New Jersey's
TECHNOLOGY Industry Cluster

Prepared by:

New Jersey Department of Labor & Workforce Development

Office of Research & Information

Bureau of Labor Market Information

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THE GOAL OF THIS REPORT IS TO GET AN "IDEA" OF WHAT TECHNOLOGY MEANS TO NEW JERSEY

Identify the types of industries and establishments that make up the technology industry cluster based on a standard industry classification system

Describe any similarities and differences among its components with regard to such variables as employment, wage, occupation type, education, and demographic characteristics

Examine any present distinctions within the cluster and its components that give New Jersey a competitive advantage compared to neighboring states, regions or the nation, or show areas where New Jersey could improve to add to the state's economy

Analyze the current state of the technology industry cluster and provide an outlook for employment into the future
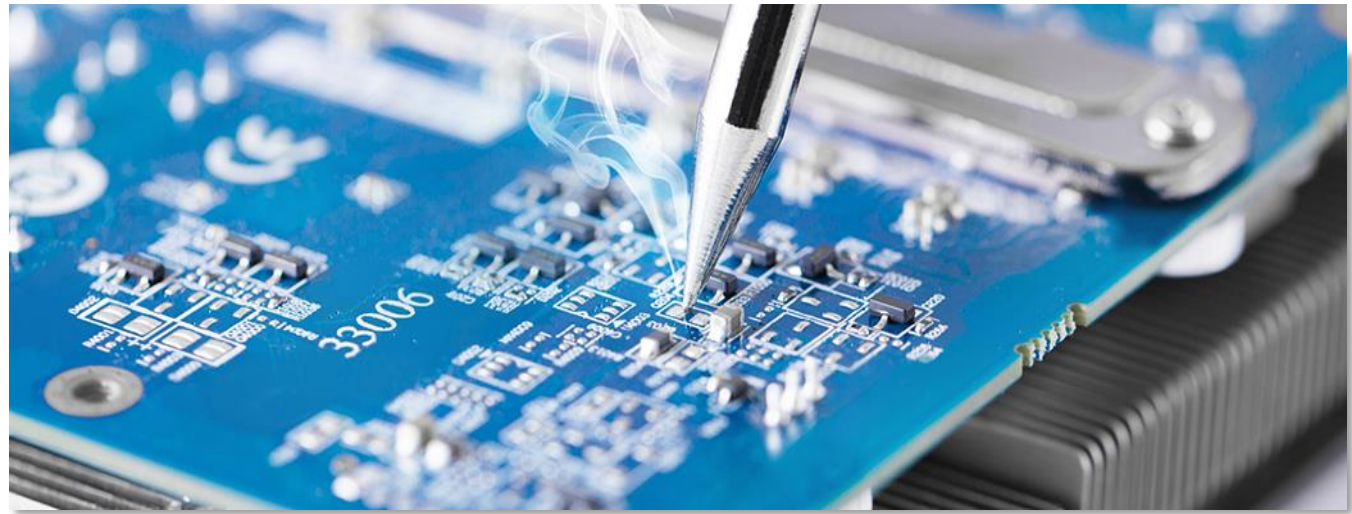
TECHNOLOGY INDUSTRY CLUSTER: OVERVIEW

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS)
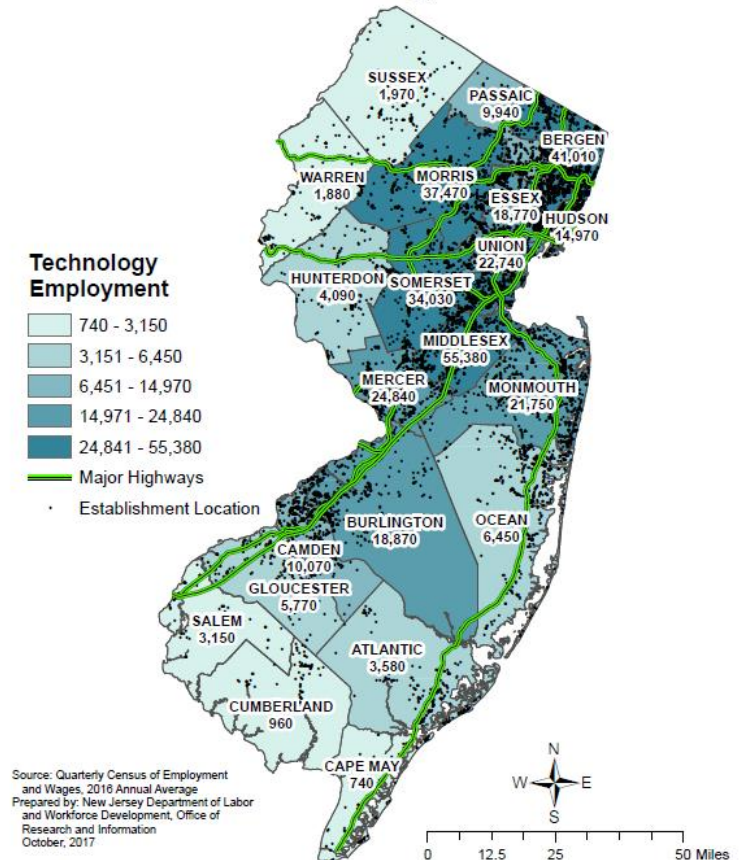
NAICS and Industry Description

NAICS	Industry Description
2111	Oil and gas extraction
2211	Power generation and supply
3241	Petroleum and coal products manufacturing
3251	Basic chemical manufacturing
3252	Resin, rubber, and artificial fibers mfg.
3254	Pharmaceutical and medicine manufacturing
3332	Industrial machinery manufacturing
3333	Commercial and service industry machinery
3336	Turbine and power transmission equipment mfg.
3341	Computer and peripheral equipment mfg.
3342	Communications equipment manufacturing
3343	Audio and video equipment manufacturing
3344	Semiconductor and electronic component mfg.
3345	Electronic instrument manufacturing
3346	Magnetic media manufacturing and reproducing
3353	Electrical equipment manufacturing
3364	Aerospace product and parts manufacturing
4234	Commercial equip. merchant wholesalers
4236	Electric goods merchant wholesalers
4242	Druggists' goods merchant wholesalers
4861	Pipeline transportation of crude oil (NA, QCEW)
5112	Software publishers
5171	Wired telecommunications carriers
5172	Wireless telecommunications carriers
5174	Satellite telecommunications
5179	Other telecommunications
5182	Data processing and related services
5191	Other information services
5211	Monetary authorities - central bank
5413	Architectural and engineering services
5415	Computer systems design and related services
5416	Management and technical consulting services
5417	Scientific research and development services

The technology cluster was expanded to reflect the new U.S. Bureau of Labor Statistics definition of technology industries (2013). BLS designated NAICS industries as technology based on concentration levels of Science, Technology, Engineering & Math (STEM) occupations within the industries

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER EMPLOYMENT OVERVIEW

- In 2016, New Jersey's technology cluster accounted for 366,330 jobs or 10.8 percent of all private sector employment statewide. Nationally the cluster was responsible for 9.4 percent of all private sector employment.

- Annual average wage for the technology cluster was $118,210 in 2016 or 189.4 percent of the statewide average ($62,420) for all industries. Employers in the industry paid over $43 billion in wages, or 20.5 percent of the total wages paid in all industries.

- Employment within the technology cluster can primarily be found within: professional, scientific and technical services (50.9%), manufacturing (17.5%), wholesale trade (15.8%), and information (13.7%).

- From 2006 to 2016 employment in the cluster peaked in 2007 at 392,970 jobs.

Technology Employment and Establishment Locations New Jersey, 2016

SUSSEX 1,970
PASSAIC 9,940
BERGEN 41,010
WARREN 1,880
MORRIS 37,470
ESSEX 18,770
HUDSON 14,970
UNION 22,740
HUNTERDON 4,090
SOMERSET 34,030
MIDDLESEX 55,380
MERCER 24,840
MONMOUTH 21,750
BURLINGTON 18,870
OCEAN 6,450
CAMDEN 10,070
GLOUCESTER 5,770
SALEM 3,150
ATLANTIC 3,580
CUMBERLAND 960
CAPE MAY 740

Technology Employment
- 740 - 3,150
- 3,151 - 6,450
- 6,451 - 14,970
- 14,971 - 24,840
- 24,841 - 55,380
— Major Highways
· Establishment Location

Source: Quarterly Census of Employment and Wages, 2016 Annual Average
Prepared by: New Jersey Department of Labor and Workforce Development, Office of Research and Information
October, 2017

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TECHNOLOGY INDUSTRY CLUSTER: EMPLOYMENT ANALYSIS

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
ALL PRIVATE SECTOR VS. TECHNOLOGY EMPLOYMENT, 2006-2016

Employment Index Year 2006 = 100%

— Technology   — Total NJ Private Employment
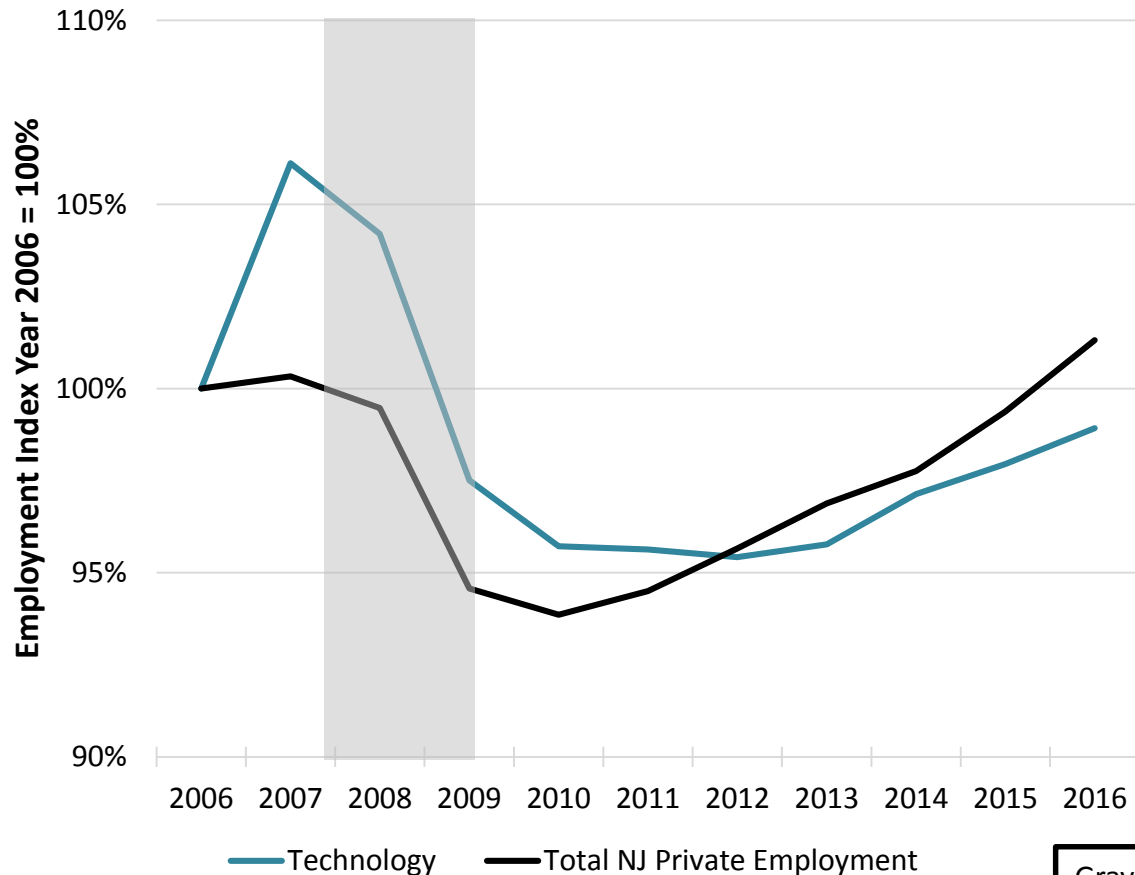
- After experiencing a 4.2 percent growth from 2006 to 2008, the technology industry declined sharply from 2007 to 2010 (-10.7%) before leveling out from 2010 to 2013 (+0.1%). The technology industry experienced growth from 2013 to 2016 (+3.3%), and is currently below the 2006 employment level -1.1%).

