The requirement for these skills is particularly acute in health care where there is so much contact with patients and other staff members at every level. Training programs must ensure that their trainees have received not only the required licensing, certification, or degree, but also the "soft skills" that will enable them to be successful on the job.

CONCLUSION

The main function of the workforce development system is to put together resources, in the form of a regional training system, which can be applied to the labor supply in the region to meet the workforce demands of the region's critical and emerging industries. Across the critical and emerging industries, this research identified areas of unmet human resource needs. Furthermore, the research and analysis provided by the Blueprint also identify areas where the needs of the region's workforce are not being closely connected with the needs of businesses in the critical and emerging industries. While it is not the role of the Blueprint to be prescriptive in terms of precisely how to address these issues, clearly work needs to be done if businesses in the critical and emerging industries are to stay in the Merrimack Valley region and grow, while meeting the needs of the region's workforce. Some general recommendations in response to the overarching issues described above are provided in the next chapter.

ENDNOTES

1 Robert Vinson, Gene White, and Johan Uvin, *Characteristics of the Lower Merrimack Valley Workforce: Findings from an Analysis of the Backgrounds and Work Histories of Employment Service Customers, Talent Bank, Users, and Displaced Workers*, Boston, MA: Commonwealth Corporation, May 2003.

2 Erica Groshen and Simon Potter, "Has Structural Change Contributed to a Jobless Recovery?"

Current Issues in Economics and Finance, 9(8): August 2003. Federal Reserve Bank of New York.
Also, Phillip Harper, "Will your job move to India?" MSN Money Central, September 3, 2003.

3 The National Association of Manufacturers, The Manufacturing Institute, and Deloitte & Touche,
Keeping America Competitive: How a Talent Shortage Threatens U.S. Manufacturing. Washington,
DC: National Association of Manufacturers, 2003.

4 See especially, Massachusetts Division of Employment Training, "Massachusetts Detailed
Occupational Employment Projections: 1998-2008."

5 This recommendation is congruent with the recommendation of the Merrimack Valley Workforce
Investment Board that Adult Basic Education be placed within the Workforce Development system.

Chapter 9. Recommendations

I

In the previous chapter, an analysis of the strengths and weaknesses of the region's workforce and training system as they pertain to the critical and emerging industries was presented. In this chapter, specific recommendations are provided to better meet the needs of all stakeholders in the workforce development system. The recommendations come in two sections. First, overarching needs facing most or all of the critical and emerging industries are described and specific recommendations are provided. Second, general workforce development system problems are identified and recommendations to address them are provided. The identified issues and recommendations in each section should not be construed as the only important issues for the region's workforce development system to address, merely those that rose to the top during the Blueprint research.

OVERARCHING ISSUES

1. The aging workforce: A number of critical and emerging industries noted that significant portions of their workforce were aging and that replacement workers were not readily forthcoming.

Recommendation: The Merrimack Valley Workforce Investment Board (MVWIB) should promote knowledge of the employment opportunities and education and skills requirements in the critical and emerging industries to a wide constituency, particularly youth.

2. A redefinition of basic skills: The basic requirements for entry level jobs have risen dramatically over the past ten years. Candidates for entry level employment are generally expected to have excellent verbal and written skills, basic mathematics education, and a broad array of soft skills, including teamwork, communication, positive work ethic, and ability to accept supervision.

Recommendation: The MVWIB should ensure that basic skills form the foundation of training and educational efforts in the region, from high school to community colleges to occupational skills training and that soft skills are included as part of the curriculum in all training efforts in the region.

3. Lack of appropriate occupational skills training and certification programs: There are currently gaps in the region's offerings for occupational skills training to meet the needs of several critical and emerging industries.

Recommendation: Training providers and the MVWIB should use the information provided in the Blueprint to develop and enhance their programs in ways that meet the needs of critical and emerging industries. Specifically, more programs are needed to meet the needs of the Trucking and Warehousing, Manufacturing, and Communications industries.

4. Image problems: Several critical and emerging industries are hampered in their efforts to recruit workers by an outdated public perception of their industry. The rapidity of technological change in industries such as Manufacturing and Trucking and Warehousing has led to outmoded views of the occupational structure and employment needs of the industry.

Recommendation: Using the Blueprint as a tool, the MVWIB and industry partners should aggressively promote the opportunities present in each of the critical and emerging industries to the widest possible audience.

5. Insufficient career ladder opportunities: Several critical and emerging industries appear to have too few jobs available at the middle level to support career ladders

programs.

Recommendation: The MVWIB and training providers should work closely with individual businesses to identify opportunities for sector initiatives to bridge the gap from entry-level employment to jobs that pay self-sufficiency wages.

GENERAL RECOMMENDATIONS

- Align workforce development funding options with the needs of economic development to the extent possible and bring additional, flexible resources, including public and private sector funds, into the region to support economic development.
- Ensure that workforce development has a seat at the table when economic development decisions are being made so that the system is able to respond to the needs of businesses in the critical and emerging industries in the region and also to the needs of the region's workforce.
- Currently there are a number of training options serving the Health Care and, to a lesser extent, Manufacturing industries in the region, but the other critical and emerging industries are underserved. The MVWIB and its industry groups should drive the development and implementation of training programs in each of the critical and emerging industries.
- Many businesses indicated that they are worried about the quality of future worker being produced by the public schools. The MVWIB should partner its industry groups with educational efforts to ensure that business needs for worker skills are being met.
- The MVWIB should work with its training partners to ensure that additional Adult Basic Education and English for Speakers of Other Languages training is provided to more people in the region and to ensure that such training is contextualized to meet the real needs of both businesses and residents of the region.
- The workforce of the Merrimack Valley is highly skilled, with many technical, professional, and managerial workers. This is a valuable asset that economic development directors and planners in the region's municipalities can sell to businesses considering locating in the region. Provide regular and on-demand information on the users of the Valleyworks Career Center to support economic development efforts.
- Develop an enhanced higher education presence in the Merrimack Valley, particularly for Bachelor's and Master's degree granting institutions that serve the needs of the critical and emerging industries.
- Convene industry working groups of Merrimack Valley businesses in each of the critical and emerging industries to ensure the MVWIB and its programs are able to respond quickly to industry needs.
- Work closely with employers in the critical and emerging industries to develop and fund training for incumbent workers in the skill areas that meet business needs and support career advancement and wage gains for workers.
- The biggest gap in funding is for incumbent workers. The Massachusetts Workforce Training Fund has been beneficial to a number of regional companies, but the amount of money available cannot meet the need for incumbent worker training. The MVWIB should work with employers to facilitate bringing in outside resources and demonstrating the bottom-line effectiveness of training for incumbent workers at all levels.
- Agility of funding sources is critical to the success of the workforce development system. As a new 501(c) 3 nonprofit organization, the MVWIB should aggressively seek out private sources of workforce development funds to conduct pilot projects that can test some of the solutions proposed in this Blueprint.

Finally, the most critical recommendation of the Blueprint is that it continue to be updated on a regular basis to ensure that as the Blueprint is put into use , the work being done is based on the most accurate and current information that can be obtained.

Chapter 10. Watch List Industries

T

The previous sections of this report have focused on industries that are current employing large and/or rapidly growing numbers of Merrimack Valley workers. In the course of conducting this research, a number of economic development professionals alerted us to industry clusters that had the potential to emerge as large employers in the region over the next five to seven years. In addition, a number of regional and statewide efforts aimed at attracting important industries to the Commonwealth or retaining existing industries have informed this work. These industries are Biotechnology, Contract Manufacturing, Environmental Remediation, and Homeland Security.

The information that will be presented on these four industries is based on the results of interviews with economic development and planning officials in the Merrimack Valley region and from secondary data. No structured interviews were conducted with employers in these industries. The inclusion of these industries in the report reflects an important theme that has permeated the entire report: the importance of keeping a forward perspective on the region's labor market and trying to identify emerging trends early enough to partner with workforce development with economic development efforts to make these trends come to fruition in the Valley.

