DELAWARE VALLEY DATA
DELAWARE VALLEY REGIONAL PLANNING COMMISSION
ANALYTICAL DATA REPORT

**Analyzing the Region's Manufacturing Base**

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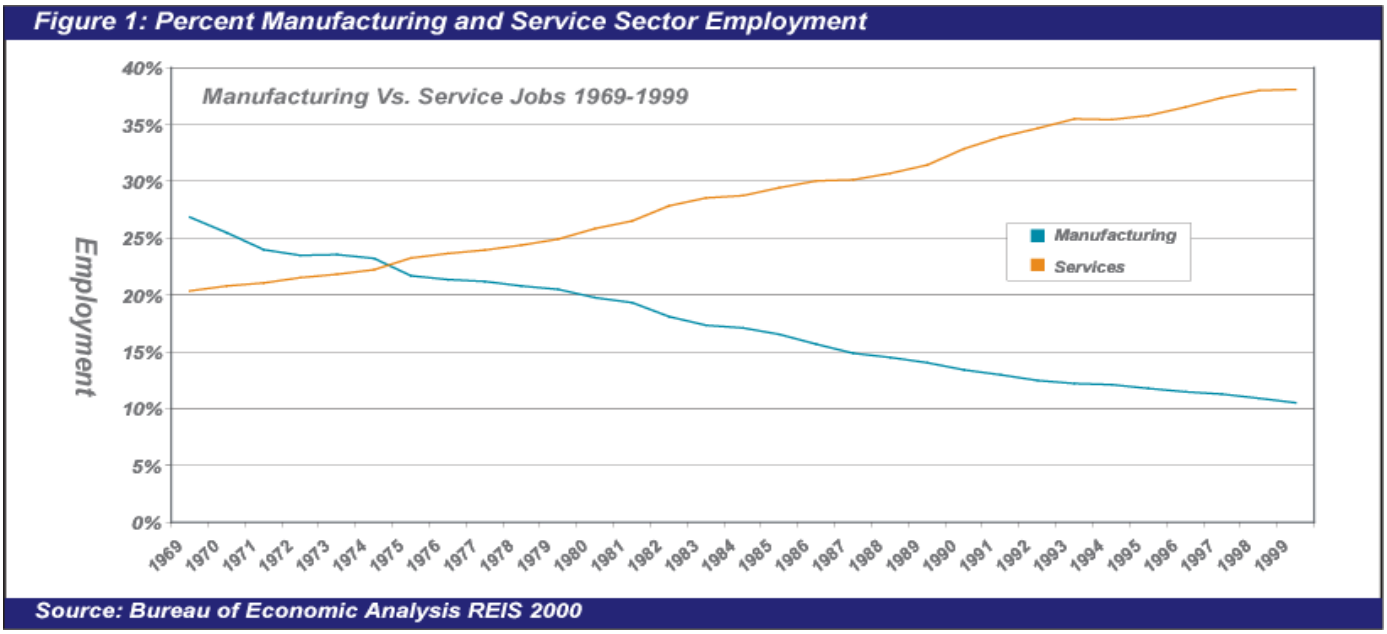
The Delaware Valley Regional Planning Commission (DVRPC) is an interstate, intercounty and intercity agency serving the Philadelphia-Camden-Trenton metropolitan area. As the region's metropolitan planning organization (MPO), the Commission provides technical assistance and services to its member state and local governments, the private sector and the public. *Delaware Valley Data* is our periodic series of free data bulletins and analytical data reports. This analytical report describes manufacturing job growth and decline in the Delaware Valley.

## Manufacturing: Down But Not Out

With the shells of former factories spreading up the Delaware River from Chester to Camden to Trenton, few would dispute that the zenith of our region's manufacturing economy has passed. As the Delaware Valley Regional Planning Commission (DVPRC) has documented in previous reports, manufacturing has been in decline for several decades. In 1970, 1 in 4 jobs in the region were in manufacturing, while by 2000 the ratio had dropped to only 1 in 10. Simultaneously, while manufacturing declined in post-war Philadelphia, the percentage of the workforce involved in services has steadily increased. Figure 1 graphically displays this change.

*Figure 1: Percent Manufacturing and Service Sector Employment*

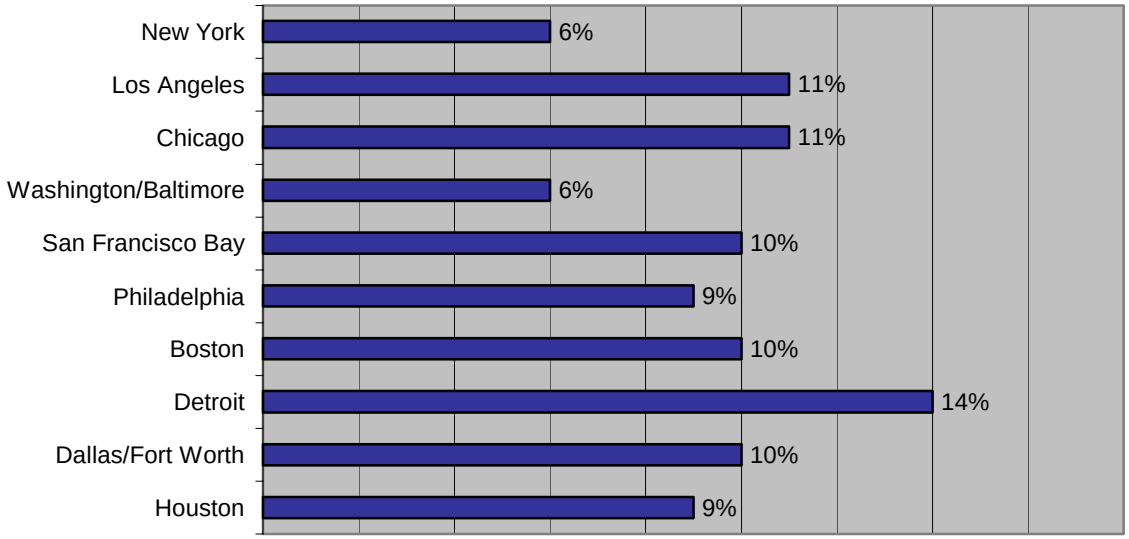



*Source: Bureau of Economic Analysis REIS 2000*

While the drop in Delaware Valley manufacturing employment may look alarming, this change is not strictly local. Most major US regions have roughly 10% of their labor force employed in the manufacturing sector. Figure 2 represents the level of manufacturing employment to total employment in the nation's top ten

metropolitan areas as of 2001. Regions are ranked by population. There are a few notable exceptions to the 1 in 10 rule; Detroit, for example, is above average in manufacturing employment, while New York and Washington are below. Philadelphia's manufacturing base, however, does not appear to be unusual.

**Figure 2: Percent of Metropolitan Area Employment in Manufacturing**




**Source: Delaware Valley Regional Planning Commission, October 2003.**

In light of these trends, economic development officials have sought service-based or new technology jobs, but the question must be asked: has manufacturing become irrelevant? At the dawn of this century, our region still has nearly 250,000 manufacturing jobs. It would be a mistake to miss the critical role of these jobs to our economy. Manufacturing may be down, but it's not out. Using the same location quotient methodology as the DVRPC's analysis of the service sector (Analytical Report # 10, *Job Growth and Decline in the Delaware Valley*), and dividing the manufacturing sector into its sub-components via NAICS codes provided by the Census Bureau, Figure 3 testifies to the variety of manufacturing strengths in the Delaware Valley.