- NJ private sector employment has experienced more growth than the technology industry since 2011 (+7.2% vs. 3.4%).

Gray area denotes U.S. economic recession as defined by the National Bureau of Economic Research (NBER)

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
10-YEAR TECHNOLOGY CLUSTER EMPLOYMENT TREND, 2006-2016
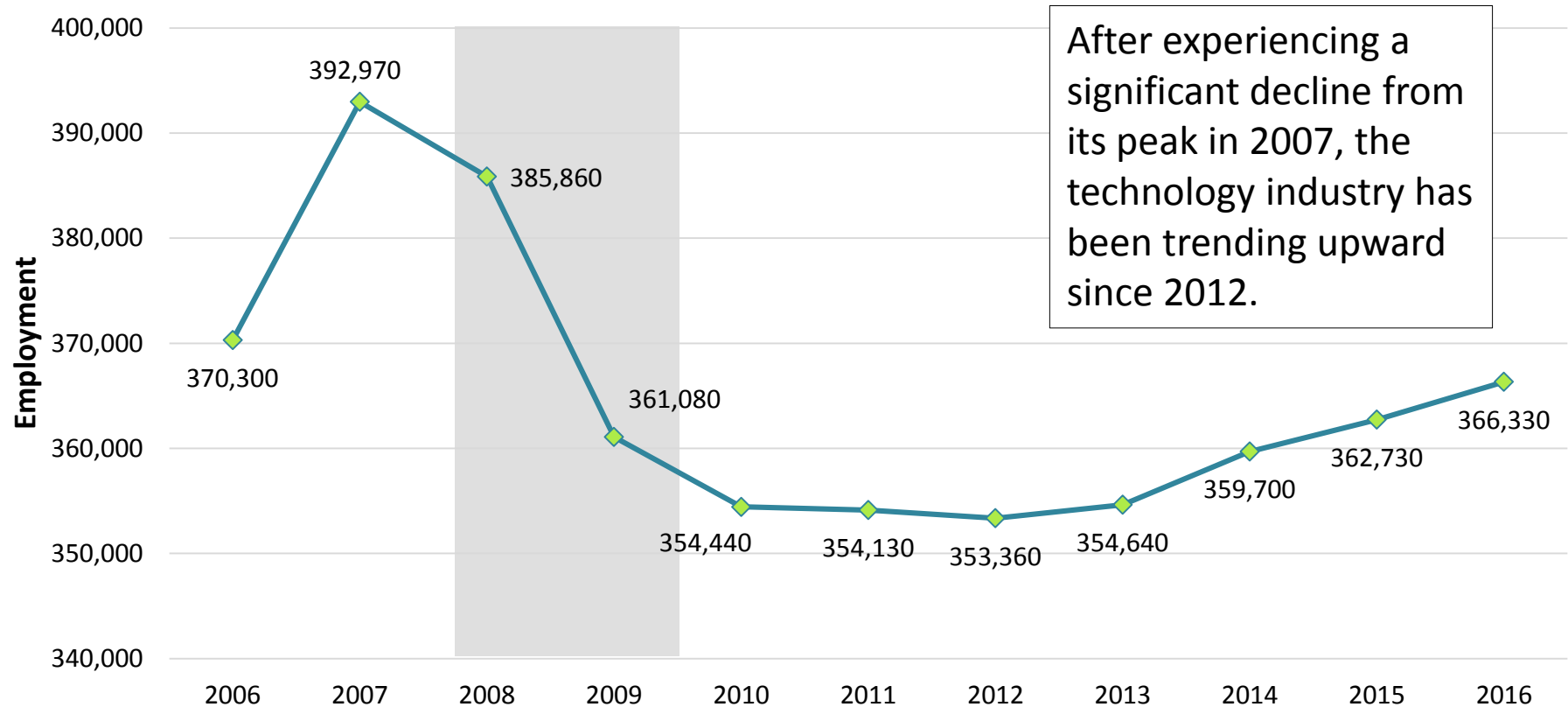
After experiencing a significant decline from its peak in 2007, the technology industry has been trending upward since 2012.

Gray area denotes U.S. economic recession as defined by the National Bureau of Economic Research (NBER)

Employment values by year: 2006: 370,300; 2007: 392,970; 2008: 385,860; 2009: 361,080; 2010: 354,440; 2011: 354,130; 2012: 353,360; 2013: 354,640; 2014: 359,700; 2015: 362,730; 2016: 366,330

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
PERCENT EMPLOYMENT BY COMPONENT SECTOR, 2016

2016 Employment

Pie chart with the following segments:
- Professional 51%
- Manufacturing 17%
- Wholesale 16%
- Information 14%
- Utilities 2%
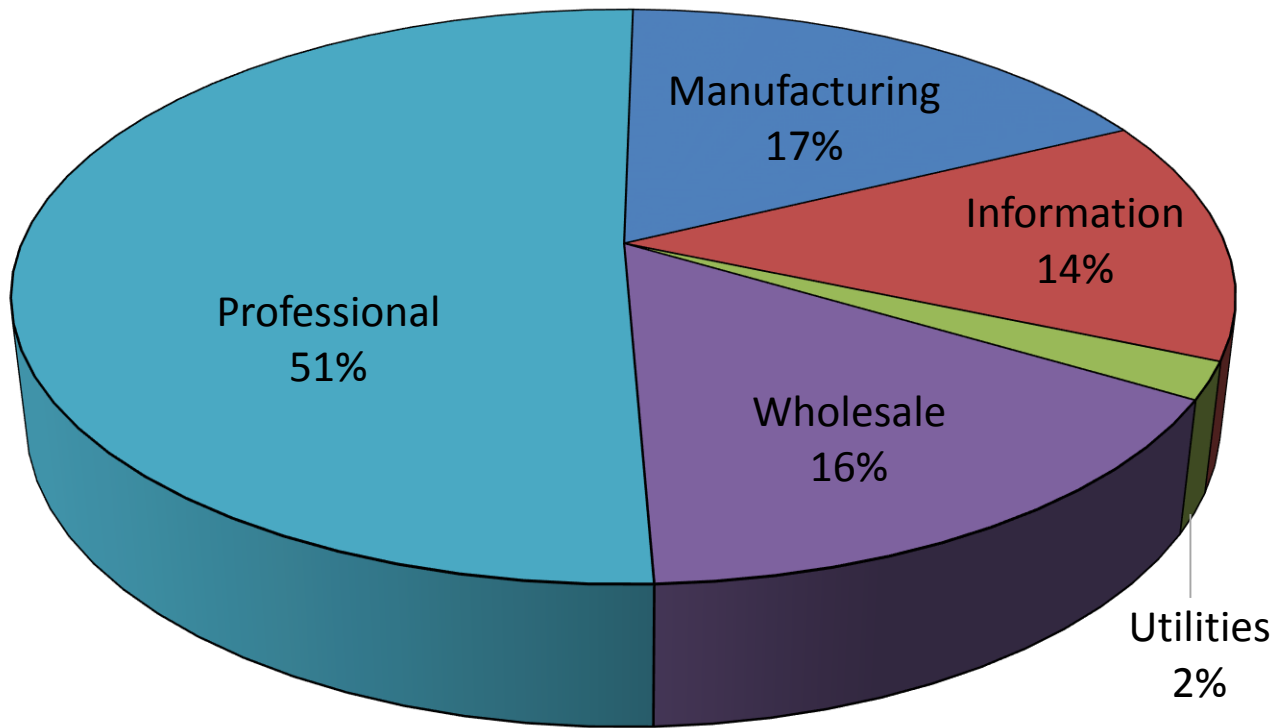
- Professional, scientific, and technical services industries accounted for more than half of the NJ technology cluster with 186,560 employment in 2016.

- Computer systems design and related services represented the most of this subsector with near 72,890 employment.

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NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER COMPONENT SECTORS, 2016 ANNUAL AVERAGES

Description	Units	Average Employment	Wages	
			Average	Total
All Private Sector Industries	**258,570**	**3,382,840**	**$62,420**	**$211,171,969,360**
Technology Industry Cluster	**27,550**	**366,330**	**$118,210**	**$43,303,459,650**
Manufacturing	1,530	63,960	$115,810	$7,407,120,460
Wholesale Trade	3,170	57,890	$119,220	$6,901,820,970
Information	2,520	50,270	$118,340	$5,948,838,090
Professional, Scientific, and Technical Services	20,140	186,560	$118,190	$22,048,695,220
Other	185	7,660	$130,230	$996,984,920

- Nearly ¾ of all business establishments in the technology cluster were in the professional, scientific and technical services sector in 2016.

- The average wage for the utilities subsector was more than double the NJ total private sector average wage.

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NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
TOP COMPONENT INDUSTRIES RANKED BY EMPLOYMENT, 2016

2016 Employment

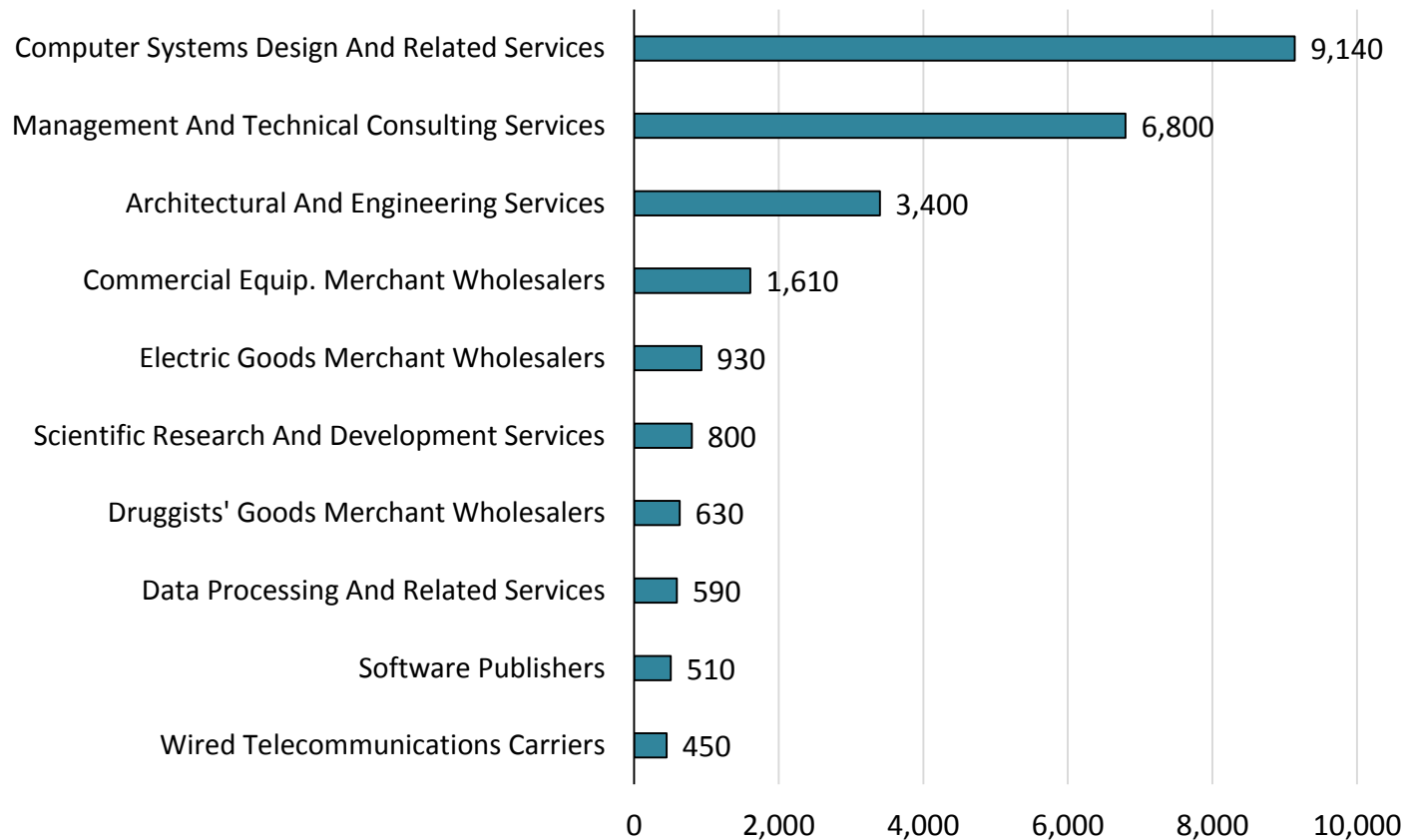| Industry	Employment
Computer Systems Design And Related Services	72,890
Management And Technical Consulting Services	45,860
Architectural And Engineering Services	37,370
Scientific Research And Development Services	30,440
Commercial Equip. Merchant Wholesalers	28,260
Wired Telecommunications Carriers	23,920
Pharmaceutical And Medicine Manufacturing	22,860
Druggists' Goods Merchant Wholesalers	16,050
Electric Goods Merchant Wholesalers	13,580
Electronic Instrument Manufacturing	12,480

Within the technology cluster, over 82.9 percent of employment was found in only ten industries in 2016.