BIOTECHNOLOGY

Massachusetts is increasingly focusing its hopes for economic and jobs recovery on the Biotechnology industry¹ yet the industry is one that workforce development practitioners often struggle to define and identify. A basic definition of biotechnology is "using living organisms or their products for commercial purposes." A narrower and more specific definition of biotechnology is 'the commercial application of living organisms or their products, which involves the deliberate manipulation of their DNA molecules.'² A recent report on the state of the Biotechnology industry divides the Massachusetts Biotechnology industry into five segments:

- Companies with products on the market or in clinical development. In 2001, an estimated 50 Massachusetts companies employing 10,350 in Massachusetts were in this category.
- Early stage start-ups without products in clinical development. Approximately 2000 jobs in the Massachusetts biotechnology industry were in these companies in 2001.
- Biotech companies that are not involved in drug development. These companies include those working in the diagnostic side of the business or in non-drug sectors such as agriculture. In 2001, approximately 5,000 Massachusetts jobs were in this biotechnology sector.
- Specialized supplies, including clinical research organizations, laboratory supply companies, and bioinformatics firms. Approximately 7,600 Massachusetts jobs were in this category in 2001.
- Out-of-state biopharmaceutical companies with facilities based in Massachusetts. Another 5,000 Massachusetts jobs were in these companies in 2001.³

Overall, the MassBiotech 2010 report estimates that there are approximately 30,000 Massachusetts jobs in the biotechnology industry. A 2-for-1 economic multiplier, producing two dollars of economic benefit for every dollar spent, leads to an estimate of 90,000 jobs in Massachusetts in 2001 due to the Biotechnology industry.⁴ This may in fact be a conservative estimate of the positive impact of the Biotechnology industry in any region.

Due to limitations of the data sources, it is difficult to identify with any great deal of specificity the number of jobs in the biotechnology industry in the Merrimack

FIGURE 10.1 REPRESENTATIVE MERRIMACK VALLEY BIOTECHNOLOGY COMPANIES

| Company | Municipality | Number of Massachusetts Employees * |
|------------------------------------|--------------|-------------------------------------|
| Cambridge Isotope Laboratories | Andover | 150 |
| Eisai Research Institute of Boston | Andover | 165 |
| Formatech | Andover | 51 |
| Wyeth BioPharma | Andover | 2,581 |

* Source: Massachusetts BioTechnology Industry Directory
<http://www.massbio.org/directory>

Valley. Data from the Division of Employment and Training suggest that up to 2,373 jobs in 38 firms may have been in the Biotechnology industry in 2002.⁵ An analysis of the locations of Biotechnology firms in the Bay State has shown that Andover is one of the leading locations outside of Boston and Cambridge.⁶

The economic development perspective on the Biotechnology industry is both widespread and quite persuasive. Organizations ranging from the regional competitiveness councils to Massachusetts Development, to individual industrial park owners have been pushing the further development of efforts to attract and retain the Biotechnology industry in the state. The Merrimack Valley has a number of substantial assets to sell from an economic development perspective to these companies. These assets include:

- Physical assets, most notably plant facilities that could be fitted for use by Biotechnology companies. The sale of the former Lucent Technologies plant in North Andover provides one opportunity to focus on bringing more biotechnology employment to the region.⁷
- Access to transportation: as the Biotechnology industry matures into the manufacturing and marketing stages, access to transportation, including plane, rail, and trucking, will become increasingly important. The Merrimack Valley is particularly well positioned in this area.
- Proximity to research: the Biotechnology industry is driven by scientific progress that often comes from university research centers. Eastern Massachusetts is home to a large number of universities whose faculty have made commercially-important biotechnology discoveries.

The Biotechnology industry is also one of the industries of focus for the Northeast Regional Competitiveness Council, which is building on the concepts of Michael Porter⁸ to attract important industry clusters to the region. Biotechnology is included as one of the key clusters for the Merrimack Valley. Employment in the biopharmaceutical sectors in the northeast region is ranked first or second in the state.⁹

Many other entities working on economic development of the Merrimack Valley are also championing the Biotechnology industry. These include the Merrimack Valley Economic Development Council, the planning or economic development directors of a number of the region's municipalities, and the local education system.

From a workforce development perspective, the key to realizing the potential of the biotechnology industry is developing the manufacturing component of the industry in the Merrimack Valley. The majority of biotechnology firms in the Merrimack Valley region are currently in the pre-clinical trial or clinical trial stages of development. Companies at these stages employ relatively small numbers of highly educated professionals. When companies obtain Federal Drug Administration (FDA) approval to market their products, this is when the manufacturing and marketing phase begins.

When biotechnology products are approved for manufacture and distribution, a company has two options: to develop its own manufacturing capacity or to farm out the manufacture of its product to a contract manufacturer. It is at this phase that employment growth occurs and there are more opportunities for non-scientist employment in the industry. A recent report estimated that Massachusetts could add 100,000 jobs and \$1 billion in new tax revenue if it were able to attract biotech manufacturing to the state.¹⁰ The jobs that are developed in this phase of a company's expansion require generally strong levels of scientific education, along with industry-specific training. Courses ranging from 9 month certificate training to two-year associates degree programs at community colleges have been developed to meet specific industry needs and could be explored, in partnership with local biotechnology firms, for replication in the Merrimack Valley.

Regardless of whether a company chooses to manufacture its products internally or goes with a contract manufacturer, FDA approval for the manufacture of the prod-

FIGURE 10.2 BIOTECHNOLOGY RESOURCES

Massachusetts Biotechnology Council
<http://www.massbio.org>

Massachusetts Biomedical Initiative
<http://www.massbiomed.org>

ucts is attached to both the processes of manufacturing and the facility or facilities where the product is to be manufactured. This approval has an expense in terms of both financial and opportunity cost associated with it. Therefore, once a biotechnology manufacturing facility is sited in a region, it is less likely to move than other types of manufacturing facilities, which have often moved quickly to seek out cheaper sources of labor. In the case of biotechnology, the cheaper cost of labor may be offset by the expense of obtaining FDA approval for potential new facilities located in lower cost regions.

There appears to be a strong potential match between the region's workforce and the needs of the Biotechnology industry. As discussed in Chapter 3, the Merrimack Valley region has a diverse workforce with a large number of highly educated professionals, a technically skilled workforce with manufacturing experience, and a broad range of workers with entry-level skills and the potential for advancement through education. A mature Biotechnology industry will require significant numbers of workers from each of these categories. Training opportunities will need to be created to meet to enable technically skilled workers from other industries to transition to biotech manufacturing but there are successful models to do this that could be replicated.

Biotechnology has the potential to continue to offer high quality jobs in the Merrimack Valley. Workforce and economic development practitioners should work closely with biotechnology trade associations and employers to identify the workforce development needs of the industry that will help to retain biotechnology jobs in the region as the industry matures and more manufacturing jobs become available.

CONTRACT MANUFACTURING

The contract manufacturing universe is extremely broad and can include manufacturing any product for a firm that then sells the product to consumers under its own brand name. Contract manufacturing exists as an important function in a number of durable goods industries, as well as in the pharmaceutical industry. For the purposes of the Blueprint, we are restricting our consideration to the contract manufacturing of durable goods, with a particular emphasis on electronics, precision instruments, and other high technology products, in which the Merrimack Valley has long held a competitive advantage over other regions in Massachusetts and the country. Contract manufacturing for durable goods includes a large number of functions. Each firm undertakes one, some, or all of these tasks as their corporate strategy dictates. Some examples of these functions include:

- Large-scale production of products or components such as printed circuit boards.
- Small-scale production of technologically complex pieces of equipment for initial introduction.
- New product introduction (NPI) centers, where the contract manufacturer works directly with an Original Equipment Manufacturer (OEM) to develop a new product and a manufacturing strategy for that product simultaneously.
- Maintaining an OEM's repair facility and supply chain management.

Estimates of the number of people employed in the region in Contract Manufacturing are difficult to come by because employment is typically reported by the industry category of the goods that are being produced. Contract Manufacturing employment is typically included in the largest category of goods produced by each Contract Manufacturing firm. Also, many Contract Manufacturing firms employing large numbers of Merrimack Valley residents are located just outside the Merrimack Valley Workforce Investment Area, including Billerica, Lowell, and southern New Hampshire, and so are not included in the statistics reported for the region.

The Merrimack Valley region and surrounding areas contain a large number of

FIGURE 10.3 REPRESENTATIVE MERRIMACK VALLEY CONTRACT MANUFACTURING FIRMS

| Company | Municipality |
|--------------------------------|--------------|
| ACT Manufacturing | Hudson |
| Benchmark Electronics | Hudson |
| dataCon, Inc. | Burlington |
| Manufacturers Services Limited | Lowell |
| MassTech EMS | Woburn |
| Whitman Products Co. Inc. | N. Andover |

Contract Manufacturing firms. All of the “big five” Contract Manufacturing firms (Celestica, Flextronics, Jabil Circuits, Sanmina-SCI, and Solectron) have a presence in the region.¹¹ In addition, a large number of smaller contract manufacturers are also located in the region. The diversity of Contract Manufacturing firms in the region help to ensure that the industry as a whole is not overly reliant on one type of customer, leaving employment in the region vulnerable to a decline in demand from that one specific industry or, in some cases, even one specific company.

