


1994

# Reuse potential Industrial Mill Complexes for Springfield, Massachusetts

UMass Amherst Center Economic Development

Follow this and additional works at: [https://scholarworks.umass.edu/ced\\_techrpts](https://scholarworks.umass.edu/ced_techrpts)

 Part of the [Economic History Commons](#), [Economic Policy Commons](#), [Growth and Development Commons](#), [Public Economics Commons](#), [Public Policy Commons](#), [Urban, Community and Regional Planning Commons](#), [Urban Studies Commons](#), and the [Urban Studies and Planning Commons](#)

---

UMass Amherst Center Economic Development, "Reuse potential Industrial Mill Complexes for Springfield, Massachusetts" (1994). *Center for Economic Development Technical Reports*. 68.

Retrieved from [https://scholarworks.umass.edu/ced\\_techrpts/68](https://scholarworks.umass.edu/ced_techrpts/68)

This Article is brought to you for free and open access by the Center for Economic Development at ScholarWorks@UMass Amherst. It has been accepted for inclusion in Center for Economic Development Technical Reports by an authorized administrator of ScholarWorks@UMass Amherst. For more information, please contact [scholarworks@library.umass.edu](mailto:scholarworks@library.umass.edu).

**REUSE POTENTIAL  
INDUSTRIAL MILL COMPLEXES  
SPRINGFIELD, MASSACHUSETTS**

**Spring 1994**

**Principal Investigators**  
**John R. Mullin, Ph.D**  
**E. Bruce MacDougall, Ph.D.**

The Center for Economic Development would like to thank the Research Assistants for their efforts.

Clare Savage  
Heather Wright  
Sarah Lavery  
Christopher Campbell  
Charlotte Maloney  
Amy Petrone

The Center for Economic Development at the University of Massachusetts, in Amherst, is part of the Landscape Architecture and Regional Planning Department, and is funded by the Economic Development Administration of the U.S. Department of Commerce, the University of Massachusetts. This study was funded in part by the City of Springfield and the Western Massachusetts Electric Company.

## TABLE OF CONTENTS

|     |                                   |    |
|-----|-----------------------------------|----|
| 1.  | Introduction                      | 5  |
| 2.  | A & P Building                    | 9  |
| 2.1 | Context                           | 9  |
| 2.2 | Site and Building Information     | 9  |
| 2.3 | Occupancy and Marketing Potential | 9  |
| 3.  | Crane Company                     | 11 |
| 3.1 | Ownership History                 | 11 |
| 3.2 | Context                           | 11 |
| 3.3 | Site and Building Information     | 11 |
| 3.4 | 21E Status                        | 12 |
| 3.5 | Occupancy and Marketing Potential | 12 |
| 4.  | Firestone Building                | 13 |
| 4.1 | Ownership History                 | 13 |
| 4.2 | Context                           | 13 |
| 4.3 | Site and Building Information     | 13 |
| 4.4 | Occupancy and Marketing Potential | 13 |
| 5.  | Gemini Building                   | 15 |
| 5.1 | Ownership History                 | 15 |
| 5.2 | Context                           | 15 |
| 5.3 | Site and Building Information     | 15 |
| 5.4 | 21E Status                        | 16 |
| 5.5 | Occupancy and Marketing Potential | 16 |
| 6.  | Indian Orchard Mills              | 18 |
| 6.1 | Ownership History                 | 18 |
| 6.2 | Context                           | 18 |
| 6.3 | Site and Building Information     | 18 |
| 6.4 | Occupancy and Marketing Potential | 18 |
| 7.  | Springfield Industrial Center     | 20 |
| 7.1 | Ownership History                 | 20 |
| 7.2 | Context                           | 20 |
| 7.3 | Site and Building Information     | 20 |
| 7.4 | Occupancy and Marketing Potential | 20 |
| 8.  | Transtex Buildings                | 22 |
| 8.1 | Ownership History                 | 22 |
| 8.2 | Context                           | 22 |
| 8.3 | Site and Building Information     | 22 |
| 8.4 | Occupancy and Marketing Potential | 23 |
| 9.  | Van Norman Buildings              | 25 |
| 9.1 | Ownership History                 | 25 |
| 9.2 | Context                           | 25 |
| 9.3 | Site and Building Information     | 25 |
| 9.4 | Occupancy and Marketing Potential | 25 |



|      |  |    |
|------|--|----|
| 10.  | Watershops   | 27 |
| 10.1 | Ownership History  | 27 |
| 10.2 | Context  | 27 |
| 10.3 | Site and Building Information                              | 27 |
| 10.4 | Occupancy and Marketing Potential                          | 28 |
| 11.  | Wireland   | 29 |
| 11.1 | Historical Significance                                    | 29 |
| 11.2 | Context  | 29 |
| 11.3 | Site and Building Information                              | 29 |
| 11.4 | Occupancy and Marketing Potential                          | 30 |
| 12.  | Conclusion   | 31 |
|      | Bibliography   | 32 |
|      | Appendix 1. Summary of Zoning Ordinance District Standards | 33 |
|      | Appendix 2. Estimated Demolition Costs                     | 35 |

## LIST OF FIGURES

|            |   |    |
|------------|---|----|
| Figure 1   | Location of Study Sites                   | 8  |
| Figure 2.  | A&P Building Photographs                  | 10 |
| Figure 2.1 | A&P Building Site Map                     | 10 |
| Figure 3.  | Crane Company Building Photographs        | 12 |
| Figure 4.  | Firestone Building Photographs            | 14 |
| Figure 4.1 | Firestone Building Site Map               | 14 |
| Figure 5.  | Gemini Building Photographs               | 16 |
| Figure 5.1 | Gemini Building Site Map                  | 17 |
| Figure 6.  | Indian Orchard Mills Photographs          | 19 |
| Figure 7.  | Springfield Industrial Center Photographs | 21 |
| Figure 8.  | Transtex Buildings Photographs            | 23 |
| Figure 8.1 | Transtex Buildings Site Map               | 24 |
| Figure 9.  | Van Norman Buildings Photographs          | 26 |
| Figure 10. | Watershops Buildings Photographs          | 27 |
| Figure 11. | Wireland Buildings Photographs            | 30 |

## 1. Introduction

The City of Springfield is one of many Northeastern cities which has suffered economic hardship in recent years. Several large employers such as, Mass Mutual's Corporate Headquarters and Digital, have cutback on their operations resulting in the loss of jobs in the area.

Springfield has a number of advantages over other locations which may be used to attract new industries. Relative to most Northeastern cities, Springfield has a low cost of living which is also reflected in the cost of doing business. The region benefits from a highly skilled workforce and is in close proximity to a number of noteworthy educational establishments. Locationally, Springfield is served by a number of major roads and rail systems(see Figure 1) and is located fifteen miles north of the region's second largest airport, Bradley International, in Connecticut.

The economic base of Springfield has traditionally been resource related industries including paper and manufacturing. However, more recently, the focus has shifted increasingly to service industries and light manufacturing. The city is the major business and industrial center for Western Massachusetts, with a long tradition of manufacturing originating in the seventeenth century. It is the site of the nation's first armory. The traditional mill buildings are a testament to past industries, and should be incorporated in future economic development plans. Springfield is by no means alone in this challenge of mill reuse. Many New England cities and towns have also experienced the difficulties of adapting these buildings to suitable and economically viable activities.

### 1.1 Regional Context

Springfield is the largest municipality in Hampden County which is located in the Pioneer Valley. The Pioneer Valley is the fourth largest metropolitan region in New England, containing a mixture of small towns, rural areas and cities such as Springfield. In 1990, the population of the Pioneer Valley was 668,000, representing 11.4% of the state's population, and, 10% of its work force. Easy access from the region to New York, Boston, Albany, New Haven, and Hartford is provided by the Massachusetts Turnpike and Interstate 91.

The three counties of Hampden, Hampshire, and, Franklin, which comprise the Pioneer Valley have an average per capita income of \$14,129. This is \$3,095 less than the average statewide per capita income of \$17,224. The median household income of the Valley, \$31,868, is also below that of the statewide figure of \$36,952.

Since the early 1980s, unemployment in the region has been greater than in the state. The Pioneer Valley has experienced a loss in manufacturing jobs and an increase in service employment. Between 1983 and 1991, 12,480 manufacturing jobs were lost in the region - a change from 25% of total employment to 19%. At the same time, the service sector provided an additional 15,054 jobs, accounting for a 5% increase from 22% to 27% of all jobs.

The traditional employment in the region includes; education (Hampshire County); insurance (Hampden County); health care and manufacturing (Hampden County). Emerging industries include polymers, computer software, environmental engineering, educational services, tourism, educational services, and technologically based university spin-off industries.

### 1.2 The Study

This study provides a cross-section of mill buildings in the Springfield area. These are representative in terms of location, past and present use and surrounding activities. The analysis of



the mill buildings provides an inventory of each site, and when taken together, gives an overall picture of the existing condition and potential of Mill buildings.

The purpose of the mill revitalization study is to develop profiles of vacant or underutilized mill complexes. In the City of Springfield, ten complexes were examined; five complexes were occupied and five complexes were vacant. They are presented alphabetically in the report, and were selected by the City of Springfield Planning Department. Each profile was developed in four sections: ownership history, context, site and building information, and occupancy and marketing potential.

The ownership history section provides the date that the complex was built and lists the past and present owners as recorded in Assessor's records. The history of the complex's use and its current use and tenants, if applicable, is summarized. The historic status, if applicable, is also mentioned.

Most of the Springfield complexes were built in the late 1800s to early 1900s. Very few of them are owned by their original builder and none of them are currently being used as they were originally. A few of the complexes are eligible for historic status and one of them has formally applied for this designation.

The context section states the address of the site and describes some characteristics of the district in which it is located. This includes the three primary employer types, community facilities, and percentage of zoning types (see appendix 1. for zoning ordinance). This information was provided by the City of Springfield Planning Department Neighborhood Profiles of May 1993 (using selected data from the 1990 U.S. census) and March 1988 (using selected data from the 1980 U.S. census). The adjacent zoning of the complex is disclosed and is based upon an examination of the City's zoning ordinance. The section concludes with the property's proximity to major highways (Massachusetts Turnpike, Routes 91 and 291) and accessibility to public transportation as provided from a PVTA map.

The Springfield complexes studied are located in six of Springfield's 17 districts. The primary employer in the six districts are manufacturers. All of the districts have a mix of zoning - residential, business, and industrial; most of the complexes were located adjacent to residential and business zoned areas. All of the complexes are easily accessible to a major highway and several have good access to public transportation. The status of each complex in the master plan was not discussed because the city's master plan is still being developed.

The site and building section provides a detailed description of the complex. The site size and topography and building square footage, height, frontage, construction type, access to utilities, parking availability, evidence of vandalism, and significant features such as loading docks and elevators are listed as provided from Assessor's files and site inspections. Improvements made to the complex are described as provided in the Building Department's records and from conversations with owners, brokers or managing agents.

The Springfield complexes range in size from 19,500 to 1,200,000 square feet. The buildings are primarily of wood joist construction and one to five stories in height. All are served by public water, sewer, and utilities and have adequate parking facilities. Most of the buildings have been heated by unit heaters and almost all of the complexes have centralized heating. Floor bearing capacities and demolition and rehabilitation costs were not available for most of the complexes. None of the complexes meet the specifications of the Americans with Disabilities Act (ADA). Some complexes have reported environmental violations under M.G.L. Chapter 21E in which case a separate section describes the violations, remediations, and current status.