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NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
TOP COMPONENT INDUSTRIES RANKED BY ESTABLISHMENTS, 2016

2016 Establishments

Industry	Establishments
Computer Systems Design And Related Services	9,140
Management And Technical Consulting Services	6,800
Architectural And Engineering Services	3,400
Commercial Equip. Merchant Wholesalers	1,610
Electric Goods Merchant Wholesalers	930
Scientific Research And Development Services	800
Druggists' Goods Merchant Wholesalers	630
Data Processing And Related Services	590
Software Publishers	510
Wired Telecommunications Carriers	450

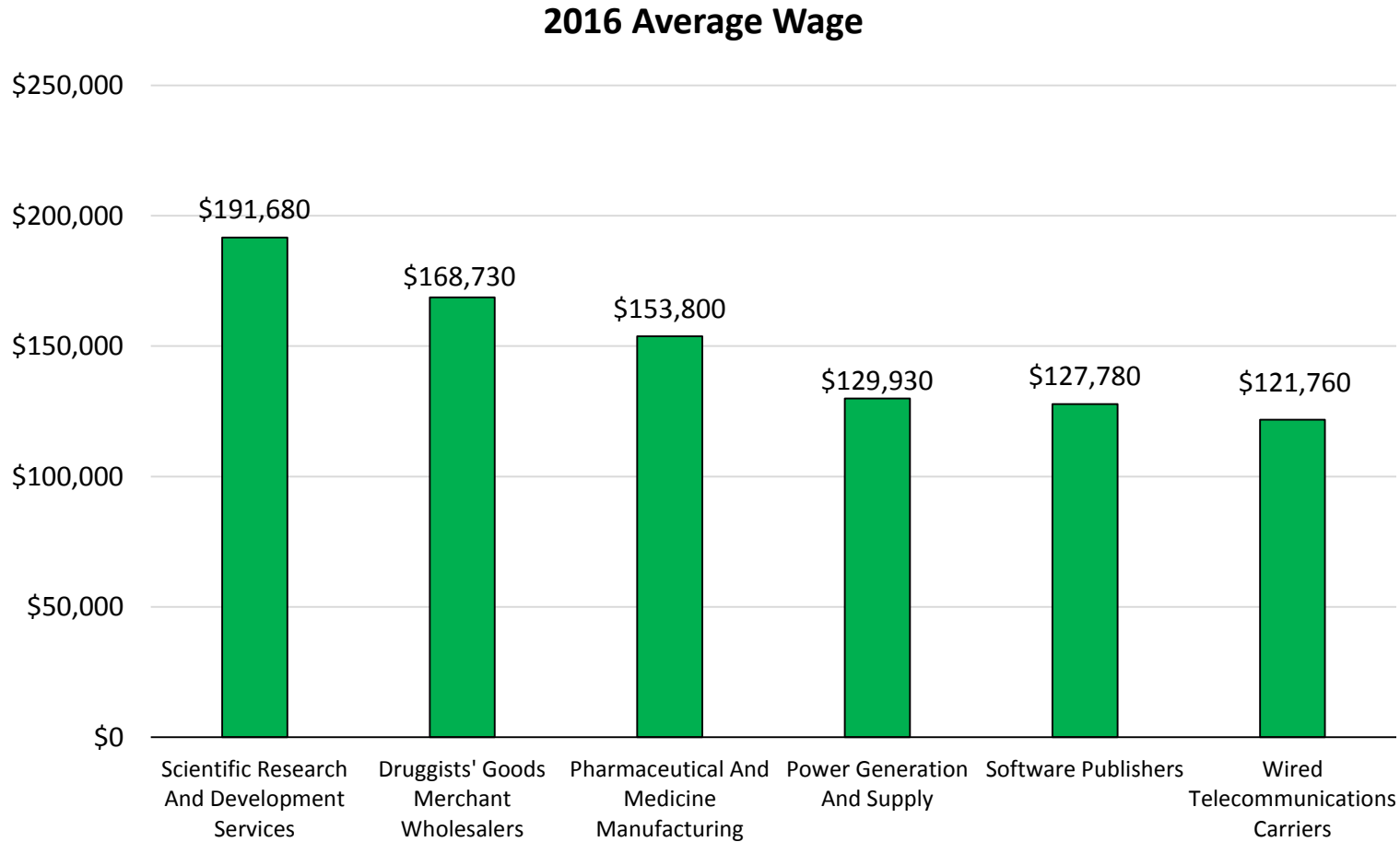Computer systems design and related services, Management and technical consulting services, and architectural and engineering services accounted for more than 70 percent of all establishments in the technology industry cluster in 2016.

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NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
TOP COMPONENT INDUSTRIES RANKED BY AVERAGE WAGE, 2016

2016 Average Wage

Industry	2016 Average Wage
Scientific Research And Development Services	$191,680
Druggists' Goods Merchant Wholesalers	$168,730
Pharmaceutical And Medicine Manufacturing	$153,800
Power Generation And Supply	$129,930
Software Publishers	$127,780
Wired Telecommunications Carriers	$121,760

The scientific research and development services industry has the 7th highest 2016 annual average wage across all industries in New Jersey.
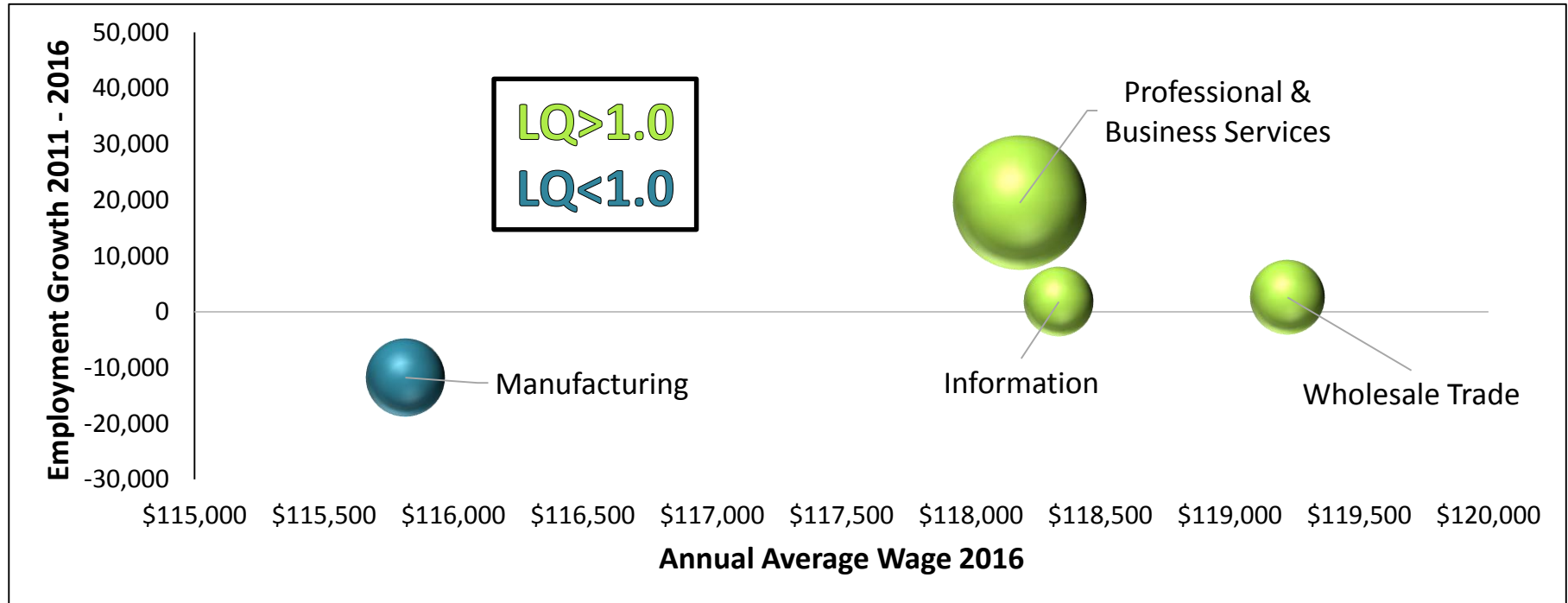
NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
EMPLOYMENT SIZE, GROWTH, SALARY & LOCATION QUOTIENT

Employment Growth 2011 - 2016 (Y-axis: -30,000 to 50,000)

LQ>1.0
LQ<1.0

Professional & Business Services

Manufacturing

Information

Wholesale Trade

Annual Average Wage 2016 (X-axis: $115,000 to $120,000)

The above bubble graph has four elements:

1. Total 2015 employment - represented by the size of the bubble.

2. 2010-2015 employment growth- shown on the Y-axis, or vertical position.

3. 2015 annual average wages - shown on the X-axis, or horizontal position.

4. Location quotient - indicated by the color of the bubble. The location quotient compares the concentration of the industry subsectors in the state to those of the nation. Industries with a location quotient above 1 are known as "basic industries" which (in theory) export a good or service from the state and in return, bring in wealth.