## From "Job Supplier" to "Job Supporter"

For many years, manufacturing was the economic engine of the Delaware Valley. The factories of our historic region supplied the nation with its goods and the region with its jobs. Times have changed. In the 21st Century, not only have the labor-intensive manufacturing jobs such as textiles gone abroad, but so have the heavy industrial and value-added jobs such as automobile parts.

While the remnants of these industries are visible—we still employ 5000 in textiles and 10,000 in motor vehicle parts—the region is no longer a major player in these fields. Despite losing this role as a supplier of the nation's goods and of our region's job base, the manufacturing sector has an important role. Modern manufacturing may no longer be the economic engine of the Delaware Valley, but in many ways it supports the other engines of our economic development.

It is more than just supplemental to our flourishing service sector; manufacturing often buttresses services by supplying that sector with important components. Another interpretation of manufacturing vitality is that it's an equal contributor to a number of interlocking, mutually contributing industries spanning across the sectors that fortify the region. Digging deeper into NAICS classifications reveals these intriguing characteristics of the manufacturing sector's relationship with the rest of the economy.

| Figure 3: Manufacturing Location Quotients by 3-digit NAICS Codes | | | | | |
|---|---|---|---|---|---|
| **NAICS** | **Job Description** | **Jobs** | **Location Quotient** | **% all Manufact. Jobs** | **Rank** |
| **31 Total** | **Food, Beverage, & Textiles** | **42,026** | | **17%** | |
| ***311*** | ***Food manufacturing*** | ***23,115*** | ***1.05*** | ***9.2%*** | ***4*** |
| 312 | Beverage & tobacco product manufacturing | 2,314 | - | 1% | |
| 313 | Textile mills | 3,218 | - | 1% | |
| 314 | Textile product mills | 2,030 | - | 1% | |
| 315 | Apparel manufacturing | 11,080 | 1.03 | 4% | |
| 316 | Leather & allied product manufacturing | 269 | - | 0% | |
| **NAICS** | **Job Description** | **Jobs** | **Location Quotient** | **% Jobs** | **Rank** |
| **32 Total** | **Wood, Petroleum, & Chemicals** | **79,559** | | **32%** | |
| 321 | Wood product manufacturing | 2,080 | - | 1% | |
| 322 | Paper manufacturing | 11,236 | 1.31 | 4% | |
| ***323*** | ***Printing & related support activities*** | ***23,739*** | ***1.90*** | ***9.4%*** | ***3*** |
| 324 | Petroleum & coal products manufacturing | 4,707 | 2.93 | 2% | |
| ***325*** | ***Chemical manufacturing*** | ***21,387*** | ***1.62*** | ***8.5%*** | ***5*** |
| 326 | Plastics & rubber products manufacturing | 11,455 | - | 5% | |
| 327 | Nonmetallic mineral product manufacturing | 4,955 | - | 2% | |
| **NAICS** | **Job Description** | **Jobs** | **Location Quotient** | **% Jobs** | **Rank** |
| **33 Total** | **Metal & Machines** | **130,323** | | **52%** | |
| 331 | Primary metal manufacturing | 9,586 | 1.05 | 4% | |
| ***332*** | ***Fabricated metal product manufacturing*** | ***28,785*** | ***1.09*** | ***11.4%*** | ***1*** |
| 333 | Machinery manufacturing | 18,207 | - | 7% | |
| ***334*** | ***Computer & electronic product manufacturing*** | ***27,385*** | ***1.08*** | ***10.9%*** | ***2*** |
| 335 | Electrical equipment, appliance, & component mfg | 7,227 | - | 3% | |
| 336 | Transportation equipment manufacturing | 18,157 | - | 7% | |
| 337 | Furniture & related product manufacturing | 7,671 | - | 3% | |
| 339 | Miscellaneous (Including Medical) manufacturing | 13,305 | 1.21 | 5% | |
| **31-33** | **Manufacturing Sector** | **251,908** | | **10%** | |

**Source: Delaware Valley Regional Planning Commission, October 2003.**

Analyzing NAICS at four or greater digits, three stories of manufacturing in the Delaware Valley emerge: the tale of manufacturing's relationship with the ***Knowledge Economy,*** the tale of manufacturing's nourishment of the ***Sprawl Economy*** and the tale of manufacturing's contribution to our critical ***Economic Diversity***.

## The Knowledge Economy

In previous reports we have introduced the concepts of clusters and synergies, clusters being concentrations within a sector and synergies the connections between them. Manufacturing in the Delaware Valley is definitely forming clusters and synergies, the most important being the synergy with the service sector and its high-end *Knowledge Economy*. In recent decades the Knowledge Economy has become the region's economic engine. To examine the connections between manufacturing and the Knowledge Economy, Figures 4 and 5 highlight manufacturing sub-sectors at the four-digit level of NAICS codes. Figure 4 concentrates on manufacturing jobs in NAICS 32 (wood, petroleum and chemical products) and Figure 5 examines NAICS 33 (metals, machinery, electronics). For readability, codes of greater than four digits are in brackets.

| FIGURE 4: Manufacturing Jobs in NAICS 32 | | | | |
|---|---|---|---|---|
| NAICS | Category | Jobs | L.Q. Above 1 | Synergy |
| 321 | Wood product manufacturing | 2080 | - | |
| 322 | Paper manufacturing | 11236 | 1.31 | |
| 3222 | Converted paper product manufacturing | 9347 | 1.66 | Service Sector Synergy |
| 323 | Printing & related support activities | 23739 | 1.90 | |
| [32311] | [Printing] | [20063] | [1.78] | Service Sector Synergy |
| [32312] | [Support Activities for Printing] | [3676] | [13.85] | Service Sector Synergy |
| 324 | Petroleum & coal products manufacturing | 4707 | 2.93 | |
| [32411] | [Petroleum Refineries] | [3354] | [3.43] | Industrial Synergy |
| [32412] | [Asphalt paving, roofing, manufacturing] | [375] | [1.88] | |
| 325 | Chemical manufacturing | 21387 | 1.62 | |
| 3251 | Basic chemical manufacturing | 4265 | 1.41 | Industrial Synergy |
| [32512] | [Industrial Gas] | ['2210] | [11.86] | Industrial Synergy |
| 3252 | Resin, rubber, & artificial fibers & filaments mfg | 3183 | 1.86 | Industrial Synergy |
| 3254 | Pharmaceutical & medicine manufacturing | 8961 | 2.96 | Life Science Synergy |
| [325412] | [Pharmaceutical Preparation mfg] | [7553] | [4.38] | Life Science Synergy |
| [325414] | [Biological Product manufacturing] | [592] | [1.70] | Life Science Synergy |
| 3255 | Paint, coating, & adhesive manufacturing | 1841 | 1.64 | |
| 326 | Plastics & rubber products manufacturing | 11455 | - | |
| 3261 | Plastics product manufacturing | 10393 | - | Industrial Synergy |
| 327 | Nonmetallic mineral product manufacturing | 4955 | - | |

**Source: Delaware Valley Regional Planning Commission, October 2003.**

Since there are numerous categories of manufacturing, this list is not comprehensive. Both figures 4 and 5 display only manufacturing sub sectors in which we either have a high location quotient and/or a high job base. The color codes in the synergy column represent the "story" to which that NAICS code belongs. Yellow shaded synergies represent some type of connection with the Knowledge Economy.