From an economic development perspective, the Contract Manufacturing industry can be quite attractive. The flexibility of the industry to focus on durable goods that are growing in commercial acceptance and demand may make it less likely that an individual Contract Manufacturing firm will fail than a particular OEM because successful contract manufacturers develop the ability to shift quickly from OEM to OEM as customer tastes change. Relatively few OEMs have this capacity to change quickly in response to changes in customer demand. Also, contract manufacturers can successfully work across a number of different industries. For example, Sanmina-SCI serves the medical device, automotive, computer, semiconductor, and defense/aerospace industries, among others.¹² A strong industrial mix makes a contract manufacturer less vulnerable to a downturn in a particular industry. Contract Manufacturing also has the capacity to build on the structural assets of the Merrimack Valley, including transportation infrastructure and manufacturing plants from the former Digital Equipment Corporation and other downsized contract and original equipment manufacturers. When demand for manufactured goods improves, there are manufacturing facilities available in the Merrimack Valley, whether the goods in demand are from previously successful industries in the region, such as precision instruments, or from emerging areas such as medical devices. It is also important to recognize that a strong contract manufacturing presence in the region can support the development of a number of other industry clusters, particularly medical devices and precision instruments.

While some have suggested that the Contract Manufacturing industry is destined to move out of relatively high cost areas such as the Merrimack Valley, there is a corporate strategy in the industry that justifies keeping a component of the industry in the region. This argument states that companies developing new products are increasing the use of contract manufacturers to make their products, while focusing their efforts on new product development.¹³ When their products first go through prototyping, companies will want to have their contract manufacturing partners in close proximity. At this stage, cost is not the determining factor. Rather, technical skill and problem-solving ability are the critical factors. As the product becomes a commodity, cost becomes the determining factor. At this point, production will generally shift to lower cost centers in the United States and internationally. However, the local contract manufacturer will continue to recruit new prototyping business with new products, from the same and other customers, coming into the pipeline and keeping the local contract manufacturer working. While this strategy may not support all of the contract manufacturing currently in the Merrimack Valley, it appears likely that contract manufacturing, like manufacturing overall, will continue to have a presence in the region for the foreseeable future.

The Contract Manufacturing industry is being widely ignored by larger state and regional economic development efforts. Whether this is due to fear of further loss of manufacturing jobs or because the industry does not easily fit into some of the economic development frameworks currently being used is not known. However, the lack of visibility of this industry may be an advantage to the region in its attempts to retain as much manufacturing employment as possible. The Merrimack Valley can focus on the innovative capabilities of the industry and its natural linkages to other critical and emerging industries in the region, particularly the medical device industry, to redevelop the region’s employment opportunities in this industry.

From a workforce development perspective, the Contract Manufacturing industry offers both opportunities and challenges. The greatest opportunity is to utilize the

strong technical skill and manufacturing experience of the region's workforce. It is important to recognize that the traditional view of contract manufacturing as piece work and hand assembly and production is highly outdated, at least for the United States portion of the industry. Contract Manufacturing in the Merrimack Valley requires the same level of highly-skilled employees that were required in manufacturing for telecommunications, computers, and precision instruments. Contract manufacturers in the Merrimack Valley focus for the most part on new product introduction, repair and rework, and low-volume, high-skill, production of technically complex products. Specific occupations in demand include engineers, testers and tester analysts, and certified soldering technicians. These occupations represent many of the same occupations that were represented in the Lucent Technologies workforce.

There are several workforce development challenges presented by the Contract Manufacturing industry. The first and most obvious challenge is that the economic downturn has had a dramatic impact on Contract Manufacturing employment in the Merrimack Valley region. Plants have been closed, workers have been laid off, and shifts have been eliminated due to decreased demand for products. However, skilled workers remain in demand at some firms and when demand returns in the industry, additional workers will be required. A second issue is that employment in the Contract Manufacturing industry is increasingly being done through temporary placement agencies. This phenomenon has only recently been employed in the Merrimack Valley region and is seen as part of the industry's response to the lack of demand for production. Such employment is frequently advertised as "temp-to-perm" (temporary to permanent), but to date few workers are known to have moved to permanent status through this method. This factor, along with the general loss of manufacturing jobs, has caused many workers to be wary of the Manufacturing industry generally and specifically of Contract Manufacturing employers.

An additional difficulty for aligning the workforce development system with the needs of Contract Manufacturing employers is the difficulty in funding incumbent worker training. The Contract Manufacturing industry was founded based on its capacity to adjust quickly to changing demands and products. This ability requires a workforce that is capable of being trained quickly as technologies and manufacturing methods change. This requirement plays into the hands of the Merrimack Valley region, where there is a pool of manufacturing workers at a variety of levels who have received a large amount of employer-sponsored training, primarily from Lucent Technologies and its predecessors. However, available funding for incumbent worker training is modest at best. To adequately meet the needs of businesses and workers in the Contract Manufacturing industry, more flexible resources that can support the training of incumbent workers will have to be identified.

With all of its challenges, the Contract Manufacturing industry offers a number of opportunities for positive engagement with the workforce development system as well. One of these opportunities is the potential for retaining high quality manufacturing jobs in the region. If OEMs have made the decision to transfer their manufacturing capabilities to contract manufacturers, then this industry offers the best opportunity to retain manufacturing employment. While contract manufacturers often pay less than comparable jobs at OEMs offer, they still pay better than many other options in the region. Another workforce development opportunity in Contract Manufacturing is the ability to provide entry-level training in areas where certification is required, such as soldering. Training for these programs in the region has been effective in helping residents obtain employment and these efforts could be expanded in partnership with the Contract Manufacturing industry.

The Contract Manufacturing industry is likely to be an important part of the future in the Merrimack Valley for some time to come. It will be important for the MVWIB and its workforce and economic development to stay current with the needs of the industry and to attempt to work closely with major Contract Manufacturing employers in the region, particularly around the needs of incumbent workers, whenever possible.

ENVIRONMENTAL REMEDIATION

The Environmental Remediation industry is one that is difficult to quantify and track because many of the companies that provide services to this industry also provide services to ancillary industries that would not be included in most measures of the Environmental Remediation industry. The Environmental industry is most broadly defined as "all revenue generating activities associated with: (1) compliance with environmental regulations; (2) environmental assessment, analysis, and protection; (3) pollution control, waste management, and remediation of contaminated property; (4) the provision of and delivery of the environmental resources of water, recovered materials, and clean energy; and (5) the technologies and activities that contribute to increased energy and resource efficiency, higher productivity, and sustainable economic growth."¹⁴ Activities that are undertaken to provide services in the Environmental Remediation sector of this industry are often performed by environmental engineering and consulting firms, which are the largest sector of the industry, although construction companies and specialized environmental remediation firms also compete in this area.

The work tasks that are performed in the Environmental Remediation industry include clean-up of brownfields sites, deleading of homes and property, and conducting assessments of the level of contamination of properties. This industry is highly regulated and most positions require state licensing. Entry-level workers are under the regular supervision of Licensed Site Professionals, a higher level position that may offer opportunities for advancement within the industry.

The Environmental industry as a whole is very strong in the Commonwealth of Massachusetts. Both sales and employment growth in the industry are growing faster in Massachusetts than in any other New England state and are also growing faster than the national average. Through the late 1990s, Massachusetts had the fastest growing environmental industry employment of any state in the nation. Reflecting overall national trends in job creation, most Massachusetts environmental jobs were located in small firms.¹⁵

Three types of firms predominate in the Environmental Remediation industry in the Merrimack Valley. First, there are firms that have been specifically created for the Environmental Remediation industry. Some of these specialize in dealing with specific types of environmental hazards, while other firms deal with a wide variety of problems. The second type of firm in this industry is the general construction firms which does Environmental Remediation as a part of its work. Firms in this sector generally employ workers from the trades who have gained the additional required state certifications for environmental remediation. Finally, there are engineering and consulting firms which generally provide coordination of large environmental remediation projects, hiring a number of subcontractors to do the hands-on component of the work. Each of these types of firms is well-represented in the Merrimack Valley.

From an economic development perspective, this industry is critical to the Merrimack Valley because there are so many properties in the region that require environmental remediation services to either be useable at all or to be made useable for a specific purpose. A property may be useable for some purposes and unusable for others, requiring additional remediation. The industry provides the knowledge and labor to bring these properties to a condition where they can be effectively utilized in a manner that supports economic development in the region. The Environmental Remediation industry also supports housing redevelopment, a critical component of economic development in the region, by providing deleading and asbestos removal services that make older housing habitable again.

Working with the Environmental Remediation industry also supports the development of a variety of other industry clusters in the region. Construction is the most notable supported by the Environmental Remediation industry, but other industries are supported as well. These include manufacturing, trucking and warehousing, and urban retail development. While the Environmental Remediation industry is not cur-

FIGURE 10.4 REPRESENTATIVE ENVIRONMENTAL REMEDIATION FIRMS

| Company | Municipality |
|----------------------------------|---------------|
| ACT Abatement | Lawrence |
| Enco | Plaistow, NH |
| Nobis Engineering, Inc. | Lawrence |
| Ransom Environmental Consultants | Newburyport |
| Brown and Caldwell | Methuen |
| Clean Harbors | North Andover |

rently being pushed by statewide economic development efforts, there are such strong advantages to local economic development that individual municipalities may wish to support Environmental Remediation industry efforts in addition to other efforts being supported statewide.