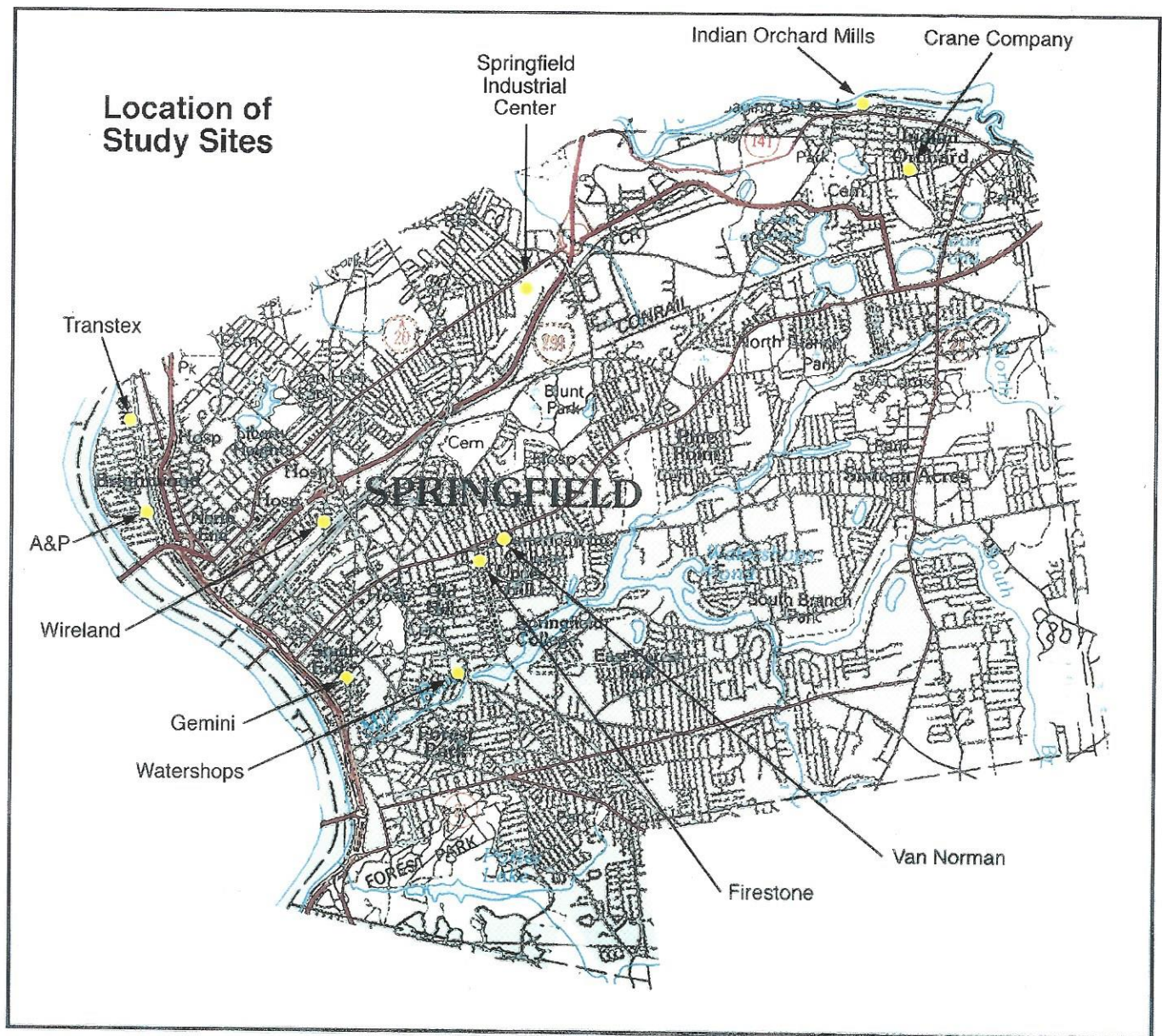
The occupancy and marketing potential section discloses either the rent charged per square foot or sales price for the complex. If leased, the occupancy rate and description of the tenants is provided. The services that are, or would be, provided to tenants by the management are also listed. However, the ultimate marketability of a property depends upon matching each site with an appropriate user who may approach their investment with an independent or different set of criteria. Some possible alternative uses for the complexes are listed. If reuse is not determined to be a viable option one alternative is to clear the sites for redevelopment, which could include some demolition (see appendix 2. for estimated demolition costs)

The Springfield complexes were leased for between \$1.00 and \$3.75 per square foot; sales prices ranged from \$1.00 to \$850,000. Those complexes that were occupied had an overall higher marketing potential because they were in better physical condition and located near other occupied businesses.

The report on each complex also includes photographs of some of the sites, and a detailed site map of the buildings as reduced from the City's block plans.



**Figure 1.**  
**Location of Study Sites**





## **2. A & P Building**

### **2.1 Context**

The A & P Building is located at 297/327 Plainfield Street in the northwest corner of the Brightwood district of Springfield. The largest proportion of employment is in manufacturing, professional services, and wholesale and retail trade. The community facilities include an elementary and secondary school, and a public library. Approximately 18% of the district's acreage are parks and open space which include Marina Park, a boat launch, and the 12 acre Kenefick Park. The district is zoned 50% residential, 40% business, and 10% industrial.

The A&P building is zoned Industrial A. The adjacent properties to the north and south are also zoned Industrial A. Properties to the east, west, and further south are zoned Business B and Business A. Properties further to the east and west are zoned Residential C and some Residential C2. As a result of this zoning, supporting business services are available nearby.

The property is less than 1/2 mile from Route 91 and 1 mile from Route 291. It is also served by PVRTA route 105 which connects the residential area to the north adjacent to the Connecticut River to the southeast corner of Forest Park in Longmeadow. This route passes the Peter Pan bus terminal and Amtrak station, Symphony Hall, the Civic Center and the Basketball Hall of Fame. The A&P building has no documented past or current environmental violations and is not located in an historic district.

### **2.2 Site and Building Information**

The assessors files for this property were not available, therefore the site and building information is not complete. The information presented was supplied by the City of Springfield Building Department and by an inspection of the site.

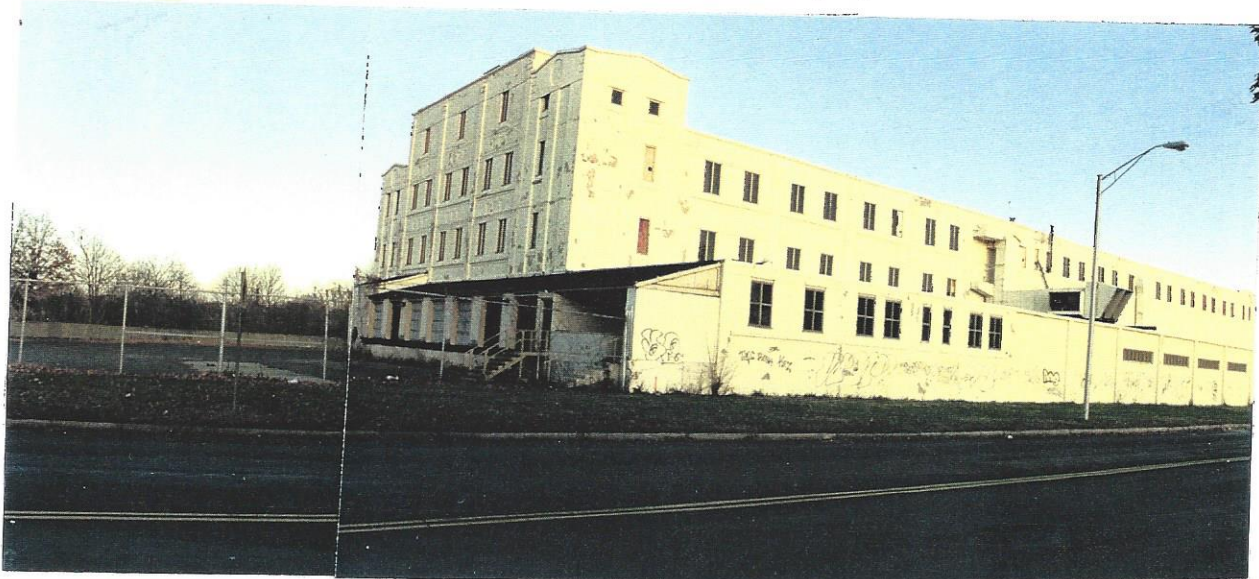
The main factory building has a floor space of 152,685 square feet. The walls and floors of the structure are reinforced concrete. The building is heated by steam and is equipped with elevators, wood and metal overhead doors and a sprinkler system.

The building previously housed an A&P bakery facility and is currently partly occupied by Lens Tex and Custom Wood Reproductions. Figure 2 is a photograph showing the A&P building at present.

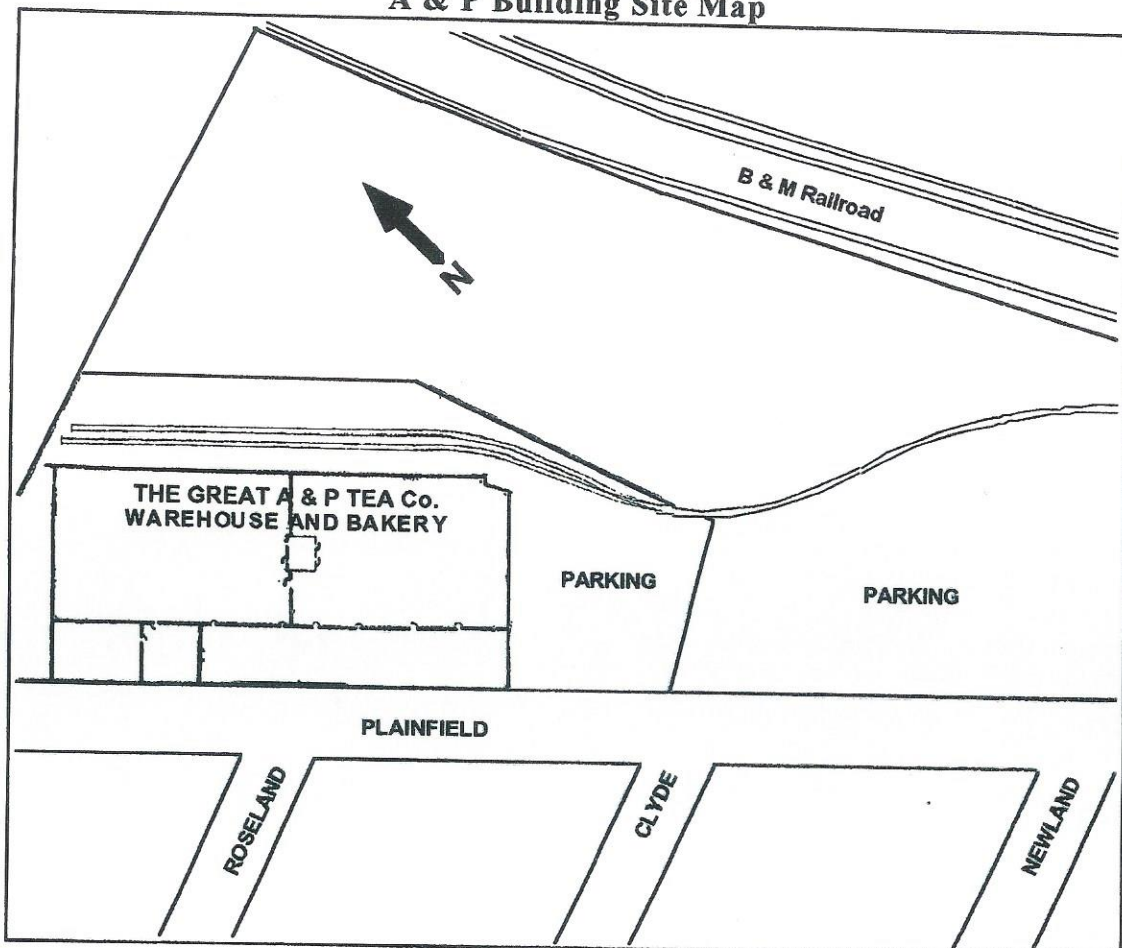
### **2.3 Occupancy and Marketing Potential**

The A & P Building is bank-owned; estimated sales price or lease information were not available. The site has relatively good marketing potential in light of other building studied and existing services and infrastructure located in the vicinity. It is located near an area of urban renewal by the BayState Medical Center, which is expanding and becoming an office park. It has adequate on-site parking and excellent access to Routes 91, 291 and the Massachusetts Turnpike. It is buffered from the neighboring residential areas by Plainfield Street which is 4 lanes wide and well trafficked. The building is in good condition but does not comply with ADA regulations. The building could be used for incubator businesses and storage. There are manufacturers in the area and this could be a viable alternative use.