Three aspects of the synergy between the service sector and manufacturing sector emerge in Figure 4 of NAICS code 32. The first is the connection between paper and printing and the overall service economy. Since most service jobs, especially the high end jobs of NAICS 54 of professional, technical and scientific services, are 'white collar', it is expected that paper supports printing which in turn supports the document generating offices of knowledge workers across the region. Presumably, since our printing sector has a location quotient above 1, we are not only supporting the robust service sector at home but also in regions adjacent to us.

The second Knowledge Economy synergy in NAICS 32 relates to our strengths in engineering. In DVRPC's Analytical Report # 10 (on the service sector), NAICS 5413 was one of our leading services. With nearly 35,000 jobs in engineering—representing more jobs than in any other sub-category of services or manufacturing—NAICS 5413 is clearly an important job supplier for the region. In report #10, we demonstrated how this important expertise forms a synergy with such service sector specialties as industrial design. The most obvious synergy, however, is with the region's remaining manufacturing jobs. Most of our industrial base has the potential to form a synergy with engineering services (NAICS 5413). "Professional and technical services" in engineering is nurturing a synergy with our petroleum, chemical, and plastics industries under NAICS 32.

The last synergy visible in Figure 4 of NAICS code 32 is with our region's renowned success in the pharmaceutical industry. While dissecting the service sector we were given only a hint of our region's preeminence in pharmaceuticals. A review of NAICS 32 makes it clear, revealing nearly 9,000 manufacturing jobs in pharmaceutical preparation and biological product manufacturing. As a testament to its strength within

| FIGURE 5: Manufacturing Jobs in NAICS 33 | | | | |
|---|---|---|---|---|
| NAICS | Category | Jobs | L.Q. Above 1 | Synergy |
| **331** | **Primary metal manufacturing** | **9586** | **1.05** | |
| 3311 | Iron & steel mills & ferroalloy manufacturing | 3,815 | 1.70 | Industrial Synergy |
| 3312 | Steel product mfg from purchased steel | 1,287 | 1.32 | |
| [33121] | [Iron & steel pipes and tubes] | [744] | [1.80] | |
| 3313 | Alumina & aluminum | 1,296 | 1.02 | |
| 3314 | Nonferrous metal (except aluminum) | 1,271 | 1.02 | |
| **332** | **Fabricated metal product manufacturing** | **28,785** | **1.09** | |
| [332114] | [Custom roll forming] | [315] | [1.39] | |
| 3323 | Architectural & structural metals manufacturing | 6,048 | 1.06 | |
| [33232] | [Ornamental & Arictectural Metals] | [4,699] | [1.32] | |
| 3327 | Machine shops, turned product, & screw, nut, & bolt mfg | 9,365 | 1.48 | |
| [33271] | [Machine Shops] | [5,405] | [1.25] | Industrial Synergy |
| [33272] | [Bolts, nuts and screws] | [3,960] | [1.99] | |
| 3329 | Other fabricated metal product manufacturing | 6,253 | 1.28 | |
| [332911] | [Industrial Valve manufacturing] | [937] | [1.18] | Industrial Synergy |
| [332913] | [Plumbing Fixtures and Trim] | [750] | [3.10] | |
| [332996] | [Fabricated pipe and pipe fitting] | [736] | [1.68] | |
| [332998] | [Metal sanitary ware manufacturing] | [500] | [3.35] | Life Sciences Synergy |
| **333** | **Machinery manufacturing** | **18,207** | - | |
| 3332 | Industrial machinery manufacturing | 5,531 | 1.92 | Industrial Synergy |
| [333291] | [Paper Industry Machinery] | [796] | [2.97] | Service Sector Synergy |
| [333295] | [Semiconductor Machinery] | [2,000] | [3.34] | Computer Services Synergy |
| 3339 | Other general-purpose machinery manufacturing | 6,161 | 1.17 | Industrial Synergy |
| [33391] | [Pumps & Compressors] | [1,655] | [1.63] | Industrial Synergy |
| [33392] | [Material Handling Equipment] | [1,405] | [1.02] | Industrial Synergy |
| [333993] | [Packaging Machinery manufacturing] | [667] | [1.42] | Industrial Synergy |
| [333994] | [Industrial Process Furnaces manufacturing] | [755] | [2.88] | Industrial Synergy |
| **334** | **Computer & electronic product manufacturing** | **27,385** | **1.08** | |
| 3341 | Computer & peripheral equipment manufacturing | 3,330 | - | |
| [334119] | [Other Computer peripheral equipment manufacturing] | [2,693] | [1.92] | Computer Services Synergy |
| 3342 | Communications equipment manufacturing | 7,177 | 1.64 | Computer Services Synergy |
| [33422] | [Wireless Communications Equipment] | [6,210] | [2.53] | Computer Services Synergy |
| 3344 | Semiconductor & other electronic component mfg | 5,087 | - | |
| 3345 | Measuring, medical, & control instruments manufacturing | 10,449 | 1.44 | Life Sciences Synergy |
| [334513] | [Industrial Process Control Equipment] | [3,312] | [4.51] | Industrial Synergy |
| 3346 | Mfg & reproducing magnetic & optical media | 1,303 | 1.59 | Industrial Synergy |
| [334612] | [CD (except software) & Tape Recording Products] | [1,090] | [2.86] | Industrial Synergy |
| **335** | **Electrical equipment, appliance, & component mfg** | **7,227** | - | |
| 3351 | Electric lighting equipment manufacturing | 2,570 | 2.30 | |
| [335121] | [Residential Electric Lighting Fixtures] | [1,306] | [4.95] | |
| [335122] | [Commercial Electric Lighting Fixtures] | [976] | [2.83] | |
| 3359 | Other electrical equipment & component manufacturing | 3,750 | 1.19 | Computer Services Synergy |
| [33593] | [Wiring Devices] | [1,268] | [1.24] | Computer Services Synergy |
| **336** | **Transportation equipment manufacturing** | **18,157** | - | |
| 3363 | Motor vehicle parts manufacturing | 10,455 | - | |
| 3364 | Aerospace product & parts manufacturing | 6,167 | - | |
| **337** | **Furniture & related product manufacturing** | **7,671** | - | |
| 3371 | Household & institutional furniture & kitchen cabinet mfg | 2,920 | - | |
| 3372 | Office furniture (including fixtures) manufacturing | 4,529 | 1.74 | Service Sector Synergy |
| [337212] | Custom Architectural Woodwork | [773] | [2.13] | |
| **339** | **Miscellaneous manufacturing** | **13,305** | **1.21** | |
| 3391 | Medical equipment & supplies manufacturing | 6,097 | 1.38 | Life Sciences Synergy |
| 3399 | Other miscellaneous manufacturing | 7,208 | 1.10 | Industrial Synergy |

**Source: Delaware Valley Regional Planning Commission, October 2003.**

the region, this sector has an outstanding location quotient of 2.96. These strengths, combined with our nearly 5000 service sector jobs in life science R&D and consulting that also have location quotients above 1, outline a formidable synergy in the life sciences.