From a workforce development perspective, the Environmental Remediation industry offers quite a bit of potential and in different ways than other industries focused on in this report. For example, jobs in the Environmental Remediation industry require a shorter period of training for licensure than in most other industries. The licensing requirement is a strong advantage for workforce development because it signals to employers that people who have received training and passed the state certification test are ready to perform the jobs they were trained for. The training requirements and curriculum that are required for state licensing are clearly spelled out and agreed to by industry, sparing training providers the need to work with industry partners to develop new curriculum. Also, unlike many other trainings for licensing, the required Environmental Remediation trainings and state certification tests are available in Spanish. The certifications are also portable, meaning that workers can utilize them at a variety of locations and can "follow the work" to nearby geographic locations as cyclical changes in the construction industry occur. Also, if a worker in the industry moved to another state, the certification would be likely to provide assistance in finding employment in the environmental industry even if the certification was not recognized by the new state.

Another advantage of the Environmental Remediation industry is the relatively high wages paid for comparatively low-skilled jobs. While many of the industries and jobs described in this Blueprint focus on higher skilled workers, even for positions that do not require a Bachelor's degree, the Environmental Remediation industry offers a number of opportunities in positions that require little formal education. In these cases, the state licensing and certification is the criteria that must be met. As described in Chapter 3, there is a significant population of residents in the Merrimack Valley for whom Environmental Remediation jobs offer the best opportunities that are obtainable in the short-term.

HOMELAND SECURITY

The Homeland Security industry is one of the hottest areas of statewide economic development efforts going on now, arguably rivaled only by the Biotechnology industry. However, it is not, at least at the present time, an industry at all. Rather it is an informal grouping of firms that have the potential to benefit from the nation's renewed focus on internal security following the events of September 11, 2001. Many such firms exist in the Merrimack Valley region, which positions the region well to benefit from increased spending in this area. In addition, the close proximity of the region to a number of elite educational institutions that are likely to attract significant resources is a major benefit, particularly as those institutions begin to spin off commercially viable inventions. The combination of "brain power" and a cluster of firms that are already involved in businesses that are, or could, be part of Homeland Security is a competitive advantage for the region in this industry.

Even from this economic development perspective, however, there are a number of challenges that remain for the region to translate the promise of homeland security into economic development for the region. First, it is important to recognize that for most firms in this area, homeland security is only a relatively small part of what they do. Until funding for development and manufacture of critical technologies becomes both widespread and reliable from year to year, currently existing businesses will not be able to fully devote their efforts to this industry and new firms will not emerge. Second, the development of an industry cluster in homeland security will be hampered by the diverse technologies that are, and must be, part of the homeland security effort. Telecommunications firms such as Lucent Technologies, traditional defense contracting manufacturers such as Raytheon, medical technology

firms such as Analogic, and research and consulting firms can all be properly thought of as part of homeland security. However, these widely divergent firms may not have enough in common to spur the development of an industry cluster in the traditional economic development sense. It may be that new ways of thinking about and working with this newly emerging industry will have to be developed.

From a workforce development perspective, Homeland Security offers some of the same challenges. How do you work with an industry whose businesses are so widely divergent and may in fact have little in common in terms of occupations, skill requirements, and need for workers with specific backgrounds of education or experience? The best advice for workforce development practitioners is two-fold. First, to provide potential employees with a broad range of basic mathematics, communications, and behavioral skills that experience has shown are common to the needs of wide variety of businesses across industries and geographic locations. Second, to work with specific firms to identify their needs and develop training programs that meet those needs. By following these two strategies, workforce development has the potential to engage with the homeland security industry as it develops in the Merrimack Valley region.

CONCLUDING THOUGHTS

The most important area of consideration across all four of the "watch list" industries is that the Merrimack Valley Workforce Investment Board and its partners need to continue to research and monitor these industries to ensure that the appropriate linkages are developed to ensure that businesses will be able to meet their needs for workers and that residents of the Merrimack Valley will be able to access employment opportunities in these industries as they are developed. In addition, putting together consortia that include economic development planners, businesses, and education and training providers would seem to be a logical next step in the further development of support for these industries. Finally, in keeping with the overall "futures" perspective of this Blueprint, it will be important to continue to do labor market research that looks for the next generation of critical, emerging, and watch list industries in the region. The business climate never stands still and workforce development organizations that stand still run the risk of losing their relevance as times change. Workforce development organizations that are active participants in regional economic and business change, on the other hand, have a powerful opportunity to be participants in the overall development and improvement of the Merrimack Valley region.

ENDNOTES

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- 3 Source: The Boston Consulting Group and Massachusetts Biotechnology Council, *MassBiotech 2010: Achieving Global Leadership in the Life-Sciences Economy*. Cambridge, MA: Massachusetts Biotechnology Council, 2002.
- 4 Source: "Economic Contributions of the Biotech Industry to the U.S. Economy," prepared by Ernst & Young for the Biotechnology Industry Organization (BIO), May 2000.
- 5 Source: Massachusetts Division of Employment and Training ES-202 data.
- 6 Source: Massachusetts Biotechnology Industry directory, available online at <http://www.massbio.org/directory>
- 7 Andy Murray, "Lucent property sold," *The Eagle Tribune*, September 3, 2003, p. 1.
- 8 See especially, Michael Porter, *The Competitive Advantage of Nations*. New York: The Free Press, 1990.

- 9 Michael Porter, "Massachusetts Regions: Preliminary Competitive Profiles," Massachusetts Regional Competitiveness Councils, 2003.
- 10 The Boston Consulting Group and Massachusetts Biotechnology Council, *MassBiotech 2010: Achieving Global Leadership in the Life-Sciences Economy*. Cambridge, MA: Massachusetts Biotechnology Council, 2002.
- 11 William Lazonick, Michael Fiddy, and O. Steven Quimby. "'Grow Your Own' in the New Economy?: Skill-Formation Challenges in the New England Optical Networking Industry." In *Globalization, Universities, and Sustainable Development*. Robert Forrant and Jean Pyle, eds. London, UK: Elgar Publishing, 2002
- 12 Source: <http://www.sanmina.com>
- 13 Tim John Sturgeon, "Turn-key production networks: Industry organization, economic development, and the globalization of electronics contract manufacturing." Berkley, CA: University of California, 1999.
- 14 U.S. Department of Commerce, *Meeting the Challenge: U.S. Industry Faces the 21st Century: The U.S. Environmental Industry*, Office of Technology Policy, 1998, p.13.
- 15 Betty Diener, David Terkla, and Erick Cooke, *The Massachusetts Environmental Industry: Facing the Challenges of Maturity*. Boston, MA: University of Massachusetts Donahue Institute, 2000.

Appendix A. Occupational Matrices



These matrices contain data on the occupations generally requiring less than a Bachelor's degree in formal education in the critical and emerging industries. For each occupation, mean and median wages are reported if available. The wage data is from 2000, and is for the Merrimack Valley

region, except where noted by an * in which case the wages are based on statewide data. The employment numbers are based on matrices developed by the Division of Employment Training which contain the percentage of employment in each occupation for specific industries. Where the matrix is headed by an SIC code, the employment numbers are based on 2001 data and where the matrix is headed by a NAICS code, the employment numbers are based on 2002 data. The levels are estimates based on career ladders which contain trainable steps and salary increases within occupational pathways. Growth projections are from the Division of Employment Training and are for the time period 1998-2008.