**Figure 2.**  
**A & P Building Photographs**



**Figure 2.1**  
**A & P Building Site Map**





### **3. Crane Company**

#### **3.1 Ownership History**

The complex, presently known as the Crane Company buildings, was built in 1874 to house the Chapman Valve Company which was founded in Boston in 1870 and moved to Springfield in 1847. The company melted iron, steel and brass, and manufactured hydrants, pipe fittings and valves. In 1966, Chapman Valve became the Crane Company, the current owners of the complex. The buildings are partially occupied at present by several small businesses; Cans R Us Redemption Center, Indian Orchard Fuels, Inc.; Crafters Outlet, Bill's Tire Service and Standard Paper.

#### **3.2 Context**

The Crane Company buildings are located at 165 Pinevale Street in the Indian Orchard district which is in the northeast corner of Springfield. The most employment is provided by manufacturers, wholesale and retail trade, and professional services. The community facilities include an elementary and high school, public library, fire station and fire training center. Approximately 8% of the district's acreage is comprised of parks and open space which include 18 acres of conservation land and Hubbard Park (38 acres). The district has been zoned as 63% residential, 15% business, and 22% industrial.

The buildings are zoned Industrial A; they are located on a southeast "spur" of Industrial A zoning which extends across the north of Springfield adjacent to Interstate Route 291. The immediate areas to the north, south, and west of the property are zoned Business B; the area to the east is zoned Commercial A. This mixed zoning provides basic support services such as stationery and printing services and small restaurants. Nearby areas are zoned Residential B and some Residential A.

The property is slightly over 3 miles from Rt. 291 and 4 miles from the Massachusetts Turnpike. It is not located in a flood plain and it has no historic status.

#### **3.3 Site and Building Information**

The Crane Company buildings occupy a land mass of 15.9 acres. The complex consists of eighteen buildings which occupy 456,084 square feet and which range between one and three stories in height. The site has a frontage of 1,713 linear feet and the topography is level. The road is paved and has curbs, gutters and a sidewalk.

The construction type of the buildings is wood joist with brick as the exterior wall material. The complex was served by public utilities; water, sewer, electric and gas. However, these utilities are disconnected at present. The building was heated by unit heaters and was equipped with a sprinkler system all of which have been removed. There are no elevators present in the complex however there are steel and wooden loading dock facilities.

The functional utility of the buildings is normal and the structures have been rehabilitated. The complex has adequate parking facilities which are located on site and off the street. The windows in most of the complex have been secured and there is evidence of vandalism, especially at the rear of the complex, where there is graffiti on many of the walls.



### 3.4 21E Status

The property has undergone several remedial procedures. In 1987, 19 underground storage tanks were excavated and removed. In 1991, an extensive quantity of friable asbestos was removed from the building interior and exterior pipe bridges. A Massachusetts Department of Engineering (DOE) survey found elevated levels of radioactivity in the ceiling and inaccessible vertical areas (e.g. behind radiators); the presumed source was a 1948 uranium fire. The DOE report stated that the radioactivity was from a uranium beta emitter which is "not particularly hazardous unless inhaled or ingested." As of October 1993, the owners had applied to the Massachusetts Department of Environmental Protection for a Waiver of Approvals which has a 60 day processing period. The site is currently classified as a non-priority site.

### 3.5 Occupancy and Marketing Potential

The Crane Company buildings have been vacant for several years. The buildings are on the market for \$1.00 and the owners would provide an environmental indemnification to the new owner. The Crane Company removed asbestos from the structures and oil tanks from the grounds and is currently waiting for a Waiver of Approvals from the DEP. The Company owns an adjacent site which was used as a landfill; it is classified as a waiver site by DEP and it has not been excavated.

In general the marketing potential is poor, even though, it has adequate on-site parking, good access to Routes 291, 91 and the Massachusetts Turnpike and good external structural condition, a substantial investment would be required to accommodate any use or tenant (see Figure 3). The heat and utilities have been disconnected from the building and there has been some roof collapse. The demolition costs are equally prohibitive; the owners have received estimates for demolition in excess of \$1 million.

Figure 3.

Crane Company Photographs



## **B. Sex**

According to the 1990 census, the region's population is divided approximately evenly between males and females. There is a slightly larger number of females overall, with this gender disparity most concentrated in the urbanized areas of Fitchburg, Gardner, Leominster, Clinton and Athol. The only town with a significantly higher proportion of males than females is Harvard, where the unusual 20-point percentage disparity is due to the predominantly male Fort Devens military base population housed there. However, the larger size of the region's female population was largely compensated for by a more rapid increase in the number of males in the population during the past decade. This trend brought all of the towns and cities with large gender differentials closer to balance by 1990.

## **C. Race**

In keeping with national trends, the Montachusett population is becoming more diverse in its racial and ethnic makeup. In 1980, whites constituted 96.3% of the population, declining to 93.5% by 1990 (see Table 5.4). By comparison, the state-wide percentage of whites was 89.8% in 1990, putting the percentage of minorities in the Montachusett Region below the state average. However, minority racial and ethnic groups represented one of the fastest growing population segments in the region, tripling from 3.8% to 11.4% of the total population during the 1980s.

While the white population grew by 7.4% during the 1980s, the black population grew 58.5% to 6,347 persons, and Asians increased by 241.1% to 3,179 persons. Hispanics number 11,067 persons within a 1990 total population of 223,865 persons. (1980 Census figures for Hispanics are not available for Montachusett towns.) Most minorities remain concentrated in the region's urban areas and their immediately surrounding towns.



According to the 1990 census, the median age for Hispanic persons in Leominster and Fitchburg, the region's largest cities, is approximately 21 years. This is more than a decade younger than the region's overall median age. This indicator points to the continuation of relatively rapid growth in the Hispanic population and to an ongoing increase in the region's racial/ethnic mix during the years ahead.

**Table 5.4: Population by Racial/Ethnic Group in Montachusett Communities: 1980 - 1990**

| Community             | 1990<br>Pop. | White  | %<br>White | Black | Any Race<br>Hispanic | Amer*<br>Indian | 1 Asian<br>Pac Isl. |
|-----------------------|--------------|--------|------------|-------|----------------------|-----------------|---------------------|
| Ashburnham            | 5433         | 5382   | 99.1       | 7     | 42                   | 7               | 24                  |
| Ashby                 | 2717         | 2703   | 99.5       | 6     | 27                   | 0               | 8                   |
| Athol                 | 11451        | 11218  | 98.0       | 58    | 102                  | 56              | 65                  |
| Ayer                  | 6871         | 5730   | 83.4       | 674   | 340                  | 39              | 217                 |
| Clinton               | 13222        | 12390  | 93.7       | 253   | 1032                 | 9               | 133                 |
| Fitchburg             | 41194        | 36847  | 89.4       | 1411  | 3957                 | 97              | 1057                |
| Gardner               | 20125        | 19201  | 95.4       | 403   | 558                  | 28              | 182                 |
| Groton                | 7511         | 7378   | 98.2       | 53    | 62                   | 15              | 58                  |
| Harvard               | 12329        | 10160  | 82.4       | 1507  | 673                  | 54              | 327                 |
| Hubbardston           | 2797         | 2778   | 99.3       | 8     | 27                   | 4               | 4                   |
| Lancaster             | 6661         | 5957   | 89.4       | 431   | 409                  | 20              | 77                  |
| Leominster            | 38145        | 35506  | 93.1       | 860   | 3161                 | 71              | 621                 |
| Lunenburg             | 9117         | 8962   | 98.3       | 60    | 88                   | 10              | 60                  |
| Petersham             | 1131         | 1105   | 97.7       | 7     | 2                    | 3               | 14                  |
| Phillipston           | 1485         | 1467   | 98.8       | 0     | 5                    | 4               | 11                  |
| Royalston             | 1147         | 1139   | 99.3       | 5     | 7                    | 0               | 3                   |
| Shirley               | 6118         | 5369   | 87.8       | 421   | 269                  | 20              | 183                 |
| Sterling              | 6481         | 6393   | 98.6       | 44    | 73                   | 18              | 21                  |
| Templeton             | 6438         | 6391   | 99.3       | 26    | 49                   | 3               | 13                  |
| Townsend              | 8496         | 8388   | 98.7       | 79    | 61                   | 4               | 18                  |
| Westminster           | 6191         | 6140   | 99.2       | 12    | 37                   | 11              | 19                  |
| Winchendon            | 8805         | 8679   | 98.6       | 22    | 86                   | 16              | 64                  |
| 1990 TOTAL:           | 223865       | 209283 | 93.5       | 6347  | 11067                | 489             | 3179                |
| 1980 TOTL:            | 202557       | 195114 | 96.3       | 4004  | NA                   | 281             | 932                 |
| % Change<br>1980-1990 | 10.5         | 7.3    |            | 58.5  |                      | 74.0            | 241.1               |

Source: U.S. Dept. of Commerce, Bureau of the Census 1990.

\* Includes Eskimos and Aleutians.

1 Includes Japanese, Chinese, Filipino, Korean, Asian Indian, Vietnamese, Hawaiian, Guamanian and other Asians.

## 5.2 Educational Levels

The percentage of Montachusett residents age 25 and over who had graduated from high school stood at 71.7% in 1980, slightly under the state average of 72.2% but above the national rate of 66.3%. The region's graduation rate improved by 10.6% over the next ten years to 82.2%. This rate significantly exceeds the nation's 1990 percentage of persons over 25 with high school degrees (75.2%) and slightly exceeds the state level of 80.0%.

All Montachusett communities experienced an improvement of at least 5% in their percentage of high school graduates during the 1980s, with the exception of Harvard which began and ended the decade with the region's highest percentages of high school graduates (1980 - 95%, 1990 - 97%). Among the communities with the most dramatic improvement in their percentage of high school graduates was Winchendon, which went from 58.5% in 1980 to 76.8% of the 1990 population over age 25 in possession of a high school degree. That is an improvement of 18% over the decade. The town of Athol also increased its percentage of high school graduates significantly from 60.5% in 1980 to 74.2% in 1990.