Figure 5 continues dissecting our region's manufacturing by delving into NAICS 33. This code covers the typical perceptions of manufacturing as a sector of metal and machines. It is broken into eight three-digit sub categories: primary metal, fabricated metal, machinery, computer and electronic products, electrical equipment, transportation equipment, furniture, and miscellaneous manufacturing, which include a large subcategory for medical equipment.

A number of important Knowledge Economy synergies are visible in NAICS 33. As in NAICS 32, there are overall Service Sector synergies, Industrial Synergies, and Life Science Synergies. Our strength in office furniture at 1.74 suggests an industry supporting the service sector with the furnishings necessary for white-collar workers of all fields. Moreover, our success in paper manufacturing machinery with its quotient of 2.97 reveals a synergy with our paper and printing industries of NAICS 32 that also support the knowledge economy.

Aspects of our Industrial synergies are evident throughout NAICS 33. We have strengths in iron, steel, and aluminum. We build and export all kinds of machines, from valves at 1.18 to pumps at 1.63 to industrial process furnaces at 2.88. Machine shops weigh in with over 5,400 jobs and a location quotient at 1.25, and industrial process control equipment supports 3,300 jobs and has a location quotient of 4.51.

Life Sciences are also represented, with almost half of miscellaneous manufacturing jobs in medical equipment. In this field we employ 6,000 with a location quotient of 1.38. Additionally, we have strengths in the manufacturing of metal sanitary ware, with a location quotient above 3 and in measuring, medical, and control devices, with a location quotient at 1.44. Clearly, these NAICS 33 strengths are additional evidence of our formidable expertise in this field. Without doubt, synergies are forming between these NAICS 33 classifications, NAICS 32's pharmaceutical manufacturing, and our service sector vigor in life science R&D and consulting.

Indeed, in the life science field we do not simply have synergies between industries but synergies between clusters. These phenomena were discussed previously in Analytical Report # 10, where a critical mass of interlocking industries in our region could be creating a dominant position nationally or even globally. Within NAICS 33, for example, a well-delineated cluster can be seen under code 3391 for medical equipment and supplies. Figure 6 shows that our region excels in five of the six fields into which the census bureau subdivides NAICS 3391. This cluster should be combining with other medical and life science clusters.

**FIGURE 6: Medical Equipment Cluster**

| NAICS Code | Job Description | Jobs | L.Q. Above 1 |
|---|---|---|---|
| 3391 | Medical Equipment & Supplies | 6,097 | 1.38 |
| 339111 | Laboratory apparatus & furniture mfg | 680 | 2.50 |
| 339112 | Surgical & medical instrument mfg | 2,258 | 1.40 |
| 339113 | Surgical appliance & supplies mfg | 933 | - |
| 339114 | Dental equipment & supplies mfg | 873 | 3.24 |
| 339115 | Ophthalmic goods mfg | 607 | 1.54 |
| 339116 | Dental laboratories | 746 | 1.21 |

**Source: Delaware Valley Regional Planning Commission, October 2003.**

There is one remaining set of emerging synergies of importance not visible in NAICS 33. As with the service sector, an intriguing computer industry cluster has taken shape within our region's manufacturing. While the total number of jobs in the computer cluster may be less than other regions, it is still very significant and there

is the potential it could be nurtured into something greater. In NACIS 33, this computer expertise has shown up in several unusual places. For example, while we are not a leading exporter in semi-conductors we do employ over 5,000 people in this field, and with a location quotient of 3.34 we are an exporter in semi-conductor machinery. Even more interesting are the manufacturing successes in wireless communication equipment and other peripheral computer equipment, respectively employing 6,200 and 2,700 individuals and with location quotients of 2.53 and 1.92. These strengths resemble our service sector lead in computer systems integration. Wireless is often touted as the next big thing in computers. Hopefully, synergies are forming between these fields in our region. Few would argue that it is a facet of the Knowledge Economy the Delaware Valley would be wise to nurture.

## The Sprawl Economy

The rise of the Sprawl Economy is the second manufacturing story of the Delaware Valley. Decentralization and sprawl development over the past four decades has coincided with the steady decline in manufacturing jobs. One could argue, though, that the incredible economic engine that is sprawl has sustained many aspects of our remaining manufacturing sector. Although sprawl has many negative impacts, there is no denying its role as an economic engine. Sprawl consumes more land, impacts our natural resources, and generates increasing congestion and air quality problems; but sprawl also has an economic component.

Regional economies may be viewed as three groups - governments, firms and households - engaged in a set of complex interactions. Just as the Knowledge Economy is one set of these group's interactions, the "Sprawl Economy" is another. For example, as government land use and transportation policy makes undeveloped land more accessible, households consume more of it. Additionally, as an economy heats up from its critical mass of firms with synergies and clusters, it attracts more households, or financially permits the existing ones more housing choices. Eventually these relationships achieve a critical mass, becoming an economic engine for the region. From mortgage financers, to construction contractors, to furniture movers, sprawl stimulates the local economy in a myriad of ways. Indeed, in the most recent recession, the Sprawl Economy has been one of the few bright spots of economic activity.

Obviously the first place to measure sprawl in the economy would be via the construction sector. Using location quotients, however, is problematic. The first issue is that the Census Bureau's NAICS code 23 covering construction jobs is not collected at the local level. Of greater concern is that the nature of construction jobs exposes the limitations of the location quotient. A quotient above 1 supposedly indicates an exported sector. Clearly, most local construction jobs are consumed locally, but in our region, construction usually has a quotient above 1. In our original discussion of location quotients, using the Regional Economic Information Systems data set released by the Bureau of Economic Analysis instead of the Census Bureau data, we measured construction sector location quotients by county for every year since 1969. While the region as a whole did not have high construction location quotients, several of our suburban counties did. Often these quotients declined or accelerated in relation to the march of sprawl across the region.

As seen in Figure 7, the urban counties of Philadelphia and Mercer do not have excessive construction employment; Camden, Delaware, and Montgomery counties, with many already developed municipalities, have reached their peaks; Chester and Burlington appear to have peaked recently; and the far corners of our region, Bucks and Gloucester counties, are still tending upward. Attributing these location quotient trends to the Sprawl Economy seems justifiable.