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
ALL PRIVATE SECTOR VS. TECHNOLOGY ANNUAL AVERAGE WAGE

Chart: Technology Cluster vs. All Industries, Annual Average Wage

Year	Technology Cluster	All Industries
2011	$103,980	$56,890
2012	$108,250	$58,090
2013	$110,950	$59,030
2014	$114,530	$60,150
2015	$118,430	$61,980
2016	$118,210	$62,420
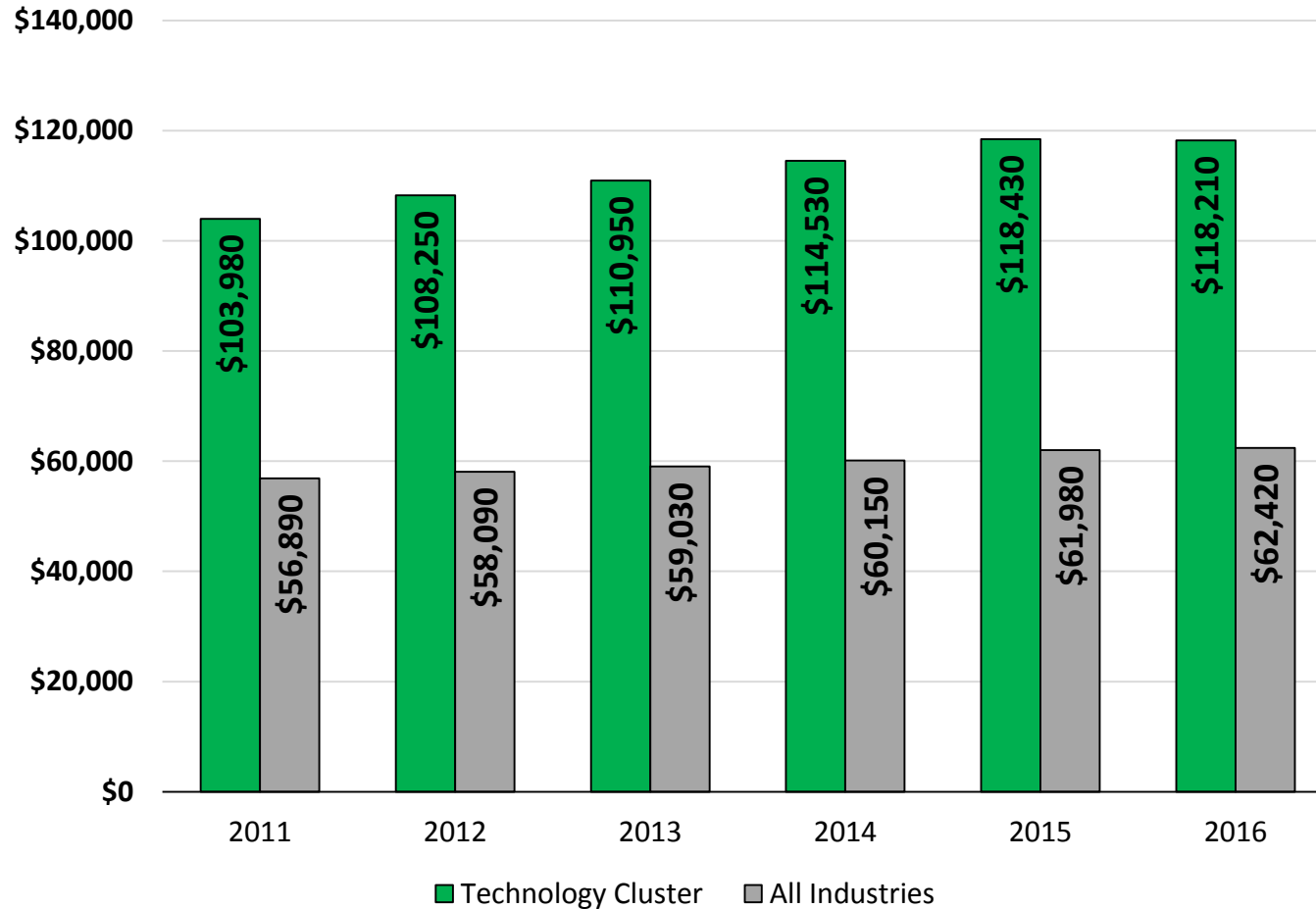
- Wages in the technology cluster have averaged 188% of the statewide annual average wage since 2011.

- Annual average wages for the technology cluster have risen +13.7% over the five year period from 2011 to 2016.

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NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
PROFESSIONAL, SCIENTIFIC & TECHNICAL SERVICES, 2016

NAICS and Industry Description	Units	Average Employment	Wages	
			Average	Total
Technology Industry Cluster	**27,550**	**366,330**	**$118,210**	**$43,303,459,650**
Professional, Scientific, and Technical Services Sector	**20,140**	**186,560**	**$118,190**	**$22,048,695,220**
Computer systems design & related services	9,140	72,890	$112,290	$8,184,740,070
Management & technical consulting services	6,800	45,860	$99,120	$4,544,864,130
Architectural & engineering services	3,400	37,370	$93,240	$3,484,684,020
Scientific research & development services	800	30,440	$191,680	$5,834,406,990

Employment in computer systems design and related services accounted for 19.9 percent of total technology cluster employment and 33.2 percent of its establishments.

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NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER MANUFACTURING SECTOR, 2016

NAICS and Industry Description	Units	Average Employment	Wages	
			Average	Total
Technology Industry Cluster	**27,550**	**366,330**	**$118,210**	**$43,303,459,650**
Manufacturing Sector	**1,530**	**63,960**	**$115,810**	**$7,407,120,460**
Pharmaceutical & Medicine	270	22,860	$153,800	$3,515,022,420
Electronic Instrument	320	12,480	$101,760	$1,269,556,030
Semiconductor & Electronic Component	200	7,250	$76,200	$552,315,750
Basic Chemical	120	6,110	$110,980	$678,451,090
Petroleum & Coal Products	70	3,030	$120,400	$364,990,060
Industrial Machinery	130	2,570	$73,140	$188,049,950
Communications Equipment	110	2,110	$117,320	$247,944,820
Electrical Equipment	70	1,790	$75,050	$134,221,910
Commercial & Service Industry Machinery	80	1,390	$70,800	$98,530,200
Aerospace Product & Parts	20	1,360	$82,170	$112,080,790
Computer & Peripheral Equipment	50	450	$108,700	$48,816,720

Pharmaceutical and medicine manufacturing led the manufacturing component in share of employment (35.7%) and wages (47.5%) in 2016.

Due to disclosure, totals may not be exact.

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NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER INFORMATION SECTOR, 2016

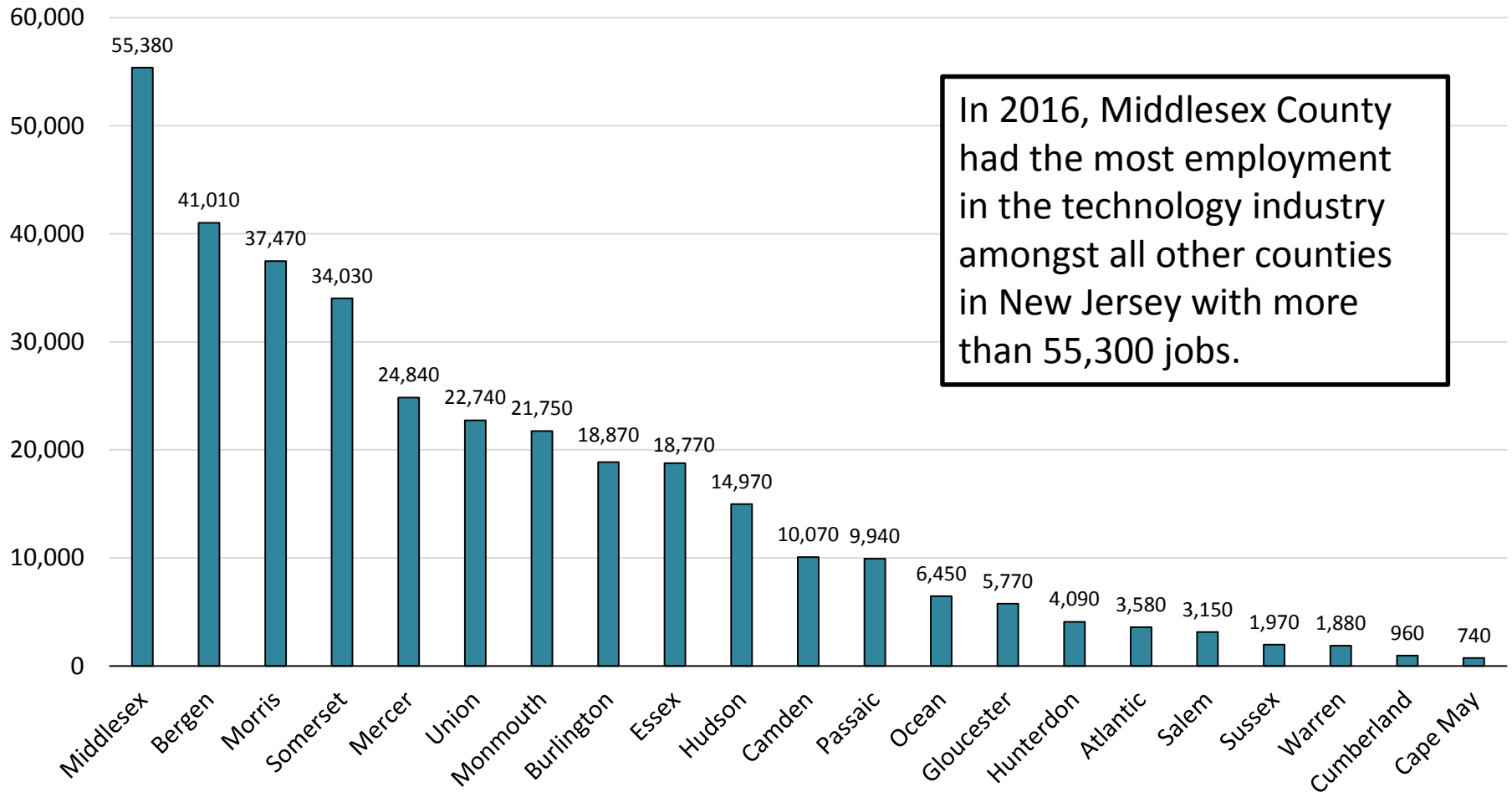| NAICS and Industry Description	Units	Average Employment	Wages	
			Average	Total
Technology Industry Cluster	**27,550**	**366,330**	**$118,210**	**$43,303,459,650**
Information Sector	**2,520**	**50,270**	**$118,340**	**$5,948,838,090**
Wired Telecommunications Carriers	450	23,920	$121,760	$2,912,002,520
Data Processing And Related Services	590	9,730	$117,640	$1,144,432,810
Software Publishers	510	5,930	$127,780	$757,770,390
Other Information Services	400	5,590	$119,580	$668,661,090
Other Telecommunications	290	2,820	$96,920	$273,287,870

Average wages paid for the information component were nearly equal to the technology industry cluster average in 2016 ($118,340 vs. $118,210).

Due to disclosure some industries were not included.

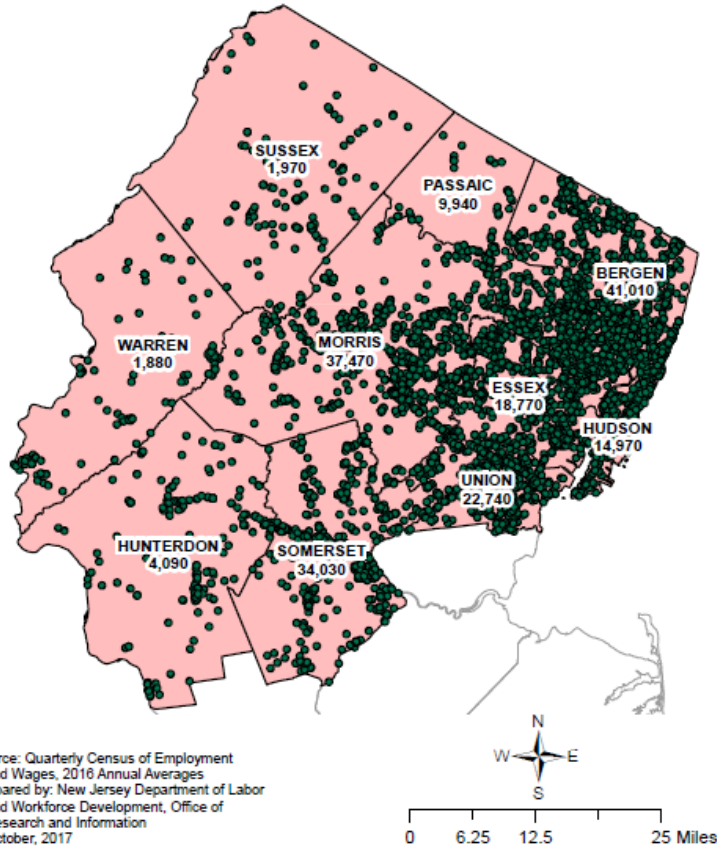# TECHNOLOGY INDUSTRY CLUSTER: REGIONAL AND COUNTY EMPLOYMENT ANALYSIS

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
TECHNOLOGY EMPLOYMENT BY COUNTY, 2016 ANNUAL AVERAGES

In 2016, Middlesex County had the most employment in the technology industry amongst all other counties in New Jersey with more than 55,300 jobs.