HOSPITALS: NAICS CODE 622

| OES Code | Job Title | Mean Wage | Median Wage | Merrimack Valley Employment | Level | Growth Projection |
|----------|--|-----------|-------------|-----------------------------|-------|-------------------|
| 66008 | Nursing Aides, Orderlies, and Attendants | \$11.12 | \$11.18 | 289 | 1 | 15.6% |
| 32505 | Licensed Practical Nurses | \$18.67 | \$18.92 | 248 | 3 | 12.1% |
| 67005 | Janitors and Cleaners | \$9.95 | \$8.76 | 165 | 1 | 5.3% |
| 55347 | Office Clerks, General | \$11.60 | \$11.30 | 146 | 1 | 8.5% |
| N/A | Clinical Laboratory Technologists and Technicians | N/A | N/A | 142 | 3 | N/A |
| 55108 | Secretaries, Except Legal or Medical | \$13.54 | \$13.23 | 92 | 1 | -3.9% |
| 32919 | Radiologic Technicians and Technologists | \$20.19 | \$20.96 | 92 | 3 | 12.7% |
| 66099 | All Other Health Service Workers | N/A | N/A | 74 | 1 | 10.8% |
| 32302 | Respiratory Therapists | \$19.41 | \$19.35 | 64 | 3 | 30.8% |
| 65038 | Food Preparation Workers | \$8.55 | \$8.31 | 60 | 1 | 4.2% |
| 66014 | Psychiatric Aides | N/A | N/A | 55 | 1 | -0.2% |
| 55332 | Interviewing Clerks, except Personnel and Social Welfare | \$11.37 | \$10.87 | 50 | 1 | 12.3% |
| 55105 | Medical Secretaries | \$12.70 | \$13.64 | 50 | 2 | 7.9% |
| 65017 | Counter Attendants, Lunchroom, Coffee Shop, or Cafeteria | \$7.03 | \$7.03 | 46 | 1 | 6.2% |
| 55344 | Billing, Rate, Cost, Clerks | \$13.36 | \$12.78 | 42 | 1 | 10.6% |
| N/A | Pharmacy Assistants | \$9.30 | \$9.02 | 36 | 2 | N/A |
| 55305 | Reception & Information Clerks | \$10.39 | \$10.14 | 36 | 1 | 16.7% |
| 63047 | Guards and Watch Guards | \$12.21 | \$12.00 | 32 | 1 | 17.2% |
| 32911 | Medical Records Technicians | \$11.93 | \$11.30 | 32 | 2 | 36.3% |
| 58023 | Stock Clerks: Stockroom, Warehouse, Yard | \$11.04 | \$10.60 | 32 | 1 | 5.9% |
| 65028 | Cooks, Institution or Cafeteria | \$10.16 | \$9.84 | 32 | 2 | -1.4% |
| 57102 | Switchboard Operators | \$9.99 | \$9.78 | 32 | 1 | -19.7% |
| 55307 | Typists, including Word Processing | \$13.18* | \$12.69* | 32 | 1 | -24.7% |
| 69999 | All Other Service Workers | N/A | N/A | 28 | 1 | N/A |
| 32508 | Emergency Medical Technicians | \$12.43 | \$12.13 | 28 | 3 | 17.1% |
| 21999 | Management Support Workers, NEC | N/A | N/A | 28 | 3 | 9.6% |
| 55338 | Bookkeeping, Accounting, Auditing Clerks | \$13.14 | \$13.07 | 28 | 2 | -8.0% |
| 59999 | All Other Clerical and Administrative Support Workers | N/A | N/A | 28 | 2 | N/A |
| 55302 | Stenographers and/or Court Reporters | N/A | N/A | 23 | 2 | 21.5% |
| 85132 | Maintenance Repairers, General Utility | \$16.26 | \$16.04 | 23 | 3 | 1.6% |

SPECIAL TRADES CONTRACTORS: NAICS CODE 238

| OES Code | Job Title | Mean Wage | Median Wage | Merrimack Valley Employment | Level | Growth Projection |
|-----------------|---|------------------|--------------------|------------------------------------|--------------|--------------------------|
| 55108 | Secretaries, Except Legal or Medical | \$13.54 | \$13.23 | 108 | 1 | -3.9% |
| 55347 | Office Clerks, General | \$11.60 | \$11.30 | 105 | 1 | 8.5% |
| 55338 | Bookkeeping, Accounting, Auditing Clerks | \$13.14 | \$13.07 | 101 | 2 | -8.0% |
| 79041 | Laborers, Landscaping and Groundskeeping | N/A | N/A | 98 | 1 | 16.6% |
| 87899 | Construction Trades Workers, NEC | N/A | N/A | 91 | 1 | 8.1% |
| 89132 | Sheet Metal Workers | \$20.89 | \$21.14 | 86 | 2 | 5.3% |
| 87808 | Roofers | \$18.08* | \$17.77* | 84 | 3 | 9.2% |
| 87302 | Brickmasons, Blockmasons | \$25.89* | \$27.35* | 82 | 3 | 11.1% |
| 97102 | Truck Drivers, Heavy | \$17.53 | \$17.91 | 65 | 3 | 7.6% |
| 98313 | Electricians/Related Helpers | \$13.72* | \$12.72* | 65 | 1 | 3.4% |
| 21902 | Cost Estimators | \$27.57* | \$26.38* | 61 | 3 | 3.2% |
| 85701 | Electric and Electronic Equipment Mechanics | N/A | N/A | 55 | 3 | 11.6% |
| 97923 | Excavation>Loading Machine Operators | \$20.54* | \$19.50* | 52 | 3 | 1.6% |
| 87805 | Sheet Metal Duct Installers | N/A | N/A | 51 | 2 | 23.6% |
| 87708 | Paving, Surfacing, Tamping Operators | \$21.39* | \$19.36* | 47 | 3 | 2.5% |
| 87108 | Drywall Installers | \$20.12* | \$20.88* | 44 | 2 | 6.1% |
| 98315 | Plumbers/Related Helpers | \$12.8* | \$12.42* | 40 | 1 | 3.5% |
| 85932 | Elevator Installers and Repairers | \$26.94* | \$27.04* | 34 | 3 | 11.9% |
| 98312 | Carpenters/Related Helpers | \$11.88* | \$11.05* | 33 | 1 | 1.2% |
| 85702 | Telephone & Cable Television Line Installer and Repairers | \$22.16* | 23.27* | 32 | 2 | 22.5% |
| 87311 | Concrete Finishers/Cement Masons/Terrazo Workers | N/A | N/A | 31 | 2 | 0.4% |
| 98311 | Brick/Stone Mason Helpers | \$16.31* | \$15.56* | 29 | 1 | 3.1% |
| 97938 | Grader/Bulldozer/Scraper Operators | N/A | N/A | 27 | 3 | 2.8% |
| 87802 | Insulation Workers | \$16.23* | \$13.95* | 25 | 1 | 6.0% |
| 87814 | Structural Metal Workers | N/A | N/A | 25 | 2 | 1.0% |
| 85799 | Electric/Electromechanical Equipment Mechanics, NEC | N/A | N/A | 20 | 3 | 10.4% |
| 87314 | Reinforcing Metal Workers | \$26.39* | \$25.52* | 20 | 2 | 0.5% |
| 85132 | Maintenance Repairers, General Utility | \$16.26 | \$16.04 | 20 | 3 | 1.6% |
| 85123 | Millwrights | \$30.50 | \$35.38 | 19 | 3 | -0.4% |
| 87803 | Hazardous Material Removal Workers | \$15.58 | \$14.97 | 19 | 2 | 16.5% |
| 97105 | Truck Drivers, Light | \$11.59 | \$10.89 | 19 | 2 | 12.4% |
| 87317 | Plasters and Stucco Masons | \$29.93* | \$27.20* | 19 | 2 | 13.7% |
| 87817 | Fence Erectors | \$18.28* | \$18.27* | 19 | 1 | 8.4% |
| 87111 | Tapers | \$26.29* | \$29.00* | 16 | 2 | 6.8% |
| 85999 | All Other Mechanics, Installers, and Repairers | N/A | N/A | 15 | 2 | 6.4% |
| 98319 | Construction Trades Helpers, NEC | N/A | N/A | 15 | 1 | -5.3% |
| 58023 | Stock Clerks: Stockroom, Warehouse, Yard | \$11.04 | \$10.60 | 14 | 1 | 5.9% |
| 87811 | Glaziers | \$18.91* | \$16.47* | 12 | 3 | 7.2% |
| 22505 | Electrical and Electronic Engineering Technicians and Technologists | N/A | N/A | 12 | 3 | 7.6% |
| 87608 | Floor Sanding Machine Operators | \$12.74* | \$9.98* | 12 | 2 | 16.5% |
| 87305 | Stonemasons | \$21.38* | \$23.02* | 10 | 3 | 13.4% |
| 98316 | Roofers Helpers | \$13.35* | \$13.66* | 10 | 1 | 3.8% |
| 85314 | Mobile Heavy Equipment Mechanics | \$19.31* | \$19.15* | 10 | 3 | 5.4% |
| 87605 | Floor Layers, Except Carpet/Wood/Hard Tile | \$18.67* | \$16.71* | 10 | 2 | 14.0% |
| 55341 | Payroll and Timekeeping Clerks | \$15.34 | \$15.05 | 9 | 1 | -8.6% |
| 87308 | Hard Tile Setters | \$19.19* | \$19.36* | 8 | 2 | 8.8% |
| 87602 | Carpet Installers | \$20.58* | \$21.97* | 8 | 2 | 1.1% |