At the regional scale, there are a wide variety of manufacturing jobs that appear to be dependent on construction and the sprawl economy. Measuring manufacturing jobs is not as satisfactory as being able to measure construction jobs directly, but it does suggest some of Sprawl's economic affects. Moreover, manufacturing's relationship to sprawl—just as with the Knowledge Economy—reinforces the idea of manufacturing as a support to other sectors and other economic engines, rather than as an engine unto itself. In our discussion of manufacturing's role in the Knowledge Economy, a number of sectors where the region had location quotients of 1 or higher were not discussed. In Figures 4 and 5 these industries were marked in green. They potentially are supporting the Sprawl Economy. Figure 8 brings them together.

| FIGURE 7: Construction Sector Location Quotients Above 1 by County | | | | |
|---|---|---|---|---|
| **County** | **1969** | **1979** | **1989** | **1999** |
| Bucks | 1.21 | 1.34 | 1.48 | 1.55 |
| Chester | < 1 | 1.16 | 1.36 | 1.21 |
| Delaware | 1.23 | 1.34 | 1.22 | 1.20 |
| Montgomery | 1.47 | 1.49 | 1.28 | 1.20 |
| Philadelphia | < 1 | < 1 | < 1 | < 1 |
| Burlington | < 1 | < 1 | 1.10 | < 1 |
| Camden | 1.20 | 1.13 | 1.16 | 1.08 |
| Gloucester | 1.12 | 1.23 | 1.42 | 1.42 |
| Mercer | < 1 | < 1 | < 1 | < 1 |
| 9-County | < 1 | < 1 | < 1 | < 1 |

**Source: Delaware Valley Regional Planning Commission, October 2003**

| FIGURE 8: Sprawl Related Manufacturing Sector Jobs | | | | |
|---|---|---|---|---|
| **NAICS** | **Category** | **Jobs** | **L.Q. above 1** | **Synergy** |
| **324** | **Petroleum & coal products manufacturing** | **4707** | **2.93** | |
| [32411] | [Petroleum Refineries] | [3354] | [3.43] | Sprawl economy |
| [32412] | [Asphalt paving, roofing, manufacturing] | [375] | [1.88] | Sprawl economy |
| **325** | **Chemical manufacturing** | **21387** | **1.62** | |
| 3255 | Paint, coating, & adhesive manufacturing | 1841 | 1.64 | Sprawl economy |
| **326** | **Plastics & rubber products manufacturing** | **11455** | **-** | |
| 3261 | Plastics product manufacturing | 10393 | - | Sprawl economy |
| **331** | **Primary metal manufacturing** | **9586** | **1.05** | |
| 3311 | Iron & steel mills & ferroalloy manufacturing | 3815 | 1.70 | Sprawl economy |
| 3312 | Steel product mfg from purchased steel | 1287 | 1.32 | Sprawl economy |
| [33121] | [Iron & steel pipes and tubes] | [744] | [1.80] | Sprawl economy |
| 3313 | Aluminum & aluminum | 1296 | 1.02 | Sprawl economy |
| **332** | **Fabricated metal product manufacturing** | **28785** | **1.09** | |
| [332114] | [Custom roll forming] | [315] | [1.39] | Sprawl economy |
| 3323 | Architectural & structural metals manufacturing | 6048 | 1.06 | Sprawl economy |
| [33232] | [Ornamental & Arictectural Metals] | [4699] | [1.32] | Sprawl economy |
| 3327 | Machine shops, turned product, & screw, nut, & bolt mfg | 9365 | 1.48 | Sprawl economy |
| [33272] | [Bolts, nuts and screws] | [3960] | [1.99] | Sprawl economy |
| 3329 | Other fabricated metal product manufacturing | 6253 | 1.28 | Sprawl economy |
| [332913] | [Plumbing Fixtures and Trim] | [750] | [3.10] | Sprawl economy |
| [332996] | [Fabricated pipe and pipe fitting] | [736] | [1.68] | Sprawl economy |
| **335** | **Electrical equipment, appliance, & component mfg** | **7227** | **-** | |
| 3351 | Electric lighting equipment manufacturing | 2570 | 2.30 | Sprawl economy |
| [335121] | [Residential Electric Lighting Fixtures] | [1306] | [4.95] | Sprawl economy |
| [335122] | [Commercial Electric Lighting Fixtures] | [976] | [2.83] | Sprawl economy |
| **336** | **Transportation equipment manufacturing** | **18157** | **-** | |
| 3363 | Motor vehicle parts manufacturing | 10455 | - | Sprawl economy |
| **337** | **Furniture & related product manufacturing** | **7671** | **-** | |
| 3371 | Household & institutional furniture & kitchen cabinet mfg | 2920 | - | Sprawl economy |
| 3372 | Office furniture (including fixtures) manufacturing | 4529 | 1.74 | Sprawl economy |
| [337212] | Custom Architectural Woodwork | [773] | [2.13] | Sprawl economy |

**Source: Delaware Valley Regional Planning Commission, October 2003.**

## Economic Diversity

The last tale of manufacturing in the Delaware Valley is the most encouraging. It is the story of how our region is supported by the diversity of manufacturing industries located here. Few sectors could match manufacturing's diversity. We have talked extensively about NAICS 32 and 33 in both their knowledge and sprawl capacities. Adding the diversity of NAICS 31 of food, beverage, and textiles completes the picture of our region's manufacturing strengths. Figure 9 is a set of 3 and 4 digit codes for NAICS 31.

Industries in this code tend to be primary products that have mostly moved to less costly regions or nations. However, the Delaware Valley maintains strong export industries in NAICS 311 for food and NAICS 315 for apparel. With over 23,000 jobs and a quotient of 1.05, our food industry strengths include sweets, meats, and baked goods. Our apparel industry employs over 11,000 with a quotient of 1.03. A closer look reveals that it is almost entirely a cluster in cut-and-sew apparel, especially for women.

Indeed, the diversity of clusters in NAICS 31 is not unusual for our region. As we discussed when talking about the Delaware Valley's cluster in medical equipment, our region not only has an advantage in synergies between sectors but strong clusters within specific NAICS categories.

**FIGURE 9: Manufacturing Jobs in NAICS 31**

| NAICS | Category | Jobs | L.Q. Above 1 | Synergy |
|---|---|---|---|---|
| **311** | **Food manufacturing** | **23,115** | **1.05** | |
| 3113 | Sugar & confectionery product mfg | 1,575 | 1.23 | Diversity |
| 3116 | Meat product manufacturing | 7,660 | 1.11 | Diversity |
| 3118 | Bakeries & tortilla manufacturing | 9,137 | 2.05 | Diversity |
| **312** | **Beverage & tobacco product mfg** | **2,314** | **-** | |
| **313** | **Textile mills** | **3,218** | **-** | |
| **314** | **Textile product mills** | **2,030** | - | |
| **315** | **Apparel manufacturing** | **11,080** | **1.03** | |
| 3152 | Cut & sew apparel manufacturing | 9,592 | 1.15 | Diversity |
| 3159 | Apparel accessories & other apparel mfg | 1,022 | 1.23 | Diversity |
| **316** | **Leather & allied product manufacturing** | **269** | - | |

**Source: Delaware Valley Regional Planning Commission, October 2003.**

Appendix A displays 10 sizable and easily definable employment clusters across all three of the two-digit manufacturing NAICS codes of 31, 32, and 33. Each one of these clusters employs at least 5,000 individuals and is an export leader with location quotients above 1 in most of its sub-categories. At a glance, these clusters include:

- Medical Equipment
- Printing
- Converted Paper Product
- Women's Apparel
- Bakeries
- Meat Products
- Office Furniture
- Metals
- Chemicals
- Precision Machines

Additionally, these job clusters are not the only type of cluster in the region. The sheer number of firms involved in manufacturing in the Delaware Valley is another way critical Economic Diversity expresses itself

here. Figure 10 displays the number of firms for 3-digit manufacturing NAICS codes under NAICS 31, 32, and 33. As might be expected, in most of the disciplines in which we have a jobs location quotient above 1, we hold a similarly high quotient in the number of firms.