County	Employment
Middlesex	55,380
Bergen	41,010
Morris	37,470
Somerset	34,030
Mercer	24,840
Union	22,740
Monmouth	21,750
Burlington	18,870
Essex	18,770
Hudson	14,970
Camden	10,070
Passaic	9,940
Ocean	6,450
Gloucester	5,770
Hunterdon	4,090
Atlantic	3,580
Salem	3,150
Sussex	1,970
Warren	1,880
Cumberland	960
Cape May	740

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER NORTHERN REGION, 2016 ANNUAL AVERAGES

Technology Employment and Establishment Locations
Northern Region of New Jersey, 2016

SUSSEX 1,970
PASSAIC 9,940
BERGEN 41,010
WARREN 1,880
MORRIS 37,470
ESSEX 18,770
HUDSON 14,970
UNION 22,740
HUNTERDON 4,090
SOMERSET 34,030

Source: Quarterly Census of Employment
and Wages, 2016 Annual Averages
Prepared by: New Jersey Department of Labor
and Workforce Development, Office of
Research and Information
October, 2017

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Area	Establishments	Wages	
		Average	Total
Total NJ Technology	**27,550**	**$118,210**	**$43,303,459,650**
Northern Region	**11,240**	**$127,590**	**$23,840,012,540**
Bergen	2,940	$108,220	$4,437,921,060
Morris	2,000	$137,710	$5,160,183,480
Somerset	1,460	$142,460	$4,848,272,840
Essex	1,300	$101,890	$1,911,768,600
Hudson	1,060	$114,440	$1,712,678,360
Union	940	$176,970	$4,024,022,910
Passaic	690	$94,540	$939,600,350
Hunterdon	420	$119,070	$486,448,280
Sussex	260	$78,950	$155,299,650
Warren	180	$87,440	$163,817,020

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
CENTRAL REGION, 2016 ANNUAL AVERAGES

Technology Employment and Establishment Locations
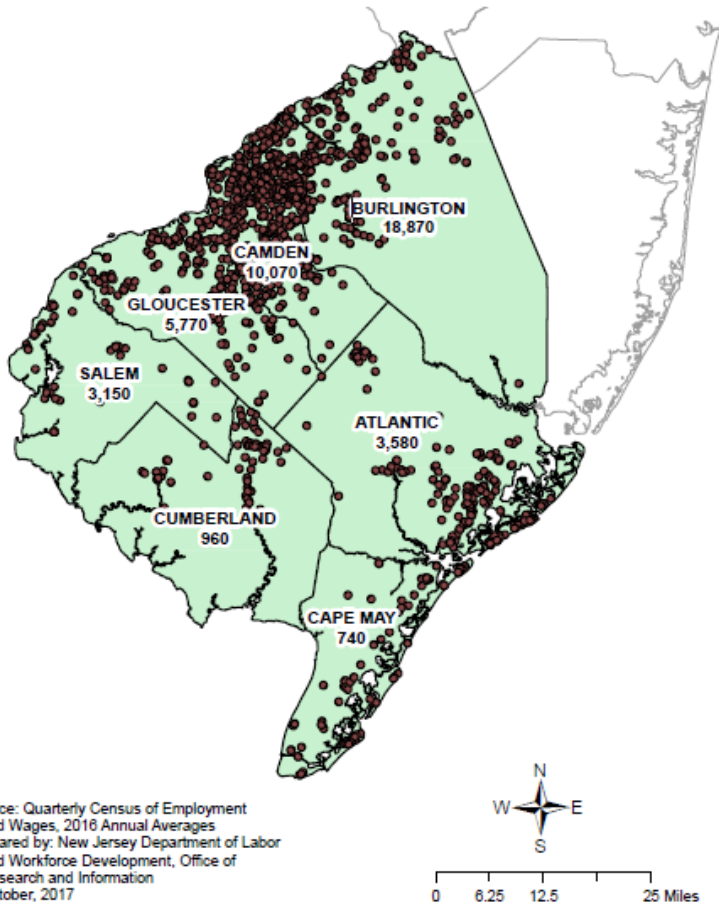**Central Region of New Jersey, 2016**

MIDDLESEX
55,380

MERCER
24,840

MONMOUTH
21,750

OCEAN
6,450

Source: Quarterly Census of Employment
and Wages, 2016 Annual Averages
Prepared by: New Jersey Department of Labor
and Workforce Development, Office of
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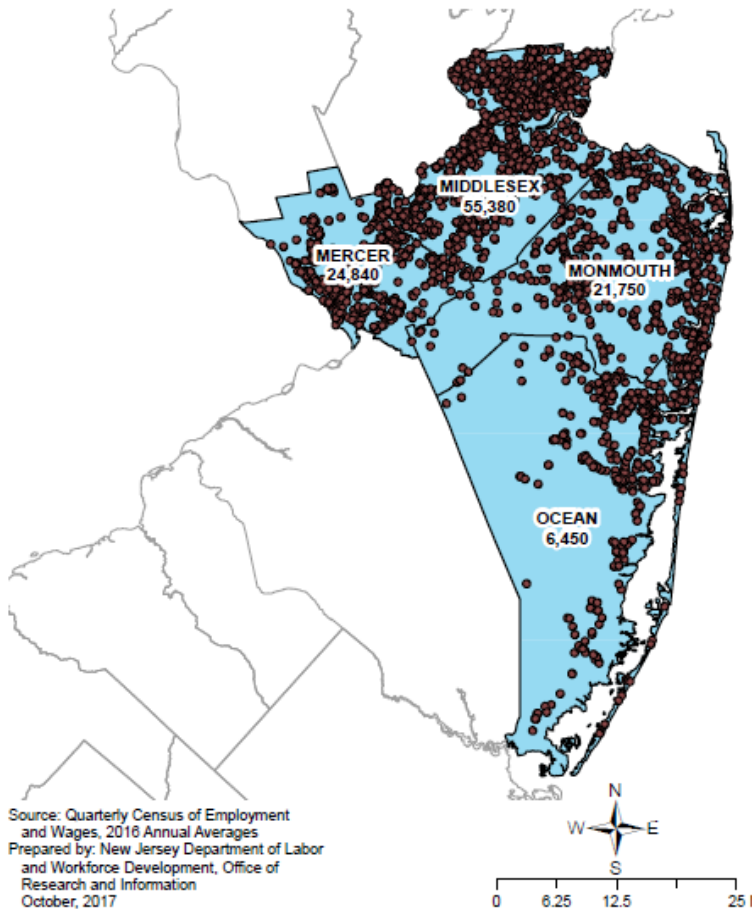
Area	Establishments	Wages	
		Average	**Total**
Total NJ Technology	**27,550**	**$118,210**	**$43,303,459,650**
Central Region	**7,470**	**$111,680**	**$12,108,568,570**
Middlesex	3,370	$108,080	$5,985,275,750
Monmouth	1,860	$102,840	$2,236,905,420
Mercer	1,590	$136,460	$3,389,180,610
Ocean	650	$77,070	$497,206,800

Source: NJ Department of Labor & Workforce
Development, Quarterly Census of Employment
and Wages

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER SOUTHERN REGION, 2016 ANNUAL AVERAGES

**Technology Employment and Establishment Locations
Southern Region of New Jersey, 2016**

Source: Quarterly Census of Employment
and Wages, 2016 Annual Averages
Prepared by: New Jersey Department of Labor
and Workforce Development, Office of
Research and Information
October, 2017

Area	Establishments	Wages	
		Average	**Total**
Total NJ Technology	**27,550**	**$118,210**	**$43,303,459,650**
Southern Region	**2,810**	**$87,120**	**$3,757,630,790**
Burlington	1,050	$92,580	$1,746,924,370
Camden	780	$79,600	$801,161,710
Gloucester	410	$77,920	$449,733,870
Atlantic	310	$81,970	$293,102,910
Cape May	110	$71,300	$52,428,360
Cumberland	100	$63,750	$61,157,960
Salem	60	$112,040	$353,121,620

TECHNOLOGY INDUSTRY CLUSTER: OCCUPATIONAL ANALYSIS

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
TOP OCCUPATIONAL GROUPS, 2016

Occupational Title	2016 Employment	Percent of Total Employment	2016 Average Salary
All Technology Occupations	**365,050**	**100%**	**$78,860**
Computer and Mathematical Occupations	79,280	**21.7%**	$95,380
Office and Administrative Support Occupations	49,440	**13.5%**	$47,080
Management Occupations	46,410	**12.7%**	$160,950
Business and Financial Operations Occupations	37,350	**10.2%**	$82,200
Architecture and Engineering Occupations	30,470	**8.3%**	$92,530
Sales and Related Occupations	29,110	**8.0%**	$84,000
Production Occupations	28,960	**7.9%**	$45,870
Life, Physical, and Social Science Occupations	20,380	**5.6%**	$86,100
Installation, Maintenance, and Repair Occupations	15,790	**4.3%**	$61,220
Science, Technology, Engineering, and Mathematical (STEM) Occupations	**130,130**	**35.6%**	**$91,340**

Science, Technology, Engineering and Mathematical (STEM) occupations accounted for more than 1/3 of the technology cluster occupational employment in 2016 with 130,130 employment.
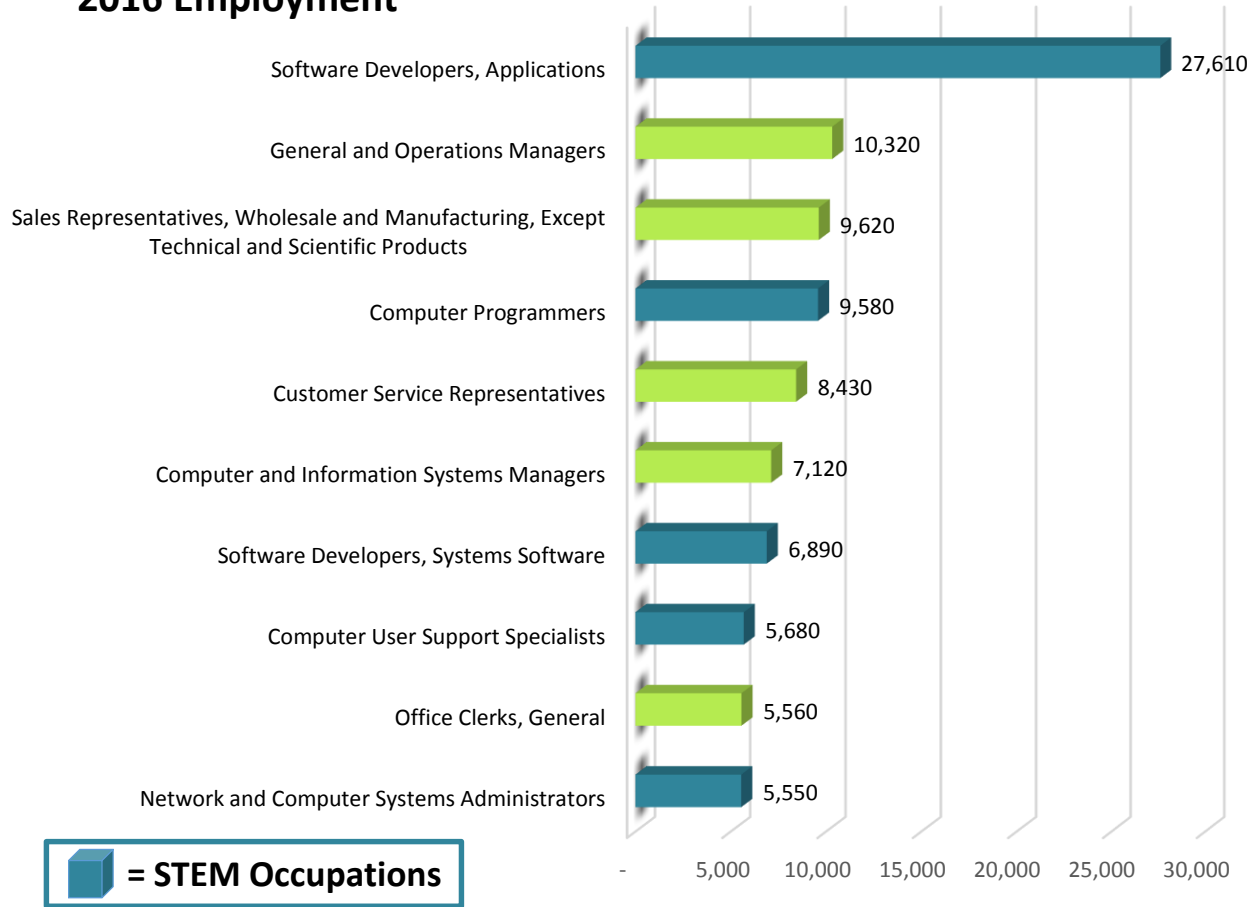
NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
INDUSTRY CLUSTER TOP 20 OCCUPATIONS BY EMPLOYMENT, 2016