SPECIAL TRADES CONTRACTORS: NAICS CODE 238 (CONTINUED)

| OES Code | Job Title | Mean Wage | Median Wage | Merrimack Valley Employment | Level | Growth Projection |
|----------|------------------------------------|-----------|-------------|-----------------------------|-------|-------------------|
| 87902 | Earth Drillers, Except Oil and Gas | \$18.48* | \$18.62* | 8 | 3 | 2.0% |
| 92998 | Machine Operators/Tenders, NEC | N/A | N/A | 8 | 1 | -0.2% |
| 93914 | Welders and Cutters | \$15.62 | \$15.28 | 8 | 3 | -3.4% |
| 87508 | Pipelayers | \$19.66* | \$19.28* | 8 | 3 | -8.5% |
| 22514 | Drafters | N/A | N/A | 7 | 3 | -4.3% |
| 98314 | Painters/Paperhangers Helpers | \$11.52* | \$9.93* | 7 | 1 | 4.4% |
| 55305 | Reception & Information Clerks | \$10.39 | \$10.14 | 7 | 1 | 16.7% |
| 98323 | Extractive Workers Helpers | \$16.55* | \$16.64* | 6 | 1 | 5.3% |

TELEPHONE AND COMMUNICATIONS: SIC CODE 481

| OES Code | Job Title | Mean Wage | Median Wage | Merrimack Valley Employment | Level | Growth Projection |
|----------|--|-----------|-------------|-----------------------------|-------|-------------------|
| 85702 | Telephone & Cable Television Line Installer and Repairers | \$22.16* | 23.27* | 147 | 2 | 22.5% |
| 55335 | Customer Service Representatives, Utilities | \$16.26 | \$15.70 | 110 | 1 | 5.7% |
| 85502 | Central Office & PBX Installers and Repairers | N/A | N/A | 103 | 2 | 19.7% |
| 57108 | Central Offices Operators | \$14.02* | \$14.12* | 63 | 1 | -26.0% |
| 55347 | Office Clerks, General | \$11.60 | \$11.30 | 54 | 1 | 8.5% |
| | Station Installers & Repairers, Telephone | N/A | N/A | 49 | 2 | N/A |
| 85599 | Communication Equipment Mechanics, Installers, Repairers, all others | \$21.99 | \$20.91 | 29 | 2 | 2.9% |
| 85723 | Electrical Powerline Installers & Repairers | \$27.58* | \$28.70* | 25 | 3 | 0.8% |
| 59000 | All Other Clerical and Administrative Support Workers | N/A | N/A | 19 | 2 | 11.2% |
| 55338 | Bookkeeping, Accounting, Auditing Clerks | \$13.14 | \$13.07 | 18 | 2 | -8.0% |
| 53123 | Adjustment Clerks | N/A | N/A | 14 | 1 | 20.2% |
| 21900 | Management Support Workers, NEC | N/A | N/A | 13 | 3 | 9.6% |
| 55108 | Secretaries, Except Legal or Medical | \$13.54 | \$13.23 | 13 | 1 | -3.9% |
| 22505 | Electrical and Electronic Engineering Technicians and Technologists | N/A | N/A | 11 | 3 | 7.6% |
| 58008 | Production, Planning, and Expediting Clerks | \$20.92 | \$20.89 | 11 | 2 | -5.5% |
| 83002 | Precision Inspectors, Testers, and Graders | N/A | N/A | 10 | 3 | -11.9% |
| 85999 | All Other Mechanics, Installers, and Repairers | N/A | N/A | 10 | 2 | 6.4% |
| 53508 | Bill and Account Collectors | \$13.55 | \$12.97 | 10 | 1 | 26.1% |
| 55323 | Order Clerks, Materials, Merchandise, and Service | \$15.15 | \$14.20 | 8 | 1 | 0.2% |
| 58005 | Dispatchers, Except Police, Fire, Ambulance | \$15.97* | \$14.98* | 7 | 2 | 7.3% |
| 22599 | All Other Engineering and Related Technicians and Technologists | N/A | N/A | 6 | 3 | 14.5% |
| 85132 | Maintenance Repairers, General Utility | \$16.26 | \$16.04 | 6 | 3 | 1.6% |
| 58023 | Stock Clerks: Stockroom, Warehouse, Yard | \$11.04 | \$10.60 | 6 | 1 | 5.9% |
| 22514 | Drafters | N/A | N/A | 6 | 3 | -4.3% |

CABLE AND OTHER PAY TV SERVICES: SIC CODE 484

| OES Code | Job Title | Mean Wage | Median Wage | Merrimack Valley Employment | Level | Growth Projection |
|----------|---|-----------|-------------|-----------------------------|-------|-------------------|
| 55335 | Customer Service Representatives, Utilities | \$16.26 | \$15.70 | 104 | 1 | 5.7% |
| 53123 | Adjustment Clerks | N/A | N/A | 46 | 1 | 20.2% |
| 34028 | Broadcast Technicians | \$15.92* | \$13.83* | 29 | 3 | -6.7% |
| 58005 | Dispatchers, Except Police, Fire, Ambulance | \$15.97* | \$14.98* | 20 | 2 | 7.3% |
| 55108 | Secretaries, Except Legal or Medical | \$13.54 | \$13.23 | 18 | 1 | -3.9% |
| 55347 | Office Clerks, General | \$11.60 | \$11.30 | 16 | 1 | 8.5% |
| 55338 | Bookkeeping, Accounting, Auditing Clerks | \$13.14 | \$13.07 | 12 | 3 | -8.0% |
| 34026 | Camera Operators, Television, Motion Picture, and Video | \$15.16* | \$12.52* | 7 | 2 | 18.4% |
| 58023 | Stock Clerks: Stockroom, Warehouse, Yard | \$11.04 | \$10.60 | 7 | 1 | 5.9% |
| 55305 | Reception & Information Clerks | \$10.39 | \$10.14 | 7 | 1 | 16.7% |
| 22505 | Electrical and Electronic Engineering Technicians and Technologists | N/A | N/A | 7 | 3 | 7.6% |
| 53508 | Bill and Account Collectors | \$13.55 | \$12.97 | 7 | 1 | 26.1% |
| 55323 | Order Clerks, Materials, Merchandise, and Service | \$15.15 | \$14.20 | 7 | 1 | 0.2% |
| 49023 | Cashiers | \$7.68 | \$7.50 | 6 | 1 | 7.7% |
| 22599 | All Other Engineering and Related Technicians and Technologists | N/A | N/A | 5 | 3 | 14.5% |
| 21900 | Management Support Workers, NEC | N/A | N/A | 5 | 3 | 9.6% |

MEASURING AND CONTROLLING DEVICE MANUFACTURING: SIC CODE 382

| OES Code | Job Title | Mean Wage | Median Wage | Merrimack Valley Employment | Level | Growth Projection |
|----------|---|-----------|-------------|-----------------------------|-------|-------------------|
| 93999 | Assemblers, Fabricators and Hand Workers, All Others | N/A | N/A | 98 | 1 | 11.6% |
| 93114 | Electrical and Electronic Equipment Assemblers | \$11.88 | \$11.70 | 71 | 2 | -8.1% |
| | Electrical and Electronic Technicians and Technologists | N/A | N/A | 49 | 3 | N/A |
| 93905 | Electrical and Electronic Assemblers | N/A | N/A | 45 | 1 | -4.0% |
| 83002 | Precision Inspectors, Testers, and Graders | N/A | N/A | 44 | 3 | -11.9% |
| 93111 | Electromechanical Equipment Assemblers, Precision | \$15.14 | \$15.26 | 42 | 3 | -2.7% |
| 55108 | Secretaries, Except Legal or Medical | \$13.54 | \$13.23 | 32 | 1 | -3.9% |
| 89108 | Machinists | \$18.42 | \$18.82 | 26 | 3 | -4.4% |
| 22599 | All Other Engineering and Related Technicians and Technologists | N/A | N/A | 22 | 3 | 14.5% |
| 55347 | Office Clerks, General | \$11.60 | \$11.30 | 18 | 1 | 8.5% |
| 55338 | Bookkeeping, Accounting, Auditing Clerks | \$13.14 | \$13.07 | 18 | 2 | -8.0% |
| 58008 | Production, Planning, and Expediting Clerks | \$20.92 | \$20.89 | 17 | 2 | -5.5% |
| 58028 | Shipping, Receiving, Traffic Clerks | \$12.58 | \$12.10 | 17 | 1 | -1.4% |
| 22514 | Drafters | N/A | N/A | 17 | 3 | -4.3% |
| 58023 | Stock Clerks: Stockroom, Warehouse, Yard | \$11.04 | \$10.60 | 16 | 1 | 5.9% |
| 21999 | Management Support Workers, NEC | N/A | N/A | 15 | 3 | 9.6% |
| 55323 | Order Clerks | \$15.15 | \$14.20 | 12 | 1 | 0.2% |
| 85905 | Precision Instrument Repairers | \$19.92* | \$20.08* | 12 | 3 | -7.0% |
| 93100 | Precision Assemblers, All Others | N/A | N/A | 12 | 3 | -4.7% |
| | Optical Goods Workers, Precision | N/A | N/A | 9 | 3 | N/A |
| | Machine Operators, Tenders, Setters, and Set-up Operators | N/A | N/A | 9 | 2 | N/A |
| 98700 | Freight, Stock, Material Movers, Hand | \$10.94 | \$10.63 | 8 | 1 | -7.2% |