Moreover, a cluster in firms as well as jobs bodes well for future economic development. Most likely many of these firms are small. Smaller firms often make up the majority of employment and create more jobs than larger, more established firms. From one or several of these smaller firms the seeds of a new industry, centered in our region, could arise, a kind of insurance policy for our economic future.

**Figure 10: Firm & Job Manufacturing Location Quotients**

| NAICS | Job Description | Firms | Location Quotient | Jobs | Location Quotient | Jobs per Firm |
|---|---|---|---|---|---|---|
| **31 Total** | **Food, Beverage, & Textiles** | **1,092** | | **42,026** | | |
| ***311*** | ***Food manufacturing*** | ***543*** | ***1.13*** | ***23,115*** | ***1.05*** | 43 |
| 312 | Beverage & tobacco product manufacturing | 31 | - | 2,314 | - | |
| 313 | Textile mills | 96 | 1.12 | 3,218 | - | 34 |
| 314 | Textile product mills | 122 | - | 2,030 | - | |
| 315 | Apparel manufacturing | 277 | - | 11,080 | 1.03 | 40 |
| 316 | Leather & allied product manufacturing | 23 | - | 269 | - | |
| **NAICS** | **Job Description** | **Firms** | **Location Quotient** | **Jobs** | **Location Quotient** | **Jobs per Firm** |
| **32 Total** | **Wood, Petroleum, & Chemicals** | **2,075** | | **79,559** | | |
| 321 | Wood product manufacturing | 125 | - | 2,080 | - | |
| 322 | Paper manufacturing | 150 | 1.40 | 11,236 | 1.31 | 75 |
| ***323*** | ***Printing & related support activities*** | ***945*** | ***1.21*** | ***23,739*** | ***1.90*** | 25 |
| 324 | Petroleum & coal products manufacturing | 55 | 1.41 | 4,707 | 2.93 | 86 |
| ***325*** | ***Chemical manufacturing*** | ***314*** | ***1.28*** | ***21,387*** | ***1.62*** | 68 |
| 326 | Plastics & rubber products manufacturing | 277 | - | 11,455 | - | |
| 327 | Nonmetallic mineral product manufacturing | 209 | - | 4,955 | - | |
| **NAICS** | **Job Description** | **Firms** | **Location Quotient** | **Jobs** | **Location Quotient** | **Jobs per Firm** |
| **33 Total** | **Metal & Machines** | **3,439** | | **130,323** | | |
| 331 | Primary metal manufacturing | 86 | - | 9,586 | 1.05 | 111 |
| ***332*** | ***Fabricated metal product manufacturing*** | ***1,154*** | ***1.02*** | ***28,785*** | ***1.09*** | 25 |
| 333 | Machinery manufacturing | 524 | - | 18,207 | - | |
| ***334*** | ***Computer & electronic product manufacturing*** | ***448*** | ***1.41*** | ***27,385*** | ***1.08*** | 61 |
| 335 | Electrical equipment, appliance, & component mfg | 155 | 1.23 | 7,227 | - | |
| 336 | Transportation equipment manufacturing | 146 | - | 18,157 | - | |
| 337 | Furniture & related product manufacturing | 311 | - | 7,671 | - | |
| 339 | Miscellaneous (Including Medical) manufacturing | 615 | 1.07 | 13,305 | 1.21 | 22 |
| **31-33** | **Manufacturing Sector** | **6,606** | | **251,908** | | |

**Source: Delaware Valley Regional Planning Commission, October 2003.**

## Manufacturing Productivity

Now that we know that manufacturing thrives in a myriad of industries across our region, connecting in complex ways to the Knowledge and Sprawl Economies, while providing breadth to our economy via diversity, it is fair to ask about the quality of these jobs.

At first glance, most manufacturing jobs do not look as desirable as other occupational categories. According to the Occupational Employment Statistics Wage Survey produced by the New Jersey Department of Labor, in the New Jersey half of the DVRPC region, manufacturing jobs had a mean hourly wage of only $15 an hour in 2000 or a mean yearly salary of $31,000. While this may be better than many so called “burger-flipping” occupations, it is lower than professional services in both the private and public sectors and even compares

poorly to construction and extraction occupations. In the same South Jersey area, construction jobs paid on average $20 an hour or $42,000 a year. Again, however, we should not be too quick to reject manufacturing. It may still be providing a number of quality positions.

According to the Progressive Policy Institute "Workers employed in export-oriented firms earn 10 percent more than workers in similar firms that export less, or don't export at all." With location quotients above 1, many of our region's industries are supposedly export industries. Knowing exactly how many of these jobs are the potentially higher paying "basic", export-oriented jobs, requires digging a little deeper into location quotient methodology.

It is important to remember that only the portion above 1 of the location quotient actually represents exporting jobs. Apparel manufacturing, for example, employs 11,080 individuals in our region and has a location quotient of 1.03. Therefore, 350 of these jobs can be considered basic, suggesting that not many of these jobs are higher paying. Many other industries fare much better, however, and are displayed in Figure 11. Ranking industries by the number of basic jobs produces a new list of leaders in the Delaware Valley. The grand total of these higher paying jobs is 33,838.

**Figure 11: Basic, Higher Paying "Export-oriented" Jobs in the Delaware Valley**

| NAICS | Job Description | Jobs | Location Quotient | Basic Jobs | Top Five |
|---|---|---|---|---|---|
| **31 Total** | **Food, Beverage, & Textiles** | 42,026 | | | |
| 311 | Food manufacturing | 23,115 | 1.05 | 1,172 | |
| 312 | Beverage & tobacco product manufacturing | 2,314 | - | | |
| 313 | Textile mills | 3,218 | - | | |
| 314 | Textile product mills | 2,030 | - | | |
| 315 | Apparel manufacturing | 11,080 | 1.03 | 351 | |
| 316 | Leather & allied product manufacturing | 269 | - | | |
| **32 Total** | **Wood, Petroleum, & Chemicals** | 79,559 | | | |
| 321 | Wood product manufacturing | 2,080 | - | | |
| ***322*** | ***Paper manufacturing*** | 11,236 | 1.31 | 2,630 | ***4*** |
| ***323*** | ***Printing & related support activities*** | 23,739 | 1.90 | 11,235 | ***1*** |
| ***324*** | ***Petroleum & coal products manufacturing*** | 4,707 | 2.93 | 3,098 | ***3*** |
| ***325*** | ***Chemical manufacturing*** | 21,387 | 1.62 | 8,196 | ***2*** |
| 326 | Plastics & rubber products manufacturing | 11,455 | - | | |
| 327 | Nonmetallic mineral product manufacturing | 4,955 | - | | |
| **33 Total** | **Metal & Machines** | 130,323 | | | |
| 331 | Primary metal manufacturing | 9,586 | 1.05 | 461 | |
| 332 | Fabricated metal product manufacturing | 28,785 | 1.09 | 2,310 | |
| 333 | Machinery manufacturing | 18,207 | - | | |
| 334 | Computer & electronic product manufacturing | 27,385 | 1.08 | 2,049 | |
| 335 | Electrical equipment, appliance, & component mfg | 7,227 | - | | |
| 336 | Transportation equipment manufacturing | 18,157 | - | | |
| 337 | Furniture & related product manufacturing | 7,671 | - | | |
| ***339*** | ***Miscellaneous (Including Medical) mfg*** | 13,305 | 1.21 | 2,336 | ***5*** |
| **31-33** | **Manufacturing Sector** | 251,908 | | 33,838 | |

**Source: Delaware Valley Regional Planning Commission, October 2003**

If this seems small, it is also important to remember that this number represents a dynamic set of jobs. Since these jobs are dedicated solely to wealth creation, they are generating more activity. This is known as a multiplier, meaning that every one of these jobs supports numerous others. Whereas most multipliers hover around 2, manufacturing sector multipliers are often closer to 3 or higher. Manufacturing Sector experts at the Delaware Valley Industrial Resource Center believe the region's manufacturing multiplier is at least 2.7.