New Jersey Technology Cluster's Top 20 Occupations

NAICS and Occupational Title	2016 Employment	Education
15-1132 Software Developers, Applications	27,610	Bachelor's degree
11-1021 General and Operations Managers	10,320	Bachelor's degree
41-4012 Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	9,620	High school diploma or equivalent
15-1131 Computer Programmers	9,580	Bachelor's degree
43-4051 Customer Service Representatives	8,430	High school diploma or equivalent
11-3021 Computer and Information Systems Managers	7,120	Bachelor's degree
15-1133 Software Developers, Systems Software	6,890	Bachelor's degree
15-1151 Computer User Support Specialists	5,680	Some college, no degree
43-9061 Office Clerks, General	5,560	High school diploma or equivalent
15-1142 Network and Computer Systems Administrators	5,550	Bachelor's degree
19-2031 Chemists	4,930	Bachelor's degree
43-6014 Secretaries and Administrative Assistants, Except Legal, Medical,	4,630	High school diploma or equivalent
13-1111 Management Analysts	4,560	Bachelor's degree
43-3031 Bookkeeping, Accounting, and Auditing Clerks	4,460	Some college, no degree
13-1161 Market Research Analysts and Marketing Specialists	4,410	Bachelor's degree
17-2051 Civil Engineers	4,380	Bachelor's degree
15-1121 Computer Systems Analysts	4,170	Bachelor's degree
53-7062 Laborers and Freight, Stock, and Material Movers, Hand	3,910	No formal educational credential
13-2011 Accountants and Auditors	3,790	Bachelor's degree
15-1143 Computer Network Architects	3,720	Bachelor's degree

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER TOP TEN TECHNOLOGY OCCUPATIONS, 2016

2016 Employment

| Occupation	Employment
Software Developers, Applications	27,610
General and Operations Managers	10,320
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	9,620
Computer Programmers	9,580
Customer Service Representatives	8,430
Computer and Information Systems Managers	7,120
Software Developers, Systems Software	6,890
Computer User Support Specialists	5,680
Office Clerks, General	5,560
Network and Computer Systems Administrators	5,550

◼ = STEM Occupations

- Nine of the top twenty occupations are science, technology, engineering and math occupations and make-up 19.9 percent of total cluster occupational employment.

- The top twenty technology cluster occupations accounted for 38.2% percent of total technology cluster occupational employment in 2016.

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Source: NJ Department of Labor & Workforce Development, Occupational Employment Statistics Survey

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
ALL STEM OCCUPATIONS BY LABOR AREA

Employment by Labor Area
STEM Occupations in New Jersey, 2016
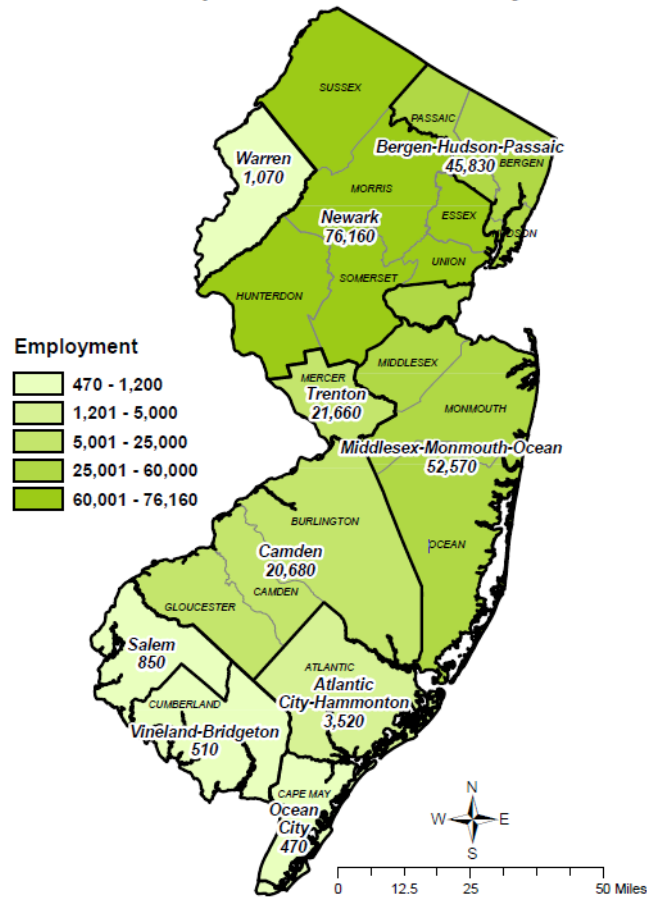
Labor Area	STEM Employment
Essex-Hudson-Morris-Somerset-Sussex-Union County Area	76,160
Middlesex-Monmouth-Ocean County Area	52,570
Bergen-Hudson-Passic County Area	45,830
Mercer County Area	21,660
Burlington-Camden-Gloucester County Area	20,680
Atlantic County Area	3,520
Warren County Area	1,070
Salem County Area	850
Cumberland County Area	510
Cape May County Area	470

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
LARGEST STEM OCCUPATIONS BY EMPLOYMENT, 2016

Occupation	2016 Employment
Software Developers, Applications	27,610
Computer Programmers	9,580
Software Developers, Systems Software	6,890
Computer User Support Specialists	5,680
Network and Computer Systems Administrators	5,550
Chemists	4,930
Civil Engineers	4,380
Computer Systems Analysts	4,170
Computer Network Architects	3,720
Chemical Technicians	3,340

2016 Employment

Chart x-axis: 0   10,000   20,000   30,000

- The top five STEM occupations are related to computers.

- Applications software developers accounted for 7.6 percent of employment in the technology industry cluster in 2016.

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NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
ANNUAL AVERAGE SALARY FOR LARGEST STEM OCCUPATIONS, 2016

2016 Annual Average Salary

Occupation	2016 Annual Average Salary
Computer Network Architects	$120,790
Software Developers, Systems Software	$113,160
Software Developers, Applications	$106,120
Civil Engineers	$99,870
Computer Systems Analysts	$98,660
Computer Programmers	$90,170
Network and Computer Systems Administrators	$87,990
Chemists	$84,610
Computer User Support Specialists	$61,530
Chemical Technicians	$57,290

- The highest annual average salary for STEM occupations in 2016 was physicists, but had less than 250 employment ($181,090).

- The top twenty STEM occupations by employment all had an occupational annual average wage that was above the state ($ 52,480).
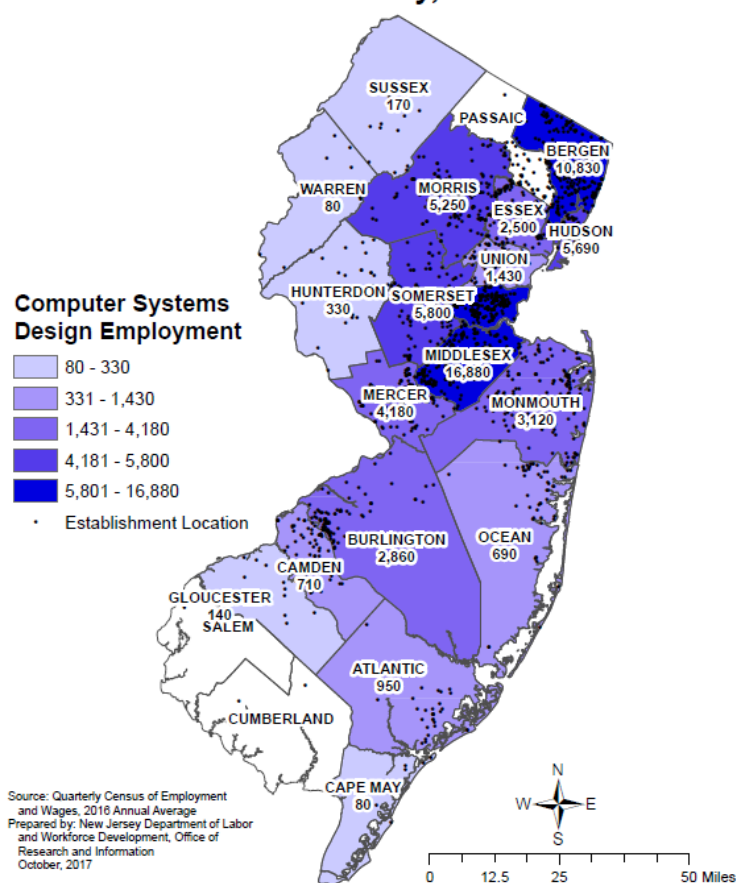
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TECHNOLOGY INDUSTRY CLUSTER: SUB-SECTOR ANALYSIS

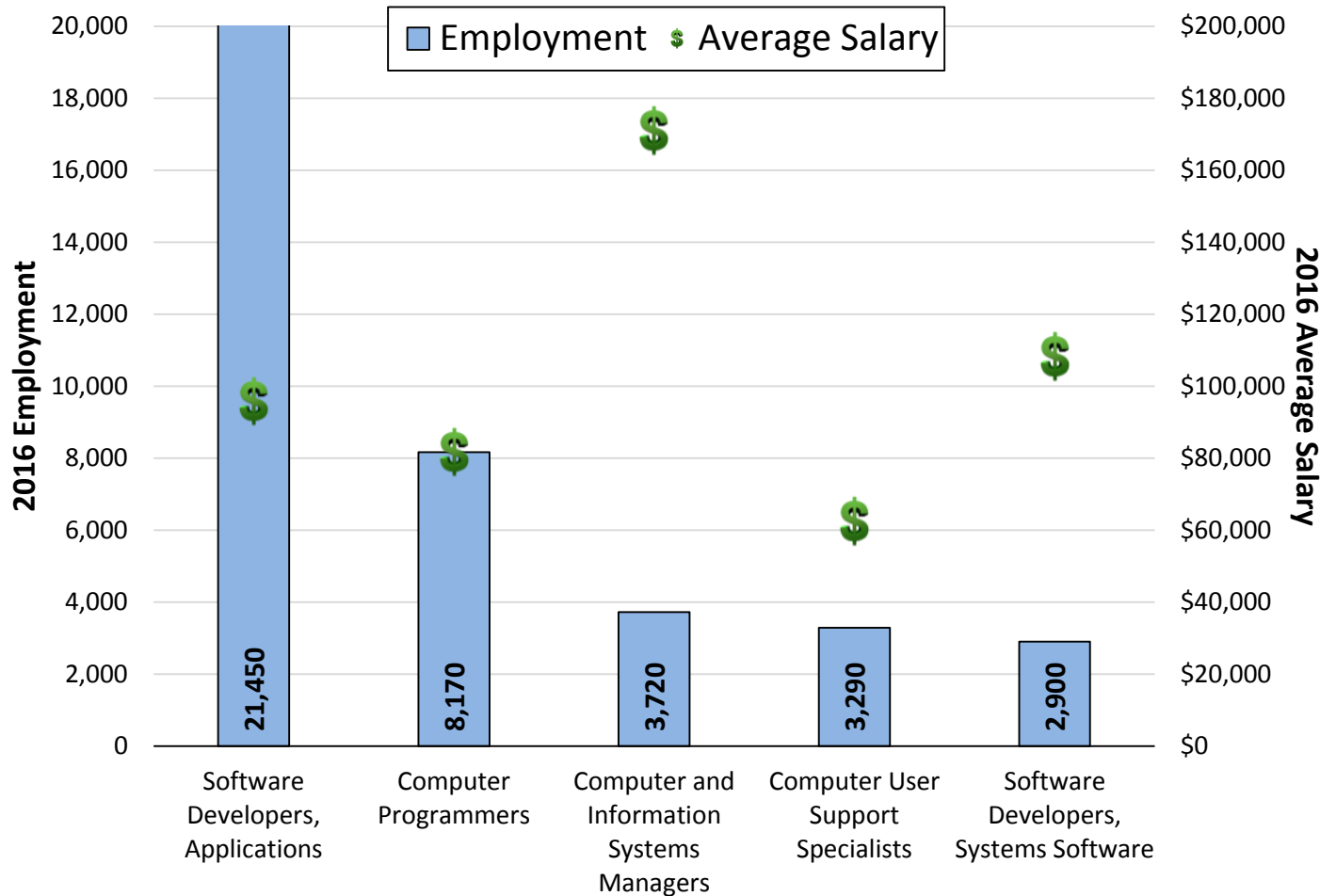# NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER COMPUTER SYSTEMS DESIGN AND RELATED SERVICES, 2016

- Provide expertise in the field of information technologies, including software development, planning and development of computer systems and managing onsite computer systems for clients.