MEASURING AND CONTROLLING DEVICE MANUFACTURING: SIC CODE 382 (CONTINUED)

| OES Code | Job Title | Mean Wage | Median Wage | Merrimack Valley Employment | Level | Growth Projection |
|----------|---|-----------|-------------|-----------------------------|-------|-------------------|
| 89199 | Precision Metal Workers, All Others | N/A | N/A | 8 | 3 | -15.1% |
| 67005 | Janitors and Cleaners | \$9.95 | \$8.76 | 8 | 1 | 5.3% |
| 93902 | Machine Assemblers | N/A | N/A | 8 | 3 | -16.5% |
| 91502 | Numerical Control Machine Tool Operators and Tenders | N/A | N/A | 8 | 2 | 9.3% |
| 89132 | Sheet Metal Workers | \$20.89 | \$21.14 | 7 | 2 | 5.3% |
| 91117 | Machine Tool Cutting Operators and Tenders, Metal and Plastic | N/A | N/A | 7 | 2 | -11.6% |
| 91105 | Lathe and Turning Machine Tool Setters and Set-up Operators | N/A | N/A | 7 | 2 | -17.4% |
| 59000 | All Other Clerical and Administrative Support Workers | N/A | N/A | 7 | 2 | 11.2% |
| 85132 | Maintenance Repairers, General Utility | \$16.26 | \$16.04 | 7 | 3 | 1.6% |
| 56011 | Computer Operators, Except Peripheral Equipment | \$19.23 | \$19.86 | 7 | 2 | -26.1% |

FOOD MANUFACTURING: NAICS CODE 622

| OES Code | Job Title | Mean Wage | Median Wage | Merrimack Valley Employment | Level | Growth Projection |
|----------|---|-----------|-------------|-----------------------------|-------|-------------------|
| 97947 | Industrial Truck and Tractor Operators | \$13.70 | \$13.23 | 29 | 3 | 5.1% |
| 89808 | Food Batchmakers | \$12.74 | \$12.49 | 25 | 1 | 5.6% |
| 65099 | Food Service Workers, NEC | N/A | N/A | 23 | 1 | 7.0% |
| 21900 | Management Support Workers, NEC | N/A | N/A | 22 | 3 | 9.6% |
| 55108 | Secretaries, Except Legal or Medical | \$13.54 | \$13.23 | 22 | 1 | -3.9% |
| 55338 | Bookkeeping, Accounting, Auditing Clerks | \$13.14 | \$13.07 | 21 | 3 | -8.0% |
| 55347 | Office Clerks, General | \$11.60 | \$11.30 | 21 | 1 | 8.5% |
| 83005 | Inspectors, Testers, Weighers, Graders | \$17.25 | \$17.45 | 20 | 3 | -19.3% |
| 85132 | Maintenance Repairers, General Utility | \$16.26 | \$16.04 | 18 | 3 | 1.6% |
| 92917 | Cooking Machine Operators, Food/Tobacco | N/A | N/A | 17 | 2 | -12.7% |
| 92944 | Cutting and Slicing Machine Operators and Tenders | \$13.15 | \$12.55 | 16 | 2 | -4.4% |
| 93956 | Assemblers and Fabricators, Except Machinery/Electric/Precision | N/A | N/A | 15 | 1 | -3.1% |
| 53123 | Adjustment Clerks | N/A | N/A | 12 | 1 | 20.2% |
| 92921 | Roasting and Drying Operators and Tenders, Food and Tobacco | N/A | N/A | 12 | 2 | -13.0% |
| 55323 | Order Clerks | \$15.15 | \$14.20 | 11 | 1 | 0.2% |
| 92997 | Machine Setters/Setup Operators, NEC | N/A | N/A | 11 | 2 | 3.6% |
| 58023 | Stock Clerks: Stockroom, Warehouse, Yard | \$11.04 | \$10.60 | 11 | 1 | 5.9% |
| 89899 | Precision Food and Tobacco Workers, NEC | N/A | N/A | 11 | 2 | 9.0% |
| 92998 | Machine Operators and Tenders, NEC | N/A | N/A | 10 | 2 | -0.2% |

MEDICAL INSTRUMENTS AND SUPPLIES MANUFACTURING: SIC CODE 384

| OES Code | Job Title | Mean Wage | Median Wage | Merrimack Valley Employment | Level | Growth Projection |
|----------|---|-----------|-------------|-----------------------------|-------|-------------------|
| 92721 | Sewing Machine Operators, Non-Garment | \$9.65 | \$8.77 | 43 | 1 | -20.1% |
| 93114 | Electrical and Electronic Equipment Assemblers | \$11.88 | \$11.70 | 43 | 2 | -8.1% |
| 92974 | Packaging and Filling Machine Operators and Tenders | \$10.55 | \$9.99 | 37 | 2 | 3.2% |
| 22505 | Electrical and Electronic Engineering Technicians and Technologists | N/A | N/A | 37 | 3 | 7.6% |
| 55338 | Bookkeeping, Accounting, Auditing Clerks | \$13.14 | \$13.07 | 34 | 2 | -8.0% |
| 58008 | Production, Planning, and Expediting Clerks | \$20.92 | \$20.89 | 34 | 2 | -5.5% |
| 55347 | Office Clerks, General | \$11.60 | \$11.30 | 34 | 1 | 8.5% |
| 53123 | Adjustment Clerks | N/A | N/A | 34 | 1 | 20.2% |
| 89108 | Machinists | \$18.42 | \$18.82 | 31 | 3 | -4.4% |
| 98799 | Freight/Stock Movers, Hand, NEC | N/A | N/A | 29 | 1 | -7.2% |
| 55323 | Order Clerks | \$15.15 | \$14.20 | 29 | 1 | 0.2% |
| 58023 | Stock Clerks: Stockroom, Warehouse, Yard | \$11.04 | \$10.60 | 29 | 1 | 5.9% |
| 21999 | Management Support Workers, NEC | N/A | N/A | 26 | 3 | 9.6% |
| | Science and Mathematics Technicians | N/A | N/A | 26 | 3 | N/A |
| 85110 | Industrial Machinery Mechanics | \$18.04 | \$17.38 | 23 | 3 | -4.1% |
| 89199 | Precision Metal Workers, All Others | N/A | N/A | 23 | 3 | -15.1% |
| 93953 | Grinders and Polishers, Hand | \$13.42* | \$13.10* | 23 | 2 | -6.2% |
| 91117 | Machine Tool Cutting Operators and Tenders, Metal and Plastic | N/A | N/A | 20 | 2 | -11.6% |
| 85132 | Maintenance Repairers, General Utility | \$16.26 | \$16.04 | 20 | 3 | 1.6% |
| 67005 | Janitors and Cleaners | \$9.95 | \$8.76 | 20 | 1 | 5.3% |
| 22514 | Drafters | N/A | N/A | 20 | 3 | -4.3% |
| 98999 | Helpers/Laborers/Movers, NEC | N/A | N/A | 17 | 1 | 1.6% |
| 93947 | Industrial Truck and Tractor Operators | \$13.70 | \$13.23 | 17 | 3 | 5.1% |
| 91505 | Combination Machine Tool Setters, set-up operators | N/A | N/A | 17 | 2 | -2.7% |
| 89102 | Tool and Die Makers | \$22.30 | \$23.20 | 14 | 3 | -12.1% |

TRUCKING AND WAREHOUSING: SIC CODE 42

| OES Code | Job Title | Mean Wage | Median Wage | Merrimack Valley Employment | Level | Growth Projection |
|----------|---|-----------|-------------|-----------------------------|-------|-------------------|
| 97102 | Truck Drivers, Heavy | \$17.53 | \$17.91 | 437 | 3 | 7.6% |
| 98999 | Helpers/Laborers/Movers, NEC | N/A | N/A | 63 | 1 | 1.6% |
| 55347 | Office Clerks, General | \$11.60 | \$11.30 | 41 | 1 | 8.5% |
| 58023 | Stock Clerks: Stockroom, Warehouse, Yard | \$11.04 | \$10.60 | 41 | 1 | 5.9% |
| 58028 | Shipping, Receiving, Traffic Clerks | \$12.58 | \$12.10 | 27 | 1 | -1.4% |
| 58005 | Dispatchers, Except Police, Fire, Ambulance | \$15.97* | \$14.98* | 21 | 2 | 7.3% |
| 55338 | Bookkeeping, Accounting, Auditing Clerks | \$13.14 | \$13.07 | 18 | 2 | -8.0% |
| 85311 | Bus, Truck, Diesel Engine Mechanics | \$17.22 | \$17.07 | 15 | 3 | 6.5% |
| 55344 | Billing, Rate, Cost, Clerks | \$13.36 | \$12.78 | 9 | 3 | 10.6% |
| 98902 | Hand Packers and Packagers | \$8.07 | \$7.97 | 9 | 1 | 11.6% |
| 55108 | Secretaries, Except Legal or Medical | \$13.54 | \$13.23 | 9 | 1 | -3.9% |
| 57311 | Couriers & Messengers | \$9.34 | \$9.74 | 8 | 1 | 3.3% |
| 98700 | Freight, Stock, Material Movers, Hand | \$10.94 | \$10.63 | 7 | 1 | -7.2% |
| 85132 | Maintenance Repairers, General Utility | \$16.26 | \$16.04 | 5 | 3 | 1.6% |
| 55305 | Reception & Information Clerks | \$10.39 | \$10.14 | 5 | 1 | 16.7% |

Appendix B.