Additionally, if these jobs are more productive ones, it is an indication that this wealth generation process should continue growing lucrative positions into the future.

Unfortunately, judging productivity is another example of the limitations of simple location quotient analysis. The quotient assumes that our region's productivity is equivalent to the nation's productivity. If local productivity is actually higher, we are underestimating the number of our region's higher paying, export-oriented jobs. If local productivity is lower, we may be worse off in manufacturing than our analysis has suggested thus far. There is no data for manufacturing productivity in the Delaware Valley specifically, but by using state manufacturing productivity data as a proxy, one can safely assume our region is more productive, producing more high paying manufacturing jobs, than most regions. Figure 12 displays productivity data by state in 2000. New Jersey, Maryland and Delaware all have above average manufacturing productivity, whereas Pennsylvania's productivity is nearly equivalent to the nation's productivity. Located in the middle of the Northeast corridor, our region is probably above average in productivity as well.

**Figure 12: Manufacturing Productivity by State**

**Value Added by Manufacturing**

| Geography | Value per Production Worker | Value per Production Man-hour | Value Per Production Wages |
|---|---|---|---|
| United States | 167,456 | 83 | 5.51 |
| Delaware | 195,146 | 101 | 5.71 |
| Maryland | 172,240 | 86 | 5.16 |
| New Jersey | 197,787 | 99 | 6.22 |
| Pennsylvania | 161,721 | 80 | 5.21 |

**Source: US Department of Commerce, 2000 Annual Survey of Manufacturers, March 2002**

## Manufacturing for the Future

Manufacturing may have an image problem. Only 10% of our region's jobs are in manufacturing, but clearly many of those jobs support our economy and are vital to the health of the region. What can we expect from this sector in the future?

The data shows that manufacturing is not dead in the Delaware Valley. Moreover, because manufacturing has declined before does not mean it will decline indefinitely. The manufacturing journal Industry Week states it well; "History tells us that new technology and innovation will return U.S. manufacturing to its former glory. In the '70s, low-cost foreign manufacturers captured the once-lucrative chip manufacturing business. U.S. manufacturers roared back with advances in microprocessors and launched the PC revolution. By the 1980s, PC manufacturing—the high technology of the day—moved offshore. Once again, U.S. high-tech manufacturing regrouped with new technologies clustered around the Internet and high-speed telecommunications. " (Industry Week).

On the other hand, one should always be mindful of historical data's limits. While manufacturing has strengths in our region now, it may not always. The future of manufacturing in the Delaware Valley could be bleak or bright. We could "roar back" or let ourselves fizzle.

The future of the Sprawl economy for example looks shaky. Whether one believes that predictions of oil-peak (the point at which the fossil fuels vital to our current industrial arrangements pass the point of maximum supply and become increasingly more costly to extract) will make sprawl unwieldy soon, or that sprawl ultimately falls victim to its own success by diminishing quality of life, or that government policies will redirect growth, too many factors seem stacked against sprawl as an endless economic stimulant. A variety of factors—water and air quality issues, continuing traffic snarls, volatile energy costs, and even public health concerns—suggest a change will come.

The Knowledge Economy, on the other hand, looks bright. Because Sprawl and the Knowledge Economies have shared the same historical space, some individuals mistakenly link the two phenomena, but there is no

reason to suggest that knowledge jobs will not continue to provide employment under a different set of living arrangements. It will be up to us to detach the region's economy from Sprawl while connecting it more solidly with Knowledge.

Fortunately, the key knowledge services and supportive manufacturing of our region look particularly promising. As the US population ages, the demand for our life science and pharmaceutical and medical products will likely increase. Strengths in wireless technologies and systems integration could prove lucrative, or our region could have an advantage in disciplines only beginning to take shape from the building blocks of our chemical or engineering expertise.

The new field of nanotechnology, for instance, is blurring the lines between services and manufacturing. Nanotechnology is the science of altering materials at the atomic level. Recognizing its promise, the federal government in November of 2000 dedicated millions of dollars for nanotechnology research. This science has the potential to alter all types of manufacturing. The National Science Foundation has predicted a $1 trillion market by 2015 for nano products. The Delaware Valley could capitalize on these developments as our region's strengths become intertwined. Nanotechnology could bring together life sciences, engineering, chemicals and other disciplines in which we excel. The recent Road Map for Regional Growth prepared by Innovation Philadelphia and the Greater Philadelphia Chamber of Commerce identifies nanotechnology as one of the seven prime targets for opportunity for regional innovation and growth. In fact, of those seven targets, three – nanotechnology, chemicals, and rotocraft – are manufacturing sectors.

Whether it is through nanotechnology, biotechnology, or something yet unknown, this high rate of change in our economy—especially visible in the manufacturing sector—is known as churn. Focusing solely on the shift to services from manufacturing, we may have been focusing on the churn in our economy and not its promise. As we have seen in this report, underneath the aggregate numbers of manufacturing decline exist many industry successes. But we should not stop here.

Again using nanotechnology as an example, the Ben Franklin Technology Partners believes this is one of several emerging fields in which our region could excel and is trying to foster links between it and our current industry clusters. In collaboration with local universities, they have established an institute for nano-based economic development. Specifically, they hope to link it to our dominant pharmaceutical and medical strengths. In their words, the institute hopes to be a "catalyst that facilitates the research, development and commercialization of nano technologies real world applications in biomedical research, disease diagnosis, and therapy". Whether or not "Medical Nano" becomes the next big industry of our region, collaborations such as these, which try to harness churn and propel our region into a new economic era, are more likely to be successful than chasing big corporations or industrial sectors of the past. The region's lackluster success in reintroducing shipbuilding to our port comes to mind.

Scarce economic development dollars should be targeted to growth opportunities. New policies should not only be familiar with emerging technologies, but also the emerging players. These players include the smaller firms which will grow into the big firms of tomorrow, the entrepreneurs who will make it happen, and the research entities that will have the critical knowledge for success. Above all, our economic development policy should stress linkages between these groups to equip them with the latest skills, knowledge, and technologies, which—like the churning global economy— will be changing at a frenetic pace.