The larger urban population centers contain lower than average percentages of high school graduates, meaning larger absolute numbers of people in cities lacking high school degrees. Fitchburg and Leominster are the only two cities for which the 1990 census also collects data on the percentage of Hispanic high school graduates, with the data showing a significantly lower than average rate. In Fitchburg, only 40.6% of Hispanics over age 25 had high school degrees in 1990, as compared with 70.1% for the city overall. In Leominster, the corresponding rates are 44.1% for Hispanics and 75.9% for the city's total population. These rates are slightly below the national average for Hispanics.

Measuring higher education, by 1990, the percentage of Montachusett residents possessing a bachelors degree had increased to 22.7%. This level trails the comparable state-wide rate of 27.2% for persons age 25 and over in 1990, but exceeds the nation-wide rate of 20.3%.

Again, the town containing the highest percentage of four-year college graduates in 1990 was Harvard (41.5%). Towns containing the lowest percentages of four-year college graduates included Templeton (10.5%), Athol (12.1%), Clinton (13.1%), Winchendon (13.4%) and Fitchburg (13.5%). Percentages of Hispanic college graduates in Fitchburg (6.4%) and Leominster (7.6%) were again significantly lower than city-wide and regional rates. (Note: comparative data were not available for the towns of Ashby, Gardner, Hubbardston, Petersham, Phillipston, and Royalston.)



**Table 5.5: Education Status by Community in Montachusett:  
1980 - 1990**

| Community   | Persons 25+<br>% HS Grads<br>1980 | Persons 25+<br>% HS Grads<br>1990 | '80-'90<br>% Change | Persons 25+<br>% w/Bach.<br>1990 |
|-------------|-----------------------------------|-----------------------------------|---------------------|----------------------------------|
| Ashburnham  | 69.0                              | 83.1                              | 14.1                | 25.9                             |
| Ashby       |                                   | 87.9                              |                     | 19.7                             |
| Athol       | 60.5                              | 74.2                              | 13.7                | 12.1                             |
| Ayer        | 71.3                              | 81.6                              | 10.3                | 14.7                             |
| Clinton     | 65.5                              | 76.2                              | 10.7                | 13.1                             |
| Fitchburg   | 64.4                              | 70.1                              | 5.7                 | 13.5                             |
| Gardner     |                                   |                                   |                     |                                  |
| Groton      | 84.3                              | 89.2                              | 4.9                 | 41.5                             |
| Harvard     | 95.7                              | 97.0                              | 1.3                 | 47.0                             |
| Hubbardston |                                   | 87.1                              |                     | 21.1                             |
| Lancaster   | 76.1                              | 82.8                              | 6.7                 | 27.4                             |
| Leominster  | 64.4                              | 75.9                              | 11.5                | 19.1                             |
| Lunenburg   | 76.1                              | 84.4                              | 8.3                 | 27.6                             |
| Petersham   |                                   |                                   |                     |                                  |
| Phillipston |                                   |                                   |                     |                                  |
| Royalston   |                                   |                                   |                     |                                  |
| Shirley     | 70.0                              | 81.0                              | 11.0                | 19.5                             |
| Sterling    | 80.9                              | 88.4                              | 7.5                 | 32.6                             |
| Templeton   | 58.5                              | 70.8                              | 12.3                | 10.5                             |
| Townsend    | 80.4                              | 88.4                              | 8.0                 | 24.8                             |
| Westminster | 71.4                              | 85.4                              | 14.0                | 24.3                             |
| Winchendon  | 58.5                              | 76.8                              | 18.3                | 13.4                             |
| Region Avg. | 71.7                              | 82.2                              | 14.7                | 22.7                             |
| Mass. Avg.  | 72.2                              | 80.0                              | 10.8                | 27.2                             |

Source: U.S. Dept. of Commerce, Bureau of the Census 1990

### 5.3 Income Levels

#### A. Median family income

In 1989, median family income in the Montachusett region averaged \$43,577, slightly below the state-wide median family income of \$44,367 (see Table 5.6). The region's 1989 median family income represents a 174% increase from the 1979 regional level of \$15,700. The comparable state-wide median for 1979 was \$21,329. Comparison of the

state and regional median family incomes over the 1980s shows Montachusett making significant gains, ending the decade nearly even with the state median. The overall increase in income, however, masks significant variations within towns and cities in the region.

Within the region, the contrast between urban areas and wealthier small towns ranged from a high in median family income of \$60,000 in Groton, to a low of \$32,939 in Ayer. Fitchburg (\$33,357) and Athol (\$33,263) also showed relatively low median family income levels, although other urban centers such as Leominster (\$41,927) and Clinton (\$40,139) compared favorably with many of the suburban towns.

### **B. Per capita income levels**

In 1989, average per capita income for the Montachusett region was \$15,526 (see Table 5.6). This ranks the region above the national per capita income rate of \$13,546, but below the state-wide average of \$17,070. Within the region, per capita income in 1989 ranged from a high of \$22,832 in Groton to a low of \$12,140 in Fitchburg, the most populous community in the region. Again, Leominster (\$15,960) and Clinton (\$15,328) showed higher per capita income levels than other urban areas, indicating healthier local economies.

### **C. Poverty Levels**

The region's poverty level decreased during the 1980s, although not as significantly as the state-wide decline. In 1979, 8.3% of all Montachusett households had incomes below the federally determined poverty level. By 1989, the poverty level for the region as a whole had declined to 6.4%. State-wide, the poverty rate dropped from 9.8% in 1979 to 6.7% in 1989. Montachusett towns with the highest percentages of households below the poverty line in 1989 were the urban areas of Fitchburg (14%), Athol (11.7%) and Gardner (11.0%). In all three, poverty levels increased during the 1980s, in contrast to regional and



state trends. The urban areas of Leominster (7.2%) and Clinton (7.5%) showed lower percentages of households below the poverty line than other urban areas in the region. The town with the lowest poverty rate was Ashby (2.5%). In addition, 10 of the 22 towns in the region reported fewer than 5% of households below the poverty line.

**Table 5.6: Per Capita Income, Median Family Income and Poverty Level by Community in Montachusett: 1989**

| Community          | Per Capita<br>Income<br>1989 | Median<br>Household<br>1989 | Median<br>Family<br>1989 | Number<br><<br>Poverty<br>1989 | Percent<br><<br>Poverty<br>1989 |
|--------------------|------------------------------|-----------------------------|--------------------------|--------------------------------|---------------------------------|
| Ashburnham         | \$15,595.00                  | \$42,442.00                 | \$45,359.00              | 332                            | 6.2                             |
| Ashby              | \$16,611.00                  | \$46,250.00                 | \$49,310.00              | 68                             | 2.5                             |
| Athol              | \$12,444.00                  | \$27,094.00                 | \$33,263.00              | 1312                           | 11.7                            |
| Ayer               | \$14,586.00                  | \$29,326.00                 | \$32,939.00              | 596                            | 8.9                             |
| Clinton            | \$15,328.00                  | \$34,091.00                 | \$40,139.00              | 980                            | 7.5                             |
| Fitchburg          | \$12,140.00                  | \$27,101.00                 | \$33,357.00              | 5461                           | 14                              |
| Gardner            | \$13,207.00                  | \$28,035.00                 | \$35,430.00              | 2092                           | 11                              |
| Groton             | \$22,832.00                  | \$55,169.00                 | \$60,000.00              | 286                            | 3.8                             |
| Harvard            | \$17,937.00                  | \$47,299.00                 | \$47,481.00              | 373                            | 3.9                             |
| Hubbardston        | \$15,575.00                  | \$42,650.00                 | \$46,853.00              | 111                            | 4                               |
| Lancaster          | \$14,619.00                  | \$41,552.00                 | \$46,924.00              | 306                            | 5.5                             |
| Leominster         | \$15,960.00                  | \$35,974.00                 | \$41,927.00              | 2713                           | 7.2                             |
| Lunenburg          | \$19,166.00                  | \$43,199.00                 | \$49,625.00              | 322                            | 3.5                             |
| Petersham          | \$17,542.00                  | \$39,063.00                 | \$45,855.00              | 61                             | 5.8                             |
| Phillipston        | \$13,216.00                  | \$35,573.00                 | \$40,069.00              | 114                            | 7.7                             |
| Royalston          | \$12,421.00                  | \$33,333.00                 | \$36,923.00              | 72                             | 6.3                             |
| Shirley            | \$15,581.00                  | \$38,377.00                 | \$43,372.00              | 272                            | 4.8                             |
| Sterling           | \$17,830.00                  | \$49,345.00                 | \$53,339.00              | 299                            | 4.6                             |
| Templeton          | \$13,347.00                  | \$34,395.00                 | \$38,074.00              | 284                            | 4.6                             |
| Townsend           | \$15,694.00                  | \$46,910.00                 | \$50,629.00              | 256                            | 3                               |
| Westminster        | \$16,798.00                  | \$46,292.00                 | \$51,986.00              | 274                            | 4.4                             |
| Winchendon         | \$13,143.00                  | \$32,362.00                 | \$35,828.00              | 790                            | 9.1                             |
|                    |                              |                             |                          | 17374                          |                                 |
| Region 1989<br>avg | \$15,526.00                  | \$38,901.45                 | \$43,576.00              |                                | 7.7                             |
| Mass. 1989<br>MFI  |                              |                             | \$44,367.00              |                                |                                 |
| Mass. 1979<br>MFI  |                              |                             | \$21,329.00              |                                |                                 |

Sources: U.S. Department of Commerce, Bureau of the Census 1990.

## 5.4 Size of the labor force

According to census figures, the total size of the labor force in the Montachusett region measured in terms of persons sixteen years and older stood at 172,680 in 1990. The census measured the civilian labor force at 113,407.

In 1989, the Massachusetts Department of Employment and Training measured total employment in the region at 78,482 jobs (see Table 5.7). This represents a total net increase of 5,997 jobs over the 1980 employment level of 72,512 jobs, or an 8.2% rate of job growth over the decade. By comparison, the census data for the decade showed a corresponding growth rate in the state-wide civilian labor force of 7.8% during the 1980s.

**Table 5.7: Job Gain/Loss by Community in Montachusett: 1980 - 1989**

| Community   | 1980 #<br>Establ. | 1989 #<br>Establ. | % Gain<br>'80-'90 | 1980 Tot.<br>Empl. | 1989 Tot.<br>Empl. | # Jobs +-<br>'80-'90 | % Job +-<br>'80-'90 |
|-------------|-------------------|-------------------|-------------------|--------------------|--------------------|----------------------|---------------------|
| Ashburnham  | 61                | 88                | 44.3              | 723                | 735                | 12                   | 1.7                 |
| Ashby       | 33                | 63                | 90.9              | 129                | 243                | 114                  | 88.4                |
| Athol       | 209               | 269               | 28.7              | 4956               | 4012               | -944                 | -19.0               |
| Ayer        | 178               | 259               | 45.5              | 4714               | 6408               | 1694                 | 35.9                |
| Clinton     | 270               | 317               | 17.4              | 5315               | 4852               | -463                 | -8.7                |
| Fitchburg   | 906               | 1089              | 20.2              | 17469              | 18217              | 748                  | 4.3                 |
| Gardner     | 401               | 459               | 14.5              | 9886               | 8950               | -936                 | -9.5                |
| Groton      | 111               | 176               | 58.6              | 1485               | 1729               | 244                  | 16.4                |
| Harvard     | 75                | 135               | 80.0              | 628                | 962                | 334                  | 53.2                |
| Hubbardston | 27                | 58                | 114.8             | 213                | 514                | 301                  | 141.3               |
| Lancaster   | 88                | 120               | 36.4              | 1536               | 2297               | 761                  | 49.5                |
| Leominster  | 745               | 1090              | 46.3              | 14051              | 16505              | 2454                 | 17.5                |
| Lunenburg   | 109               | 177               | 62.4              | 1105               | 1769               | 664                  | 60.1                |
| Petersham   | 25                | 32                | 28.0              | 94                 | 137                | 43                   | 45.7                |
| Phillipston | 8                 | 15                | 87.5              | 71                 | 106                | 35                   | 49.3                |
| Royalston   | 7                 | 10                | 42.9              | 40                 | 52                 | 12                   | 30.0                |
| Shirley     | 62                | 97                | 56.5              | 1159               | 1100               | -59                  | -5.1                |
| Sterling    | 95                | 156               | 64.2              | 807                | 1132               | 325                  | 40.3                |
| Templeton   | 91                | 117               | 28.6              | 1298               | 1219               | -79                  | -6.1                |
| Townsend    | 82                | 151               | 84.1              | 2099               | 2943               | 844                  | 40.2                |
| Westminster | 71                | 133               | 87.3              | 2858               | 2831               | c                    | -0.9                |
| Winchendon  | 161               | 203               | 26.1              | 1876               | 1769               | -107                 | -5.7                |
| Totals:     | 3815              | 5214              |                   | 72512              | 78482              | 5997                 | 8.2                 |

Source: Massachusetts Dept. of Employment and Training, Current Employment Statistical Survey 1980-89.