- Accounted for nearly one-third of all technology industry cluster establishments in NJ (9,140) in 2016.

- From 2011 to 2016 employment has grown 14.5 percent to 72,890 employment in 2016.

- Over $8.1 billion dollars paid in total wages, making up nearly twenty percent of total technology industry cluster wages paid in 2016.

Computer Systems Design Employment and Establishment Locations New Jersey, 2016

SUSSEX 170
PASSAIC
BERGEN 10,830
WARREN 80
MORRIS 5,250
ESSEX 2,500
HUDSON 5,690
UNION 1,430
HUNTERDON 330
SOMERSET 5,800
MIDDLESEX 16,880
MERCER 4,180
MONMOUTH 3,120
BURLINGTON 2,860
OCEAN 690
CAMDEN 710
GLOUCESTER 140
SALEM
ATLANTIC 950
CUMBERLAND
CAPE MAY 80

Computer Systems Design Employment
- 80 - 330
- 331 - 1,430
- 1,431 - 4,180
- 4,181 - 5,800
- 5,801 - 16,880

· Establishment Location

Source: Quarterly Census of Employment and Wages, 2016 Annual Average
Prepared by: New Jersey Department of Labor and Workforce Development, Office of Research and Information
October, 2017

0   12.5   25   50 Miles

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
COMPUTER SYSTEMS DESIGN AND RELATED SERVICES

Legend: ☐ Employment $ Average Salary

Chart — 2016 Employment (left axis, 0 to 20,000) and 2016 Average Salary (right axis, $0 to $200,000):

Occupation	2016 Employment
Software Developers, Applications	21,450
Computer Programmers	8,170
Computer and Information Systems Managers	3,720
Computer User Support Specialists	3,290
Software Developers, Systems Software	2,900

- The top ten occupations in the computer systems design & related services industry make up 64.8 percent.

- The average salary in Computer Systems Design and Related Services ($98,630) is 109.4 percent of the technology cluster average.
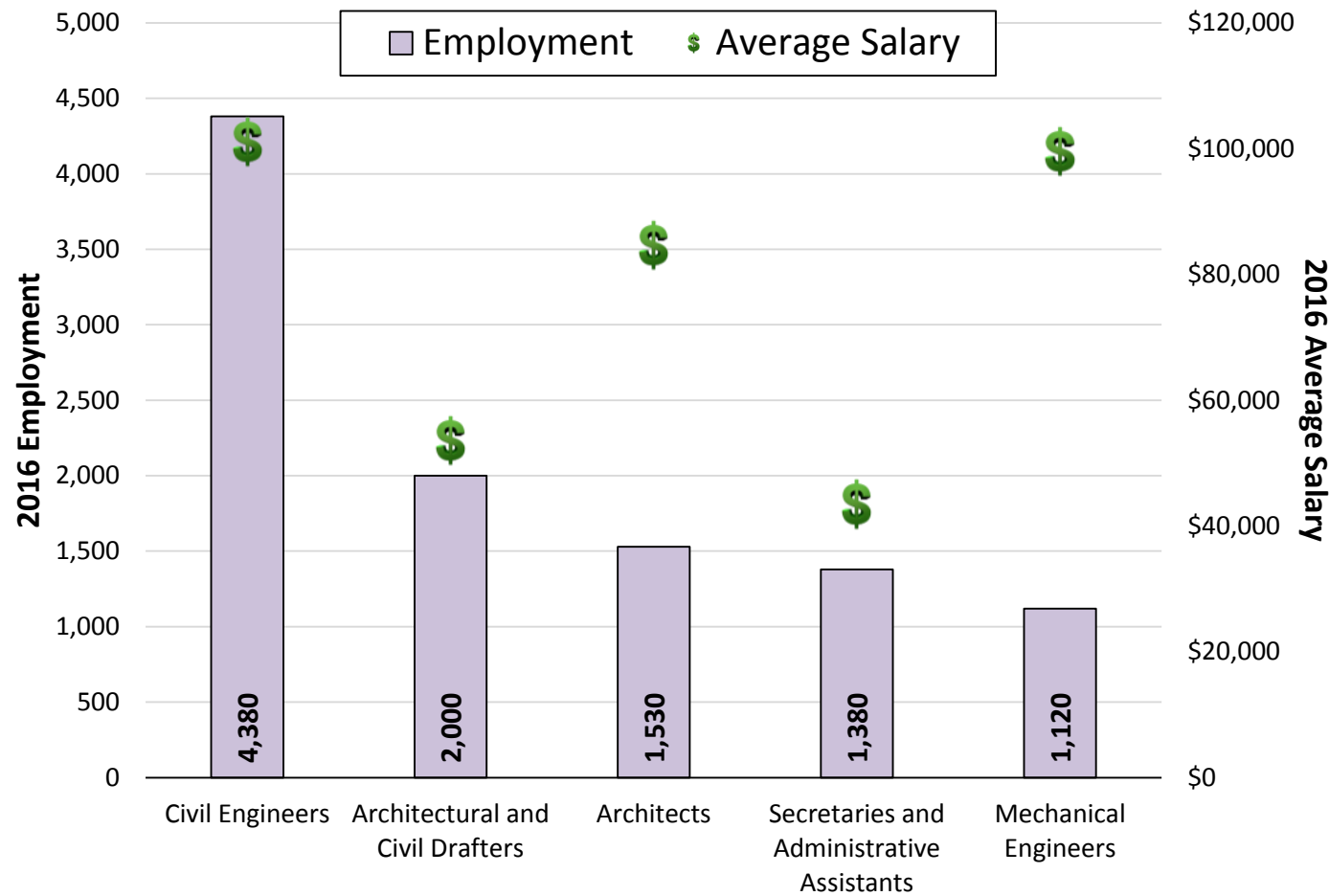
NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER ARCHITECTURAL AND ENGINEERING SERVICES, 2016

- Architectural and Engineering Services industry is distributed fairly evenly from Camden and Burlington counties in the southern part of the state through the central counties up through the northeast.

- Accounted for 10.2 percent of all technology industry cluster employment in NJ (37,370) in 2016.

- There are 3,400 establishments throughout NJ, with the most in Bergen County (390).

- Over $3.4 billion dollars paid in total wages, making up over eight percent of total technology industry cluster wages paid in 2016.

Architectural and Engineering Employment and Establishment Locations New Jersey, 2016

Architectural & Engineering Employment
- 40 - 460
- 461 - 1,180
- 1,181 - 1,890
- 1,891 - 3,190
- 3,191 - 4,800
- Establishment Location

SUSSEX 270
PASSAIC 1,180
BERGEN 3,970
WARREN 260
MORRIS 3,760
ESSEX 2,740
HUDSON 820
UNION 1,390
HUNTERDON 1,020
SOMERSET 2,220
MIDDLESEX 4,800
MERCER 3,190
MONMOUTH 2,750
BURLINGTON 2,750
OCEAN 1,340
CAMDEN 1,890
GLOUCESTER 460
SALEM 40
ATLANTIC 790
CUMBERLAND 150
CAPE MAY 190

Source: Quarterly Census of Employment and Wages, 2016 Annual Average
Prepared by: New Jersey Department of Labor and Workforce Development, Office of Research and Information
October, 2017

0   12.5   25   50 Miles

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
ARCHITECTURAL, ENGINEERING & RELATED SERVICES

Chart — 2016 Employment and Average Salary:
- Civil Engineers: Employment 4,380; Average Salary ~$105,000
- Architectural and Civil Drafters: Employment 2,000; Average Salary ~$53,000
- Architects: Employment 1,530; Average Salary ~$85,000
- Secretaries and Administrative Assistants: Employment 1,380; Average Salary ~$43,000
- Mechanical Engineers: Employment 1,120; Average Salary ~$100,000

Legend: ☐ Employment $ Average Salary

- Civil Engineers accounted for 11.8 percent of employment in the architectural, engineering and related services industry.

- The average salary for architectural, engineering, and related services ($82,742) is higher than the total technology industry average.

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NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER MANAGEMENT AND TECHNICAL CONSULTING SERVICES, 2016

- Management and technical consulting services employment (45,860) made up 12.5 percent of the technology industry cluster.

- The average wage for this industry is much lower than the technology industry cluster average ($99,120 vs. $118,210).

- Establishments for this cluster accounted for nearly one quarter of total technology industry cluster establishments throughout NJ (6,800).

- More than $4.5 billion dollars paid in total wages, making up near 10.5 percent of all wages paid for the technology industry cluster in 2016.

Management and Technical Consulting Employment and Establishment Locations New Jersey, 2016

SUSSEX 290
PASSAIC 960
BERGEN 5,040
WARREN 130
MORRIS 6,430
ESSEX 1,830
HUDSON 2,620
UNION 2,550
HUNTERDON 490
SOMERSET 4,460
MIDDLESEX 3,670
MERCER 3,090
MONMOUTH 3,000
BURLINGTON 1,640
OCEAN 1,150
CAMDEN 1,940
GLOUCESTER 580
SALEM
ATLANTIC 460
CUMBERLAND
CAPE MAY 100

Management and Technical Consulting Employment

- 100 - 580
- 581 - 1,150
- 1,151 - 1,940
- 1,941 - 3,670
- 3,671 - 6,430
- Establishment Location

Source: Quarterly Census of Employment and Wages, 2016 Annual Average
Prepared by: New Jersey Department of Labor and Workforce Development, Office of Research and Information
October, 2017

0   12.5   25   50 Miles

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NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER MANAGEMENT, SCIENTIFIC & TECHNICAL CONSULTING SERVICES