Indeed, even the recent revision of NAICS codes to better define manufacturing jobs, on which the research in this report has been based, may already be obsolete. And while it has been interesting to see how our economy has changed, knowing which sector has been up or down in recent decades does not provide a complete road map to tomorrow. Knowing the past is helpful, but divining the future is critical. The key question now, and which we will address in our next report, is how to harness our past to create a vibrant economy of the future, whether that be in services, manufacturing, or a hybrid to the two. Churn will accelerate. From Chester, to Philadelphia, to Camden and Trenton, the next wave of economic expansion could spread up the Delaware Valley. We must ensure that we are not missing its opportunities.

## Appendix A

| Major Manufacturing Clusters of the Delaware Valley | | | |
|---|---|---|---|
| **NAICS Code** | **Cluster Description** | **Jobs** | **LQ Above 1** |
| **3391** | **Medical Equipment & Supplies** | **6,097** | **1.38** |
| 339111 | Laboratory apparatus & furniture manufacturing | 680 | 2.50 |
| 339112 | Surgical & medical instrument manufacturing | 2,258 | 1.40 |
| 339113 | Surgical appliance & supplies manufacturing | 933 | - |
| 339114 | Dental equipment & supplies manufacturing | 873 | 3.24 |
| 339115 | Ophthalmic goods manufacturing | 607 | 1.54 |
| 339116 | Dental laboratories | 746 | 1.21 |
| **323** | **Printing & related support activities** | **23,739** | **1.90** |
| 323110 | Commercial lithographic printing | 12,503 | 2.02 |
| 323111 | Commercial gravure printing | 476 | 1.37 |
| 323112 | Commercial flexographic printing | 613 | 1.34 |
| 323113 | Commercial screen printing | 881 | - |
| 323114 | Quick printing | 856 | 1.09 |
| 323116 | Manifold business form printing | 2,355 | 37.58 |
| 323117 | Book printing | 514 | - |
| 323119 | Other commercial printing | 1,419 | 1.94 |
| 323121 | Trade binding & related work | 983 | 2.00 |
| 323122 | Prepress services | 2,693 | 2.15 |
| **3222** | **Converted paper product manufacturing** | **9,347** | **1.66** |
| 32221 | Paperboard container manufacturing | 4,185 | 1.35 |
| 32222 | Paper bag & coated & treated paper manufacturing | 2,395 | 2.10 |
| 32223 | Stationery product manufacturing | 895 | 1.27 |
| 32229 | Other converted paper product manufacturing | 1,872 | 2.72 |
| **3152** | **Cut & sew apparel manufacturing** | **9,592** | **1.15** |
| 31521 | Cut & sew apparel contractors | 2,054 | - |
| 31522 | Men's & boys' cut & sew apparel manufacturing | 3,020 | 1.16 |
| 31523 | Women's & girls' cut & sew apparel manufacturing | 4,155 | 1.77 |
| 315231 | Women's & girls' cut/sew lingerie & nightwear manufacturing | NA | NA |
| 315232 | Women's & girls' cut & sew blouse & shirt manufacturing | 1,002 | 2.57 |
| 315233 | Women's & girls' cut & sew dress manufacturing | 919 | 2.07 |
| 315234 | Women's & girls' cut & sew suit, coat, skirt manufacturing | 1,916 | 6.31 |
| 315239 | Women's & girls' cut & sew other outerwear manufacturing | NA | NA |
| 315299 | All other cut & sew apparel manufacturing | 317 | 1.57 |
| **3118** | **Bakeries & tortilla manufacturing** | **9,137** | **2.05** |
| 311811 | Retail bakeries | 1,620 | 2.49 |
| 311812 | Commercial bakeries | 4,173 | 1.70 |
| 311813 | Frozen cakes, pies, & other pastries manufacturing | 1,426 | 6.33 |
| 311821 | Cookie & cracker manufacturing | 1,750 | 2.73 |
| 311822 | Flour mixes & dough mfg from purchased flour | 346 | 1.48 |
| **3372** | **Office furniture (including fixtures) manufacturing** | **4,529** | **1.74** |
| 337211 | Wood office furniture manufacturing | NA | NA |
| 337212 | Custom architectural woodwork & millwork manufacturing | 773 | 2.13 |
| 337214 | Office furniture (except wood) manufacturing | 1,750 | 2.65 |
| 337215 | Showcase, partition, shelving, & locker mfg | 1,821 | 1.62 |
| **3116** | **Meat product manufacturing** | **7,660** | **1.11** |
| 31161 | Animal slaughtering & processing | 7,660 | 1.11 |
| 311611 | Animal (except poultry) slaughtering | 3,359 | 1.58 |
| 311612 | Meat processed from carcasses | 2,710 | 2.05 |
| **331** | **Primary metal manufacturing** | **9,586** | **1.05** |
| 3311 | Iron & steel mills & ferroalloy manufacturing | 3,815 | 1.70 |
| 3312 | Steel product mfg from purchased steel | 1,287 | 1.32 |

| Appendix A (continued) | | | |
|---|---|---|---|
| **NAICS Code** | **Cluster Description** | **Jobs** | **LQ Above 1** |
| 3313 | Alumina & aluminum production & processing | 1,296 | 1.02 |
| 3314 | Nonferrous metal (except aluminum) production & processing | 1,271 | 1.02 |
| 3315 | Foundries | 1,917 | - |
| **325** | **Chemical manufacturing** | **21,387** | **1.62** |
| 3251 | Basic chemical manufacturing | 4,265 | 1.41 |
| 3253 | Pesticide, fertilizer, & other agricultural chemical mfg | NA | NA |
| 3252 | Resin, syn. rubber, & artificial & syn. fibers & filaments mfg | 3,183 | 1.86 |
| 3254 | Pharmaceutical & medicine manufacturing | 8,961 | 2.96 |
| 3255 | Paint, coating, & adhesive manufacturing | 1,841 | 1.64 |
| 3256 | Soap, cleaning compound, & toilet preparation mfg | 1,173 | - |
| 3259 | Other Chemical Product | 1,806 | - |
| **3339** | **Other general-purpose machinery mfg** | **6,161** | **1.17** |
| 33391 | Pump & compressor manufacturing | 1,655 | 1.63 |
| 33392 | Material handling equipment manufacturing | 1,405 | 1.02 |
| 33399 | All other general-purpose machinery manufacturing | 3,101 | 1.08 |

**Source: Delaware Valley Regional Planning Commission, October 2003.**

Analytical report #11 is the latest in a series of bulletins designed to complement our traditional data releases. For more information on Analytical Data Reports, please visit the Delaware Valley Regional Planning Commission's website (www.dvrpc.org) or contact DVRPC at the telephone number below.

The Delaware Valley Regional Planning Commission was established in 1965 by interstate compact between Pennsylvania and New Jersey to plan for the orderly growth and development of the region, and to provide a variety of planning and technical assistance services responding to regional issues. DVRPC maintains a significant database for twenty-eight counties encompassing New Jersey, Delaware, Pennsylvania and Maryland. Included in the database are data profiles at the regional, county, and municipal level, and for other census geography as requested. DVRPC produces a diverse range of services, including demographic and economic data and projections; mapping and aerial photography; computer assisted mapping; geographic information systems; impact studies; and policy and program development.

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