## **B. Sex**

According to the 1990 census, the region's population is divided approximately evenly between males and females. There is a slightly larger number of females overall, with this gender disparity most concentrated in the urbanized areas of Fitchburg, Gardner, Leominster, Clinton and Athol. The only town with a significantly higher proportion of males than females is Harvard, where the unusual 20-point percentage disparity is due to the predominantly male Fort Devens military base population housed there. However, the larger size of the region's female population was largely compensated for by a more rapid increase in the number of males in the population during the past decade. This trend brought all of the towns and cities with large gender differentials closer to balance by 1990.

## **C. Race**

In keeping with national trends, the Montachusett population is becoming more diverse in its racial and ethnic makeup. In 1980, whites constituted 96.3% of the population, declining to 93.5% by 1990 (see Table 5.4). By comparison, the state-wide percentage of whites was 89.8% in 1990, putting the percentage of minorities in the Montachusett Region below the state average. However, minority racial and ethnic groups represented one of the fastest growing population segments in the region, tripling from 3.8% to 11.4% of the total population during the 1980s.

While the white population grew by 7.4% during the 1980s, the black population grew 58.5% to 6,347 persons, and Asians increased by 241.1% to 3,179 persons. Hispanics number 11,067 persons within a 1990 total population of 223,865 persons. (1980 Census figures for Hispanics are not available for Montachusett towns.) Most minorities remain concentrated in the region's urban areas and their immediately surrounding towns.



According to the 1990 census, the median age for Hispanic persons in Leominster and Fitchburg, the region's largest cities, is approximately 21 years. This is more than a decade younger than the region's overall median age. This indicator points to the continuation of relatively rapid growth in the Hispanic population and to an ongoing increase in the region's racial/ethnic mix during the years ahead.

**Table 5.4: Population by Racial/Ethnic Group in Montachusett Communities: 1980 - 1990**

| Community             | 1990<br>Pop. | White  | %<br>White | Black | Any Race<br>Hispanic | Amer*<br>Indian | 1 Asian<br>Pac Isl. |
|-----------------------|--------------|--------|------------|-------|----------------------|-----------------|---------------------|
| Ashburnham            | 5433         | 5382   | 99.1       | 7     | 42                   | 7               | 24                  |
| Ashby                 | 2717         | 2703   | 99.5       | 6     | 27                   | 0               | 8                   |
| Athol                 | 11451        | 11218  | 98.0       | 58    | 102                  | 56              | 65                  |
| Ayer                  | 6871         | 5730   | 83.4       | 674   | 340                  | 39              | 217                 |
| Clinton               | 13222        | 12390  | 93.7       | 253   | 1032                 | 9               | 133                 |
| Fitchburg             | 41194        | 36847  | 89.4       | 1411  | 3957                 | 97              | 1057                |
| Gardner               | 20125        | 19201  | 95.4       | 403   | 558                  | 28              | 182                 |
| Groton                | 7511         | 7378   | 98.2       | 53    | 62                   | 15              | 58                  |
| Harvard               | 12329        | 10160  | 82.4       | 1507  | 673                  | 54              | 327                 |
| Hubbardston           | 2797         | 2778   | 99.3       | 8     | 27                   | 4               | 4                   |
| Lancaster             | 6661         | 5957   | 89.4       | 431   | 409                  | 20              | 77                  |
| Leominster            | 38145        | 35506  | 93.1       | 860   | 3161                 | 71              | 621                 |
| Lunenburg             | 9117         | 8962   | 98.3       | 60    | 88                   | 10              | 60                  |
| Petersham             | 1131         | 1105   | 97.7       | 7     | 2                    | 3               | 14                  |
| Phillipston           | 1485         | 1467   | 98.8       | 0     | 5                    | 4               | 11                  |
| Royalston             | 1147         | 1139   | 99.3       | 5     | 7                    | 0               | 3                   |
| Shirley               | 6118         | 5369   | 87.8       | 421   | 269                  | 20              | 183                 |
| Sterling              | 6481         | 6393   | 98.6       | 44    | 73                   | 18              | 21                  |
| Templeton             | 6438         | 6391   | 99.3       | 26    | 49                   | 3               | 13                  |
| Townsend              | 8496         | 8388   | 98.7       | 79    | 61                   | 4               | 18                  |
| Westminster           | 6191         | 6140   | 99.2       | 12    | 37                   | 11              | 19                  |
| Winchendon            | 8805         | 8679   | 98.6       | 22    | 86                   | 16              | 64                  |
| 1990 TOTAL:           | 223865       | 209283 | 93.5       | 6347  | 11067                | 489             | 3179                |
| 1980 TOTL:            | 202557       | 195114 | 96.3       | 4004  | NA                   | 281             | 932                 |
| % Change<br>1980-1990 | 10.5         | 7.3    |            | 58.5  |                      | 74.0            | 241.1               |

Source: U.S. Dept. of Commerce, Bureau of the Census 1990.

\* Includes Eskimos and Aleutians.

1 Includes Japanese, Chinese, Filipino, Korean, Asian Indian, Vietnamese, Hawaiian, Guamanian and other Asians.

## 5.2 Educational Levels

The percentage of Montachusett residents age 25 and over who had graduated from high school stood at 71.7% in 1980, slightly under the state average of 72.2% but above the national rate of 66.3%. The region's graduation rate improved by 10.6% over the next ten years to 82.2%. This rate significantly exceeds the nation's 1990 percentage of persons over 25 with high school degrees (75.2%) and slightly exceeds the state level of 80.0%.

All Montachusett communities experienced an improvement of at least 5% in their percentage of high school graduates during the 1980s, with the exception of Harvard which began and ended the decade with the region's highest percentages of high school graduates (1980 - 95%, 1990 - 97%). Among the communities with the most dramatic improvement in their percentage of high school graduates was Winchendon, which went from 58.5% in 1980 to 76.8% of the 1990 population over age 25 in possession of a high school degree. That is an improvement of 18% over the decade. The town of Athol also increased its percentage of high school graduates significantly from 60.5% in 1980 to 74.2% in 1990.

The larger urban population centers contain lower than average percentages of high school graduates, meaning larger absolute numbers of people in cities lacking high school degrees. Fitchburg and Leominster are the only two cities for which the 1990 census also collects data on the percentage of Hispanic high school graduates, with the data showing a significantly lower than average rate. In Fitchburg, only 40.6% of Hispanics over age 25 had high school degrees in 1990, as compared with 70.1% for the city overall. In Leominster, the corresponding rates are 44.1% for Hispanics and 75.9% for the city's total population. These rates are slightly below the national average for Hispanics.

Measuring higher education, by 1990, the percentage of Montachusett residents possessing a bachelors degree had increased to 22.7%. This level trails the comparable state-wide rate of 27.2% for persons age 25 and over in 1990, but exceeds the nation-wide rate of 20.3%.

Again, the town containing the highest percentage of four-year college graduates in 1990 was Harvard (41.5%). Towns containing the lowest percentages of four-year college graduates included Templeton (10.5%), Athol (12.1%), Clinton (13.1%), Winchendon (13.4%) and Fitchburg (13.5%). Percentages of Hispanic college graduates in Fitchburg (6.4%) and Leominster (7.6%) were again significantly lower than city-wide and regional rates. (Note: comparative data were not available for the towns of Ashby, Gardner, Hubbardston, Petersham, Phillipston, and Royalston.)



**Table 5.5: Education Status by Community in Montachusett:  
1980 - 1990**

| Community   | Persons 25+<br>% HS Grads<br>1980 | Persons 25+<br>% HS Grads<br>1990 | '80-'90<br>% Change | Persons 25+<br>% w/Bach.<br>1990 |
|-------------|-----------------------------------|-----------------------------------|---------------------|----------------------------------|
| Ashburnham  | 69.0                              | 83.1                              | 14.1                | 25.9                             |
| Ashby       |                                   | 87.9                              |                     | 19.7                             |
| Athol       | 60.5                              | 74.2                              | 13.7                | 12.1                             |
| Ayer        | 71.3                              | 81.6                              | 10.3                | 14.7                             |
| Clinton     | 65.5                              | 76.2                              | 10.7                | 13.1                             |
| Fitchburg   | 64.4                              | 70.1                              | 5.7                 | 13.5                             |
| Gardner     |                                   |                                   |                     |                                  |
| Groton      | 84.3                              | 89.2                              | 4.9                 | 41.5                             |
| Harvard     | 95.7                              | 97.0                              | 1.3                 | 47.0                             |
| Hubbardston |                                   | 87.1                              |                     | 21.1                             |
| Lancaster   | 76.1                              | 82.8                              | 6.7                 | 27.4                             |
| Leominster  | 64.4                              | 75.9                              | 11.5                | 19.1                             |
| Lunenburg   | 76.1                              | 84.4                              | 8.3                 | 27.6                             |
| Petersham   |                                   |                                   |                     |                                  |
| Phillipston |                                   |                                   |                     |                                  |
| Royalston   |                                   |                                   |                     |                                  |
| Shirley     | 70.0                              | 81.0                              | 11.0                | 19.5                             |
| Sterling    | 80.9                              | 88.4                              | 7.5                 | 32.6                             |
| Templeton   | 58.5                              | 70.8                              | 12.3                | 10.5                             |
| Townsend    | 80.4                              | 88.4                              | 8.0                 | 24.8                             |
| Westminster | 71.4                              | 85.4                              | 14.0                | 24.3                             |
| Winchendon  | 58.5                              | 76.8                              | 18.3                | 13.4                             |
| Region Avg. | 71.7                              | 82.2                              | 14.7                | 22.7                             |
| Mass. Avg.  | 72.2                              | 80.0                              | 10.8                | 27.2                             |

Source: U.S. Dept. of Commerce, Bureau of the Census 1990

### 5.3 Income Levels

#### A. Median family income

In 1989, median family income in the Montachusett region averaged \$43,577, slightly below the state-wide median family income of \$44,367 (see Table 5.6). The region's 1989 median family income represents a 174% increase from the 1979 regional level of \$15,700. The comparable state-wide median for 1979 was \$21,329. Comparison of the

state and regional median family incomes over the 1980s shows Montachusett making significant gains, ending the decade nearly even with the state median. The overall increase in income, however, masks significant variations within towns and cities in the region.