Merrimack Valley Workforce Investment Board Blueprint Committee

| | |
|-----------------------------|--|
| Joseph J. Bevilacqua, Chair | Merrimack Valley Chamber of Commerce |
| Gaylord Burke | Merrimack Valley Planning Commission |
| Thomas Galligani | City of Lawrence |
| Robert Halpin | Merrimack Valley Economic Development Council |
| Louis Minicucci | Minco Corporation |
| Eugene O'Neill | City of Haverhill |
| Mike Qualter | Merrimack Valley Planning Commission |
| Laura Ruizdeluzuriaga | RDL Solutions |
| Karen Sarkisian | Whittier Regional Vocational Technical High School |
| Timothy Schiavoni | United Way of Merrimack Valley |

Appendix C. Survey Protocol

EMPLOYER INTERVIEW PROTOCOLS

Date: ___ / ___ / ___

Name of Interviewee(s): _____

Title(s): _____

Company: _____

Address: _____

Phone: _____ e-mail: _____

1. About how many people are employed in your company today? [if distinct branches or divisions, prompt for employment in the Merrimack Valley] _____

2. Can you tell me what percentage of all positions at your company require candidates to have different education levels, from less than a high school degree on up to graduate degrees. I'm going to read you a list of 5 categories. Please tell me what percent of all positions require candidates to have these educational levels: (numbers are ok too, if that's easier)

- a. Less than high school degree or GED _____
- b. High school degree or GED only _____
- c. Associates (2 year) degree _____
- d. Bachelors (4 year) degree _____
- e. Masters degree or higher _____

3. For the next four questions, we would like to get some information on positions in your company that do not require a four year college degree. The positions we are most interested in are those that employ the largest number of people in your company and those that are experiencing growth.

[Complete the chart on the next page]

| Position Title | Critical Degrees, Credentials, or Skills | Salary Range | Turnover | What are the typical paths for advancement from this position to higher level jobs? |
|----------------|---|--------------|----------|---|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |

4. During the past month, how many position openings would you say you have had for jobs that require less than the Bachelor's degree? _____

Comments: _____

5. Now, I'd like know about the reasons for these openings. Again, I'm going to read you a list of 5; please estimate how many of the openings you just told me about were due to each set of reasons:

- a. New business needs: _____
- b. Replacement of employees who retired: _____
- c. Replacement of employees who left for other positions: _____
- d. Replacement of employees who obtained an internal promotion: _____
- e. Other [Please describe]: _____

6. Now I want to ask you more specifically about the kinds of positions you've had openings for. Again, I'm looking for jobs requiring less than the Bachelor's degree. Could you please list the occupations and tell me the number of openings for each position in the past month?

| 6a. Position | 6b. Number of Openings |
|--------------|------------------------|
| | |
| | |
| | |
| | |
| | |
| | |

7. This next question is about how you fill openings for the jobs you've just identified. I'm going to read you a list – please let me know all of the recruitment methods you use. At the end, I'll ask you to let me know which you think are the most effective. [Check all that apply, and indicate the top two:]

| | Used | Top two | Most effective |
|-------------------------------------|-------|---------|----------------|
| a. Promotion from within | _____ | _____ | _____ |
| b. Word of mouth/employee referrals | _____ | _____ | _____ |
| c. Newspaper advertisements | _____ | _____ | _____ |
| d. Internet/Web advertisements | _____ | _____ | _____ |
| e. Career centers | _____ | _____ | _____ |
| f. College recruiting | _____ | _____ | _____ |
| g. Job fairs | _____ | _____ | _____ |
| h. Temp Agencies | _____ | _____ | _____ |
| i. Other (describe:) _____ | _____ | _____ | _____ |

8. What difficulties, if any, do you have in finding workers with particular skills or qualifications? _____

[Prompt, if needed:

| | |
|---------------------------------|-------|
| Lack of communication skills | _____ |
| Lack of high school diploma | _____ |
| Lack of industry certification | _____ |
| Lack of related work experience | _____ |
| Lack of applicants altogether | _____ |

9. What have you done to address human resource problems, such as low skills and employee turnover? _____

10. Have you worked with any of these types of organizations to fill positions or improve worker skills or education?

| | |
|---------------------|-------|
| Government agencies | _____ |
| Nonprofit agencies | _____ |
| Community colleges | _____ |
| Unions | _____ |

How would you assess the services you received from these organizations?
Excellent, Good, Fair, Poor _____

11. About what percentage of your workers live in the Merrimack Valley?

12. What is the most important thing that employers in your industry could do to help entry-level workers advance within the industry? Could more formal career ladders be built? How? What would be the obstacles and the critical needs to develop and implement career ladders?

13. What is the most critical human resource issue facing your industry, and why?

14. What issues do you think the Workforce Investment Board should be working on.

Thank you very much for your time.

Do you have any suggestions of human resource staff in other companies in your industry that I might contact to complete this survey as well? _____

If you'd like, I can request that the WIB send you a copy of the report when we're done in November.

Name: _____

Title: _____

Company Name: _____

Address: _____

City, State, Zip: _____

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Merrimack Valley Workforce Investment Board Board of Directors

| | |
|--|---|
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| Mr. Joseph J. Bevilacqua, President Merrimack Valley Chamber of Commerce Lawrence | Ms. Maria Miles, President Salisbury Chamber of Commerce, Salisbury |
| Mr. Wayne Capolupo, Chairman & CEO SPS New England, Salisbury | Mr. Thomas Minichiello, Jr., Owner Minichiello Insurance Agency, Bradford |
| Mr. Charles Carr, Executive Director Northeast Independent Living Center, Lawrence | Mr. Gary Nilsson, President Communication Workers of America, Local 1365 North Andover |
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| Mr. Arthur Chilingirian, Executive Director Department of Training and Development Lawrence | Mr. Daniel Ouellette, Executive Director Salisbury Housing Authority, Salisbury |
| Mr. Thomas Connors, President LARE Training Center Lawrence | Mr. Juan Pascual Punto Final Inc. & Galaxia Inc., Lawrence |
| Mr. John Cuneo, Director Community Action, Inc., Haverhill | Mr. William Piercy, President Greater Newburyport Chamber of Commerce & Industry, Newburyport |
| Mr. Nestor H. DeJesus, Owner DeJesus & Associates, Lawrence | Ms. Laura Ruizdeluzuriaga Walta RDL, Inc., Methuen |
| Ms. Norca Disla-Shannon, Rapid Response Coordinator DET Lawrence | Ms. Karen Sarkisian, Superintendent Whittier Regional Vocational Technical High School, Haverhill |
| Ms. Gerri Dorr, Executive Director Turning Point, Inc., Newburyport | Mr. Timothy J. Schiavoni, President/CPO United Way of the Merrimack Valley, Inc., Haverhill |
| Ms. Eileen Giordano, Director Senior Aide Program Manager Elder Services of the Merrimack Valley, Inc. Lawrence | Mr. Lester Schindel, President/CEO Merrimack Valley Hospital, Haverhill |
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| Mr. William Laspina, Director Department of Transitional Assistance Lawrence | Honorable Alan Lavender Mayor of Newburyport |
| Mr. Philip F. Laverriere, Sr., Executive Director Greater Lawrence Community Action Council Lawrence | Honorable John Guerin Mayor of Haverhill |
| Attorney Robert J. LeBlanc, Methuen | Honorable Sharon A. Pollard Mayor of Methuen |
| | Honorable David A. Hildt Mayor of Amesbury |



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