Within the region, the contrast between urban areas and wealthier small towns ranged from a high in median family income of \$60,000 in Groton, to a low of \$32,939 in Ayer. Fitchburg (\$33,357) and Athol (\$33,263) also showed relatively low median family income levels, although other urban centers such as Leominster (\$41,927) and Clinton (\$40,139) compared favorably with many of the suburban towns.

### **B. Per capita income levels**

In 1989, average per capita income for the Montachusett region was \$15,526 (see Table 5.6). This ranks the region above the national per capita income rate of \$13,546, but below the state-wide average of \$17,070. Within the region, per capita income in 1989 ranged from a high of \$22,832 in Groton to a low of \$12,140 in Fitchburg, the most populous community in the region. Again, Leominster (\$15,960) and Clinton (\$15,328) showed higher per capita income levels than other urban areas, indicating healthier local economies.

### **C. Poverty Levels**

The region's poverty level decreased during the 1980s, although not as significantly as the state-wide decline. In 1979, 8.3% of all Montachusett households had incomes below the federally determined poverty level. By 1989, the poverty level for the region as a whole had declined to 6.4%. State-wide, the poverty rate dropped from 9.8% in 1979 to 6.7% in 1989. Montachusett towns with the highest percentages of households below the poverty line in 1989 were the urban areas of Fitchburg (14%), Athol (11.7%) and Gardner (11.0%). In all three, poverty levels increased during the 1980s, in contrast to regional and



state trends. The urban areas of Leominster (7.2%) and Clinton (7.5%) showed lower percentages of households below the poverty line than other urban areas in the region. The town with the lowest poverty rate was Ashby (2.5%). In addition, 10 of the 22 towns in the region reported fewer than 5% of households below the poverty line.

**Table 5.6: Per Capita Income, Median Family Income and Poverty Level by Community in Montachusett: 1989**

| Community          | Per Capita<br>Income<br>1989 | Median<br>Household<br>1989 | Median<br>Family<br>1989 | Number<br><<br>Poverty<br>1989 | Percent<br><<br>Poverty<br>1989 |
|--------------------|------------------------------|-----------------------------|--------------------------|--------------------------------|---------------------------------|
| Ashburnham         | \$15,595.00                  | \$42,442.00                 | \$45,359.00              | 332                            | 6.2                             |
| Ashby              | \$16,611.00                  | \$46,250.00                 | \$49,310.00              | 68                             | 2.5                             |
| Athol              | \$12,444.00                  | \$27,094.00                 | \$33,263.00              | 1312                           | 11.7                            |
| Ayer               | \$14,586.00                  | \$29,326.00                 | \$32,939.00              | 596                            | 8.9                             |
| Clinton            | \$15,328.00                  | \$34,091.00                 | \$40,139.00              | 980                            | 7.5                             |
| Fitchburg          | \$12,140.00                  | \$27,101.00                 | \$33,357.00              | 5461                           | 14                              |
| Gardner            | \$13,207.00                  | \$28,035.00                 | \$35,430.00              | 2092                           | 11                              |
| Groton             | \$22,832.00                  | \$55,169.00                 | \$60,000.00              | 286                            | 3.8                             |
| Harvard            | \$17,937.00                  | \$47,299.00                 | \$47,481.00              | 373                            | 3.9                             |
| Hubbardston        | \$15,575.00                  | \$42,650.00                 | \$46,853.00              | 111                            | 4                               |
| Lancaster          | \$14,619.00                  | \$41,552.00                 | \$46,924.00              | 306                            | 5.5                             |
| Leominster         | \$15,960.00                  | \$35,974.00                 | \$41,927.00              | 2713                           | 7.2                             |
| Lunenburg          | \$19,166.00                  | \$43,199.00                 | \$49,625.00              | 322                            | 3.5                             |
| Petersham          | \$17,542.00                  | \$39,063.00                 | \$45,855.00              | 61                             | 5.8                             |
| Phillipston        | \$13,216.00                  | \$35,573.00                 | \$40,069.00              | 114                            | 7.7                             |
| Royalston          | \$12,421.00                  | \$33,333.00                 | \$36,923.00              | 72                             | 6.3                             |
| Shirley            | \$15,581.00                  | \$38,377.00                 | \$43,372.00              | 272                            | 4.8                             |
| Sterling           | \$17,830.00                  | \$49,345.00                 | \$53,339.00              | 299                            | 4.6                             |
| Templeton          | \$13,347.00                  | \$34,395.00                 | \$38,074.00              | 284                            | 4.6                             |
| Townsend           | \$15,694.00                  | \$46,910.00                 | \$50,629.00              | 256                            | 3                               |
| Westminster        | \$16,798.00                  | \$46,292.00                 | \$51,986.00              | 274                            | 4.4                             |
| Winchendon         | \$13,143.00                  | \$32,362.00                 | \$35,828.00              | 790                            | 9.1                             |
|                    |                              |                             |                          | 17374                          |                                 |
| Region 1989<br>avg | \$15,526.00                  | \$38,901.45                 | \$43,576.00              |                                | 7.7                             |
| Mass. 1989<br>MFI  |                              |                             | \$44,367.00              |                                |                                 |
| Mass. 1979<br>MFI  |                              |                             | \$21,329.00              |                                |                                 |

Sources: U.S. Department of Commerce, Bureau of the Census 1990.

## 5.4 Size of the labor force

According to census figures, the total size of the labor force in the Montachusett region measured in terms of persons sixteen years and older stood at 172,680 in 1990. The census measured the civilian labor force at 113,407.

In 1989, the Massachusetts Department of Employment and Training measured total employment in the region at 78,482 jobs (see Table 5.7). This represents a total net increase of 5,997 jobs over the 1980 employment level of 72,512 jobs, or an 8.2% rate of job growth over the decade. By comparison, the census data for the decade showed a corresponding growth rate in the state-wide civilian labor force of 7.8% during the 1980s.

**Table 5.7: Job Gain/Loss by Community in Montachusett: 1980 - 1989**

| Community   | 1980 #<br>Establ. | 1989 #<br>Establ. | % Gain<br>'80-'90 | 1980 Tot.<br>Empl. | 1989 Tot.<br>Empl. | # Jobs +-<br>'80-'90 | % Job +-<br>'80-'90 |
|-------------|-------------------|-------------------|-------------------|--------------------|--------------------|----------------------|---------------------|
| Ashburnham  | 61                | 88                | 44.3              | 723                | 735                | 12                   | 1.7                 |
| Ashby       | 33                | 63                | 90.9              | 129                | 243                | 114                  | 88.4                |
| Athol       | 209               | 269               | 28.7              | 4956               | 4012               | -944                 | -19.0               |
| Ayer        | 178               | 259               | 45.5              | 4714               | 6408               | 1694                 | 35.9                |
| Clinton     | 270               | 317               | 17.4              | 5315               | 4852               | -463                 | -8.7                |
| Fitchburg   | 906               | 1089              | 20.2              | 17469              | 18217              | 748                  | 4.3                 |
| Gardner     | 401               | 459               | 14.5              | 9886               | 8950               | -936                 | -9.5                |
| Groton      | 111               | 176               | 58.6              | 1485               | 1729               | 244                  | 16.4                |
| Harvard     | 75                | 135               | 80.0              | 628                | 962                | 334                  | 53.2                |
| Hubbardston | 27                | 58                | 114.8             | 213                | 514                | 301                  | 141.3               |
| Lancaster   | 88                | 120               | 36.4              | 1536               | 2297               | 761                  | 49.5                |
| Leominster  | 745               | 1090              | 46.3              | 14051              | 16505              | 2454                 | 17.5                |
| Lunenburg   | 109               | 177               | 62.4              | 1105               | 1769               | 664                  | 60.1                |
| Petersham   | 25                | 32                | 28.0              | 94                 | 137                | 43                   | 45.7                |
| Phillipston | 8                 | 15                | 87.5              | 71                 | 106                | 35                   | 49.3                |
| Royalston   | 7                 | 10                | 42.9              | 40                 | 52                 | 12                   | 30.0                |
| Shirley     | 62                | 97                | 56.5              | 1159               | 1100               | -59                  | -5.1                |
| Sterling    | 95                | 156               | 64.2              | 807                | 1132               | 325                  | 40.3                |
| Templeton   | 91                | 117               | 28.6              | 1298               | 1219               | -79                  | -6.1                |
| Townsend    | 82                | 151               | 84.1              | 2099               | 2943               | 844                  | 40.2                |
| Westminster | 71                | 133               | 87.3              | 2858               | 2831               | c                    | -0.9                |
| Winchendon  | 161               | 203               | 26.1              | 1876               | 1769               | -107                 | -5.7                |
| Totals:     | 3815              | 5214              |                   | 72512              | 78482              | 5997                 | 8.2                 |

Source: Massachusetts Dept. of Employment and Training, Current Employment Statistical Survey 1980-89.



Currently, 8 tenants occupy 50% of the building space in the Center. The current tenants have been in the complex for 1 to 20 years. They include Sullivan Transportation, which provides storage and warehousing; Avery Denison, which manufactures book binders and are listed on the New York Stock Exchange; and the U. S. Post Office, which operates a bulk mail transfer operation at this location and occasionally holds auctions. Several other tenants have expanded within the Center during their occupancy. But, about six years ago, the Massachusetts Division of Employment and Training (DET) moved out of the Center. An investment of approximately \$100,000 would be required to renovate the vacated premises. The return of DET to the Center would improve the complex's viability and the vitality of the area.

The marketing potential for the Center is very good compared to the other sites examined. The complex offers on-site parking and access to Routes 291, 91 and the Massachusetts Turnpike. The structures are in good condition, but do not comply with ADA regulations. Also, the presence of existing tenants is beneficial for security, safety and RESALE VALUE.

The Center is not presently for sale, but condominium ownership has been considered. Since the heating system is centralized, this creates additional considerations regarding any subdivided ownership of the Center. Additional tenants are currently being sought to occupy the available 50% of the space.

**Figure 7.**

### **Springfield Industrial Center Photographs**





## **8. Transtex Buildings**

### **8.1 Ownership History**

The Transtex Buildings were constructed in 1896 and additions were made in 1900 and 1920. It was originally used as a drop forge shop for the manufacture of machine tools by Baush Machine Tool Company. In 1966 the complex was purchased by the manufacturing company: Moore Drop Forging. In 1988, Wason Associates Inc. purchased the buildings followed by a tax taking in 1989 by the City of Springfield. Wason Associates regained ownership in 1993 and are the current property owners.

### **8.2 Context**

The Transtex Buildings are located at 156 Wason Avenue in the northwest corner of Brightwood district of Springfield. The property is 1 mile from Route 91 and 1.25 miles from Route 291. It is also served by PVT route 105 which connects the northern residential area along the Connecticut River to the southeast corner of Forest Park in Longmeadow. This route passes the Peter Pan bus terminal and Amtrak stations, Symphony Hall, the Civic Center and the Basketball Hall of Fame. It has no documented past or current DEP environmental violations and it is not a historic structure.

The Brightwood district is zoned 50% residential, 40% business, and 10% industrial. The buildings and the adjacent properties to the north and south are zoned Industrial A. Areas to the west are zoned Industrial A, Residential B, and Residential C, while areas to the east are zoned Residential A. As a result of this zoning, there are no adjacent business services available.

The three primary employers in the district are manufacturers, professional services, and wholesale and retail trade. The community facilities include an elementary and secondary school and a public library. Approximately 18% of the district's acreage are parks and open space which include Marina Park, a boat launch, and Kenefick Park (12 acres).

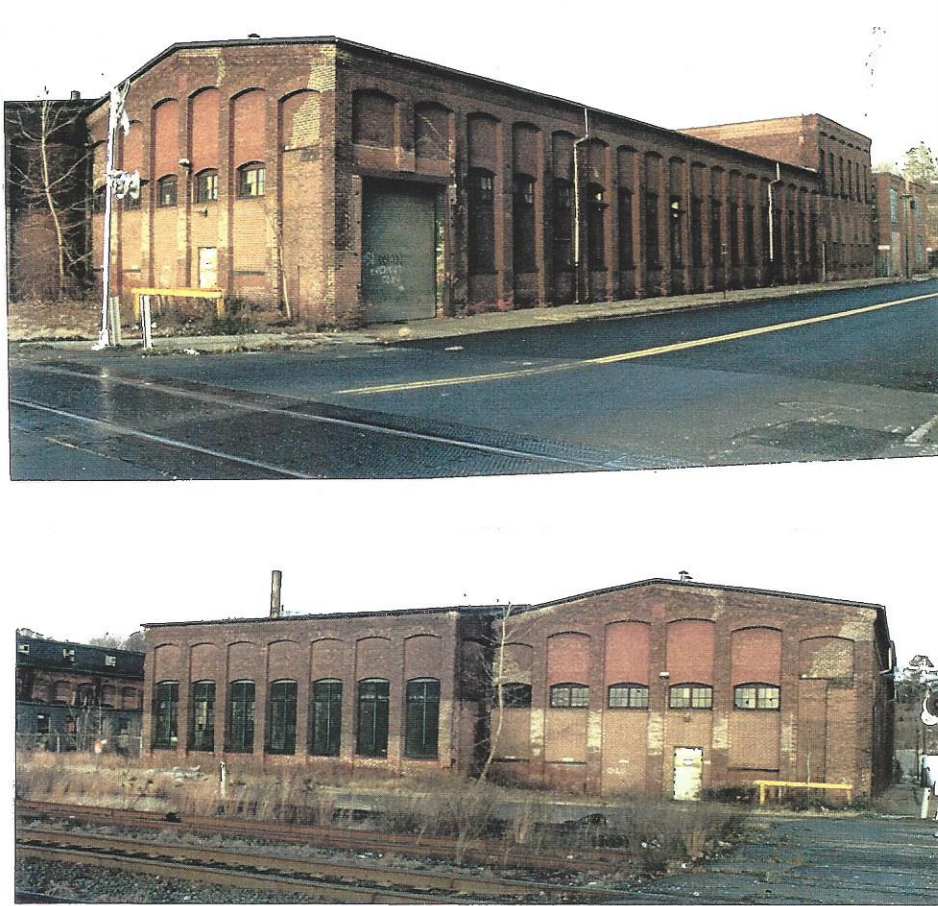
### **8.3 Site and Building Information**

The Transtex complex occupies a land mass of 142,441 square feet and the buildings have an area of 91,687 square feet. The complex consists of three buildings; building one has nine sections which range between one and two stories, building two is a smaller one-story building and building three is a two-story building with two sections.

The complex is located at street level and has a frontage of 325.66 linear feet. The street is paved and has curbs, gutters and a sidewalk. The building has a wood joist construction type and an exterior wall of brick (see Figure 8).

The complex is heated by hot water and steam and has a wet sprinkler system throughout. There are loading dock facilities and electric freight elevators in the complex. The physical condition of the buildings is normal as is the functional utility. The complex is connected to all public utilities and adequate parking is available on site. There was no evidence of vandalism.

**Figure 8.**  
**Transtex Buildings Photographs**



#### **8.4 Occupancy and Marketing Potential**

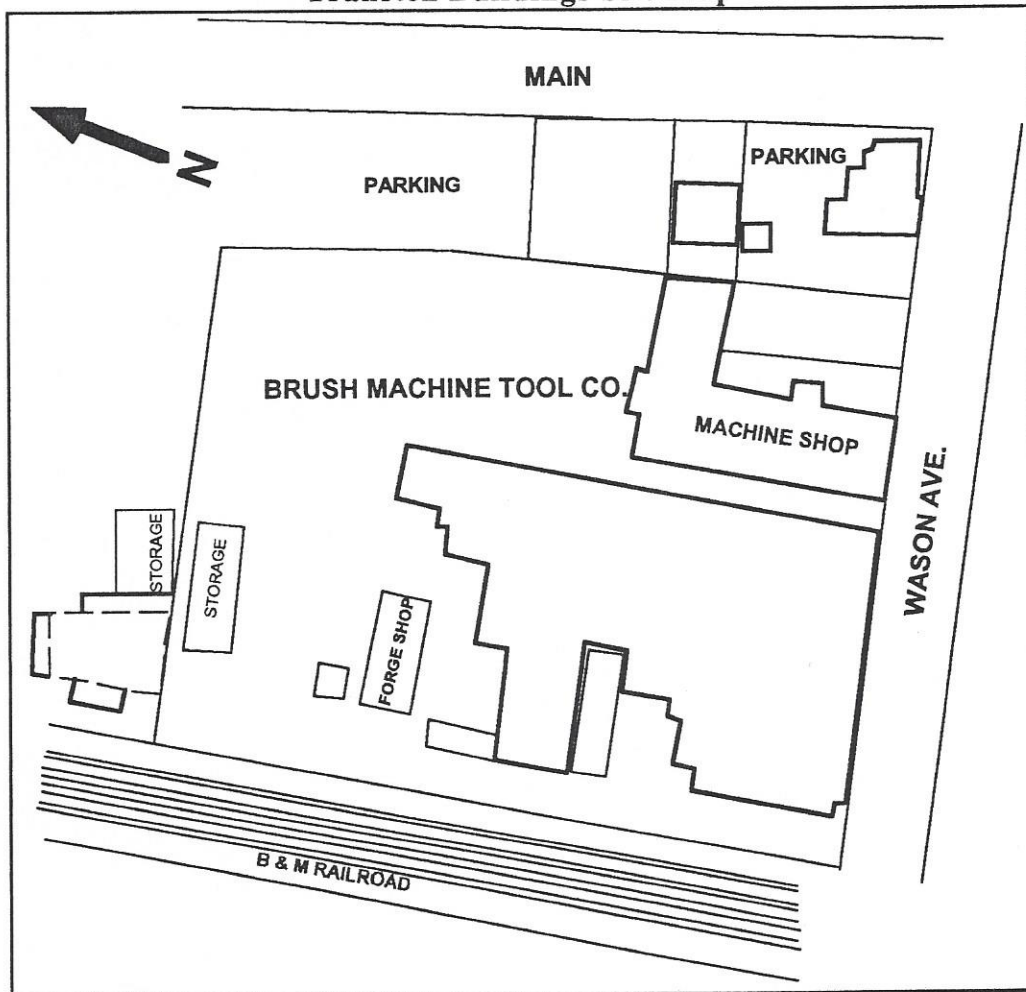
The Transtex Buildings are currently vacant. The expected rent to be charged would range between \$1.00 to \$2.00 per square foot; management would provide a build-out for a tenant and ordinary building maintenance. Although the owners would be willing to subdivide the space as permitted by zoning regulations, their broker commented that the building is best suited for a single tenant as it is primarily a two-story structure with over 45,000 square feet per floor. The buildings are on the market for \$850,000 and the owners would prefer to sell the property as opposed to rent.

Its marketing potential is good compared to the other sites involved in this study. It is located in an area of urban renewal, close to the Bay State Medical Center, which is expanding and becoming an office park. It has adequate on-site parking and access to Routes 91, 291 and the Massachusetts Turnpike. The structure is in usable condition, but does not comply with ADA regulations.



Figure 8.1

Transtex Buildings Site Map



## **9. Van Norman Buildings**

### **9.1 Ownership History**

The Van Norman Buildings were owned and built by the Van Norman Machine Tool Company. This business employed over five hundred people to manufacture grinding and milling machines, lathes and machine tools. The buildings were subsequently owned by the Milton Bradley Company. However, the structures have been vacant for over ten years.

### **9.2 Context**

The Van Norman Buildings are located at 160 Wilbraham Avenue in the Upper Hill district, which is in the center of Springfield, to the east of the downtown area. The property is slightly over 2 miles from Rt. 91 and 2 1/4 miles from Rt. 291. It is served by PVT routes 103, 401, and 403. These routes connect downtown Springfield (Symphony Hall, Civic Center, Springfield Library), three local schools (Springfield Technical Community College, American International College, Western New England College), and the center of Wilbraham. It has no documented past or current DEP environmental violations and it is not a historic structure. The property, however, is located one block from a National Historic Register District.

The district is zoned for industrial, business and residential uses. The buildings and adjacent areas to the north and south are zoned Industrial A, which includes the Massachusetts Career Institute, a skill development center. The properties to the east and west are zoned Residential B and the property to the south is zoned Business B.

### **9.3 Site and Building Information**

No assessors files were available for the Van Norman buildings. The information presented here was provided by the broker and an inspection of the site.

The complex occupies a land mass of 2 acres and the buildings occupy 52,000 square feet. The topography of the site is level and the street is paved with gutters, curbs and a sidewalk. The buildings have a wood joist construction type with brick wall material and has loading dock facilities, which are in need of rehabilitation (see Figure 9). The complex has some on site parking. There is evidence that the buildings have been vandalized because there are broken windows and graffiti.

In the past, the complex was heated with steam unit heaters. However, the heating system is no longer operable. The complex was also equipped at one time with elevators and a sprinkler system, but these are also no longer operable. Presently, the buildings are connected to the public utilities, although a new line is needed from the street gas line to the complex and a transformer is needed to bring the electric power availability up to standard.

### **9.4 Occupancy and Marketing Potential**

The Van Norman Buildings have been vacant for over 10 years. It is expected that the buildings will be not be sold or leased within the next 12 to 18 months.

The marketing potential for the Van Norman buildings is poor compared to the other mill sites examined in this study. The property is located in an area, Mason Square, that has been studied as a urban renewal area. It is located one block from Wilbraham Road, which is a major thoroughfare and connects downtown Springfield with three educational institutions and Wilbraham center. Mixed business services are nearby as are educational institutions and residential areas. Since, most of the windows have been broken, the interior of the buildings have been vandalized and all fixtures, wiring, and plumbing has been removed, a substantial investment would be required to accommodate any use or tenants.

**Figure 9.**

**Van Norman Buildings Photographs**





## **10. Watershops**

### **10.1 Ownership History**

The Watershops complex was built in 1880 to house a satellite of the US Armory which was Springfield's first industry of far reaching importance. The buildings have changed ownership frequently but are currently owned by Henry DeLeo and Carlo Rovelli, who purchased the complex in 1980 and who are presently renting space to a number of small businesses.

### **10.2 Context**

The Watershops are located at 1 Allen Street in the Six Corners district on the western point of Watershop Pond in the center of Springfield. The property is 1.25 miles from Rt. 91 and 3 miles from Rt. 291. It is served by PVT routes 103 and 108. Route 103 connects the Liberty Heights district to downtown Springfield (Symphony Hall, Civic Center, Springfield Library) and to Chicopee Falls. Route 108 is a local Springfield line, which serves Orange, Plumtree, Walnut, and College Streets. It has no documented past or current DEP environmental violations. The property is eligible for historic status, but no application has yet been filed.

The Six Corners district is zoned for industrial, business and residential uses. The property is zoned Industrial A. Adjacent properties to the north are zoned Industrial A, Residential C and Residential B. Properties to the east are zoned Business A and Residential C. Finally, properties to the south are zoned Residential B, while property to the west is zoned Business B and Business A.

### **10.3 Site and Building Information**

The Watershops occupy a land mass of 4.617 acres, which is made up of four interconnecting buildings and two additional buildings occupying a total of 207,180 square feet. Most of the complex is two stories, but some of the buildings have attics and basements (see Figure 10).

**Figure 10.**

**Watershops Photographs**



The complex is situated below the level of the street, which is paved and has gutters, curbs and sidewalks. The buildings' construction type is wood joist and the external wall material is brick and stone. The complex is heated with unit heaters, but is not equipped with a sprinkler system. Loading dock facilities are equipped with wood and metal overhead doors and the buildings are serviced by all the public utilities. There are adequate parking facilities available on the site and off the street. There was no evidence of vandalism to the buildings.

#### **10.4 Occupancy and Marketing Potential**

The Watershops are partially occupied. Estimated sales price or leasing information was not available.

Its marketing potential is fair in comparison to other sites studied. The property has on-site parking, access to Routes 91 and 291 and functional structural condition. The buildings are sighted along Watershop Pond and Mill River, which connects westward to the Connecticut River. The adjacent land uses are very mixed. There are supporting business services nearby and the property is separated from the residential areas by 2-lane roads.



## **11. Wireland**

### **11.1 Historical Significance**

Cheney Bigelow bought the former Warwick Cycle Manufacturing Co. factory (building 1) in 1889. In the early 1900s, Cheney Bigelow consolidated its operations at the Warwick Street site and is responsible for the construction of the two other buildings. The industrial complex is significant for its associations with Cheney Bigelow Wire Works, which was a prominent local manufacturer of heavy iron wire work and related products for approximately a century (the complex is known as the Wireland Building). The building is currently being assessed for eligibility for inclusion in the National Historic Register.

The Cheney Bigelow complex consists of three interconnected brick buildings on the south side of Warwick Street. Building two is the most architecturally distinctive of the three buildings. The gabled two and a half story building has a three-bay center-entry facade on Heywood; tapered, castled piers on the facade; brick piers with stone weathering; segmental-arched windows and a fanlight and date plaque in the gable end.

The complex was occupied by the Cheney Bigelow Co. until 1974, when it was bought by Everflex Products, Inc. In 1985, the property and buildings were purchased by Louis Morin, its present owner. The building is partially occupied at present by a food distributor and a company which manufactures chairs.

### **11.2 Context**

The Wireland buildings are located at 35 Heywood Street in the Liberty Heights district, which is southeast of downtown Springfield. The property is less than 1/4 mile from Rt. 291 and 1.5 miles from Rt. 91. It is served by PVRTA route 103, which connects the Liberty Heights district to downtown Springfield (Symphony Hall, Civic Center, Springfield Library) and to Chicopee Falls. It has no documented past or current DEP environmental violations.

The Liberty Heights district is zoned for industrial, business and residential uses. The property itself and adjacent properties to the east and south are zoned Industrial A. Areas further east are zoned Business B and Residential C. The property to the south is the active Boston & Albany railroad lines and Sprint operates a bunker south of these lines on property that is zoned Business B. Properties to the north are zoned Residential B and properties to the west are zoned Residential C.

### **11.3 Site and Building Information**

The complex occupies a land mass of 61,333 square feet and is consistent with other industrial complexes constructed between Liberty Street and the railroad tracks in the late 19th and early 20th centuries. The complex consists of three interconnecting brick buildings, which occupy 46,028 square feet. Building one is a three story building; building two is two and a half stories; and building three has one and a half stories.

All of the buildings are located on the street line and the frontage of the complex is 148.4 feet with level topography. The street is paved and has curbs, gutters and a sidewalk (see Figure 11). The construction type of the buildings is wood joist and the wall material is brick with some concrete.



The majority of improvements to the complex, such as the installation of a sprinkler system and a heating system, were carried out in the 1940s.

**Figure 11.**

### **Wireland Photographs**



The complex is heated by unit heaters and hot air and has a wet sprinkler system throughout. There is an air conditioning system in the central part of the complex. It has wood and metal overhead doors and electric freight elevators. The buildings are serviced by the public utilities: water, sewer, electric and gas.

The complex had adequate parking facilities available in proximity to the site and off the street. There was no evidence of any vandalism to the buildings.

#### **11.4 Occupancy and Marketing Potential**

The Wireland buildings are currently vacant. Estimated sales price and leasing information were not available. Its marketing potential is poor as compared to the other mill sites examined in this study. Although the property has on-site parking, access to Routes 291 and 91 and fair external structural condition, a substantial investment would be required to accommodate any use or tenant.

The adjacent land uses are primarily residential, which may not be compatible with certain industrial activities. The south facade of the larger building is windowless, which provides a noise buffer to the active railroad, but may limit potential reuse options of the property. In addition, certain sections of the Liberty Heights district are considered unsafe.

## 12. Conclusion

Springfield is a city with the present day challenge of achieving economic development in the face of a decline in traditional industries. The city has many active and vacant mill buildings which should be utilized in future economic development strategies. However, finding appropriate reuse functions for mill buildings is difficult when environmental and economic efficiency factors are taken into consideration.

Successful reuse of existing mill buildings can only be achieved when the type of activity fills a particular community or market demand. In some cases, incubator units have proved to be a successful reuse of mills, in others, commercial or business services have provided a much needed activity within a community.

To a large extent the success of any type of reuse will depend upon the marketability of the particular location and the condition of the existing buildings. The needs of today's industries are vastly different to the past.. Most manufacturers require single-story facilities, which are easily accessible and have adequate infrastructure. The traditional mill building is characterized by several floors which makes then unsuitable for state-of-the-art manufacturing. The implications for the reuse of mills in Springfield is that a mixed use plan for reuse is needed. A mixed use plan could include manufacturing, commercial, residential, and office uses. To accommodate this mixed use scenario current zoning should be revised in the districts.

Development has increasingly been found in rural areas where an abundance of open spaces could be found. These open spaces have decreased and communities have realized that if development continues in these areas that soon there would be no rural or open land. Farmlands have been carved up, open space is threatened and landscapes are being changed dramatically. As a result, towns have begun to select more carefully the type and amount of development which occurs in their communities. Although this creates a serious dilemma for towns which need both development, and, wish to preserve their rural character, it provides an opportunity for cities which have existing sites suitable for reuse.

Springfield can use this opportunity if developers can be persuaded that mills provide a viable alternative to other locations. The success of any reuse depends on the match between the existing mill; the surrounding neighborhood, including complimentary facilities; and the type of industry or activity designated for reuse of the mill. This study has shown that as there is no single standard of mill building, structural condition, or context. Therefore, an across the board revitalization strategy is inappropriate. There can be no single prescription as to the best reuse of mills, but rather a range of possibilities must be considered and the most appropriate for that particular situation should be selected.

This study provided an initial analysis of ten mill buildings in the Springfield area. Further studies should be undertaken to determine the best reuse opportunities for these buildings. This could include a feasibility study of potential reuses, site development assessments, and an analysis of owners and public opinion on reuse of the mills.



## Bibliography

- Center for Economic Development. Reuse and Feasibility Study for the Waverly Mill Complex, Adams Massachusetts. Technical Report. University of Massachusetts, Spring 1991.
- Horner, Edith R., ED. Massachusetts Municipal Profiles 1993. Palo Alto : Information Publishers, 1993.
- Means Building and Construction Cost Data, 1993. R'S Means Co. Inc. : Kingston, MA
- Massachusetts Department of Environmental Protection Public Records. Springfield MA. 1993
- Massachusetts Government Land Bank and Mount Auburn Associates. Small Business Incubators : From Plan to Reality. The Massachusetts Government Land Bank, 1988.
- National Trust for Historic Preservation. The Mill Works Handbook. Washington D.C. : National Trust for Historic Preservation, 1983.
- Springfield Planning Department, The Neighborhood Profile, March 1988
- U.S. Census. Springfield and its Neighborhoods with selected population, Housing, Economic and Social Data Springfield Planning Department. 1993
- U.S. Department of Commerce. 1990 Census of Population : General Population Characteristics, Massachusetts. Washington, D.C. : Bureau of the Census, 1990.
- U.S. Department of Labor. Labor Statistics. Boston : Bureau of Labor Statistics, 1994.



**Appendix 1.**  
**Summary of Zoning Ordinance District Standards**

## Summary of Zoning Ordinance District Standards

| District Designation | Uses  |
|----------------------|---|
| Residential A-1      | Single-family   |
| Residential A        | Single-family   |
| Residential B        | Single-family detached, semi-detached, and two-family   |
| Residential C        | Single-family detached, attached or semi-detached two-family and multi-family                         |
| Residential C-1      | Residential Project two-family and garden apartments  |
| Residential C-2      | Multi-story apartment structure and accessory uses  |
| Residence Office     | Single & two-family; office building; day care center; nursery school. Funeral home by special permit |
| Commercial P         | Parking lot   |
| Commercial A         | Establishments serving day-to-day needs of immediate neighborhood                                     |
| Business A           | Major outlying business concentrations residential uses   |
| Business B           | Highway oriented & heavier service type businesses  |
| Business C           | Retail, office, amusement, hotel & apartment uses in downtown location                                |
| Industrial Park      | Light industrial research & office uses   |
| Industrial A         | Any no-obnoxious or industrial or business use  |
| Riverfront District  | Marina, recreation, apartments, along Connecticut River   |

**Appendix 2.**  
**Estimated Demolition Costs**



## Estimated Demolition Costs

| Building               |                       |          | cubic ft.   | @cost/ft <sup>3</sup> | = demolition  |
|------------------------|-----------------------|----------|-------------|-----------------------|---------------|
| A&P                    | $\frac{152,685}{3}$   | * 40 =   | 2,035,800   | .28                   | = \$570,000   |
| Crane                  | $\frac{456,084}{2.5}$ | * 25 =   | 1,824,336   | .21                   | = \$958,000   |
| Firestone              | $\frac{64,200}{4}$    | * 40 =   | 642,000     | .21                   | = \$134,820   |
| +                      | $\frac{2,904}{1}$     | * 10 =   | 29,040      | .21                   | = \$ 6098     |
|                        |                       |          |             |                       | \$ 140,900    |
| Gemini                 | $\frac{72,398}{3}$    | * 36 =   | 868,776     | .21                   | = \$182,500   |
| I.O                    | $\frac{262,424}{5}$   | * 50 =   | 2,624,240   | .21                   | = \$551,000   |
| Springfield Industrial | $\frac{1,200,000}{2}$ | * 24 =   | 144,000,000 | .28                   | = \$4,032,000 |
| Transtex               | $\frac{91,687}{2}$    | * 24 =   | 1,100,244   | .21                   | = \$232,000   |
| Van Norman             | $\frac{52,000}{2.5}$  | * 25 =   | 520,000     | .21                   | = \$109,200   |
| Watershops             | $\frac{207,180}{2.2}$ | * 26.4 = | 2,486,160   | .21                   | = \$522,100   |
| Wireland               | $\frac{46,028}{2.3}$  | * 23 =   | 460,280     | .28                   | = \$128,900   |

Equation : Total square feet / number of stories \* building height = cubic feet

Source : Means Building and Construction Cost Data, 1993.