Chart: 2016 Employment and 2016 Average Salary

Legend: ■ Employment $ Average Salary

Occupation	2016 Employment
General and Operations Managers	2,910
Management Analysts	2,680
Software Developers, Applications	1,620
Customer Service Representatives	1,530
Market Research Analysts and Marketing Specialists	1,430
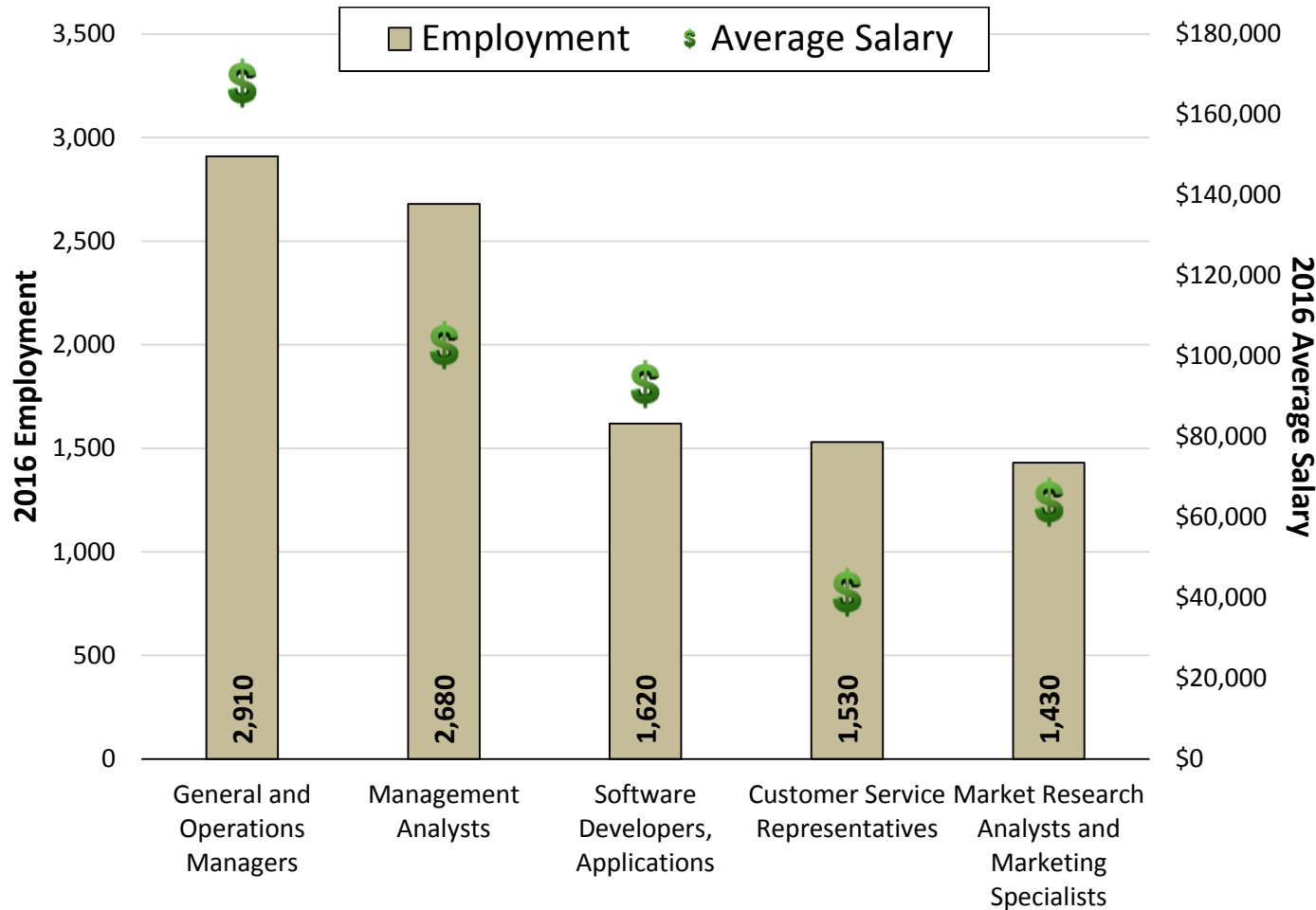
- Accounts for 12.1 percent of the technology industry cluster employment.

- Average salary for the management, scientific, and technical consulting services industry ($85,604) is higher than the technology industry cluster average.

Source: NJ Department of Labor & Workforce Development, Occupational Employment Statistics Survey

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER MANUFACTURING, 2016

- The state's high technology manufacturing sector is led by the pharmaceutical and medicine manufacturing, and medical device manufacturing industries.

- Average wage is lower than the total technology industry cluster average ($115,810 vs. $118,210).

- Manufacturing accounted for 17.5 percent of all technology industry cluster employment (63,670).

- More than $7.4 billion dollars paid in total wages, making up 17.1 percent of all wages paid for the technology industry cluster in 2016.

Manufacturing Employment and Establishment Locations
New Jersey, 2016

Manufacturing Employment
- 100 - 740
- 741 - 2,650
- 2,651 - 3,730
- 3,731 - 7,110
- 7,111 - 9,690
- Establishment Location

SUSSEX 740
PASSAIC 3,730
BERGEN 6,110
WARREN
MORRIS 7,110
ESSEX 3,140
HUDSON
HUNTERDON
UNION 6,050
SOMERSET 6,370
MIDDLESEX 9,690
MERCER 3,360
MONMOUTH 2,650
BURLINGTON 5,430
OCEAN
CAMDEN 2,630
GLOUCES 2,255
SALEM
ATLANTIC 410
CUMBERLAND 200
CAPE MAY 100

Source: Quarterly Census of Employment and Wages, 2016 Annual Average
Prepared by: New Jersey Department of Labor and Workforce Development, Office of Research and Information
October, 2017

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER MANUFACTURING, 2016

- Pharmaceutical manufacturing industry accounted for 6.1 percent of the technology industry cluster employment.

- Pharmaceutical manufacturing industry average salary ($77,845) falls below the technology industry cluster average.

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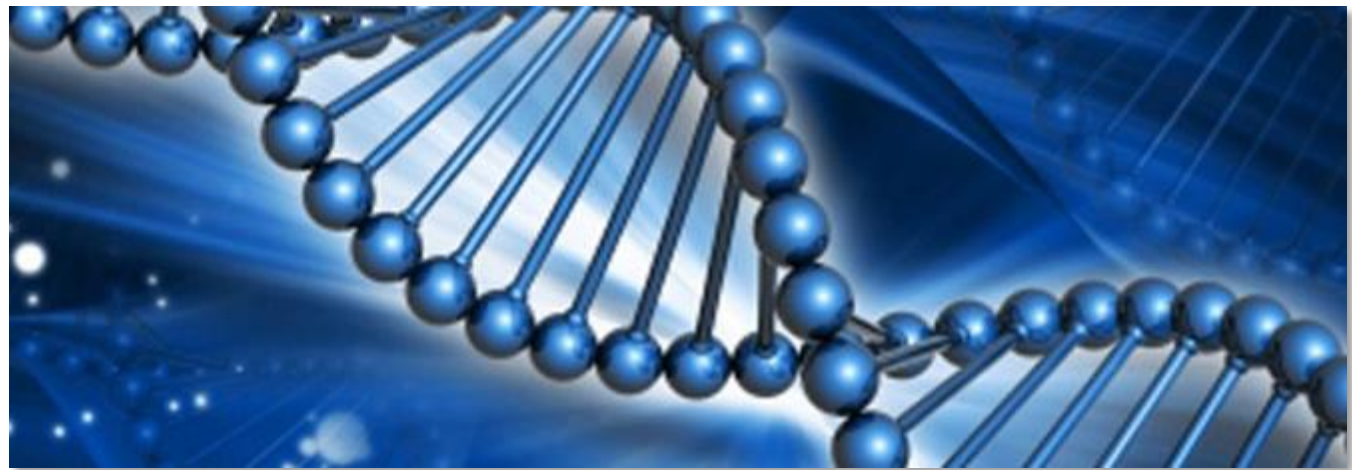
NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
NJ RESIDENTS IN TECHNOLOGY WORK FORCE VS. TOTAL NONFARM

**Age Breakdown of Workers in Technology and All Industries
New Jersey, 2016**

Technology   All Industries
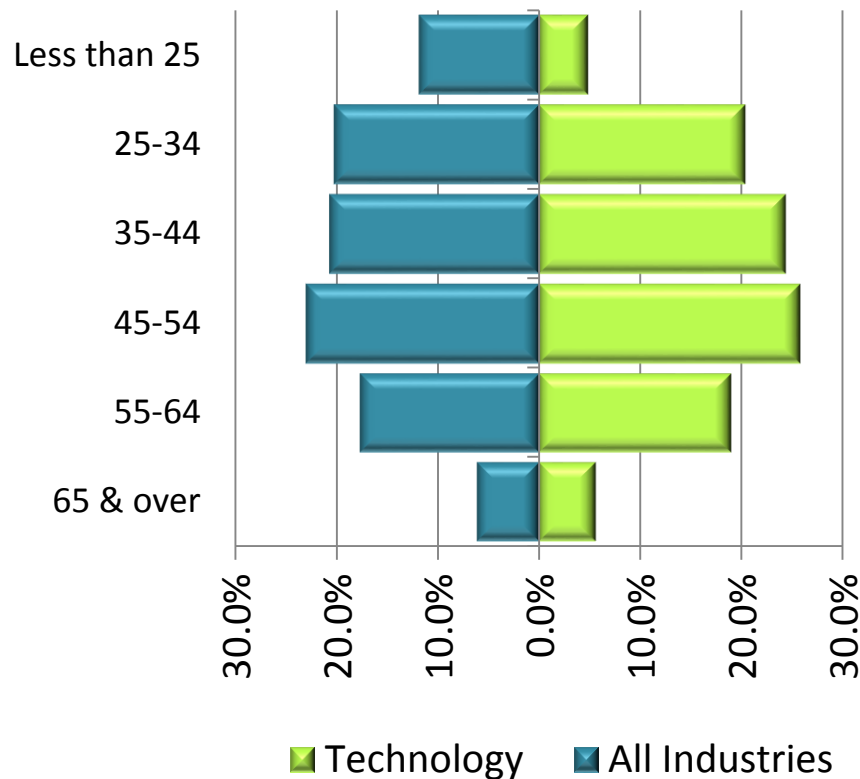
- The workforce of the technology industry has seen a slight shift with 49.6 percent aged 44 and under, compared to 2015 in which 45 and up held about 49.7 percent.

- The largest disparity among age cohorts occurs in the youngest group, where only 4.9 percent of the technology workforce is 25 years old or younger, but has not increased/decreased since 2015.

- 5.6 percent of the current NJ resident technology workforce is aged 65 and older, increasing .6 percent from 2015.

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NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
NJ RESIDENTS IN TECHNOLOGY WORK FORCE VS. TOTAL NONFARM

Technology

Female 34%
Male 66%
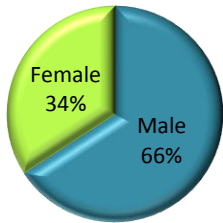
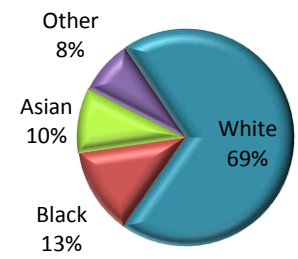**All Industries**

Female 47%
Male 53%

Males continue to outnumber females by nearly a 2 to 1 margin in the technology workforce.

NJ residents who are Asian (20.3%) hold the 2nd highest percentile in the technology industry.
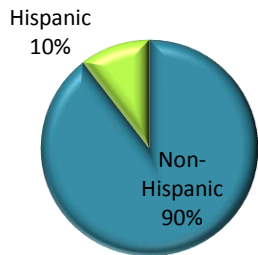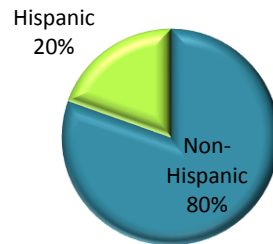
Technology

Other 4.8%
Asian 20.3%
White 67.7%
Black 7.1%

All Industries

Other 8%
Asian 10%
White 69%
Black 13%

Technology

Hispanic 10%
Non-Hispanic 90%

All Industries
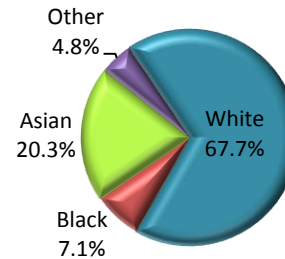
Hispanic 20%
Non-Hispanic 80%

The technology workforce has seen a .2% decrease in Hispanics presence since 2015.

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
NJ RESIDENTS IN TECHNOLOGY WORK FORCE

Education Level
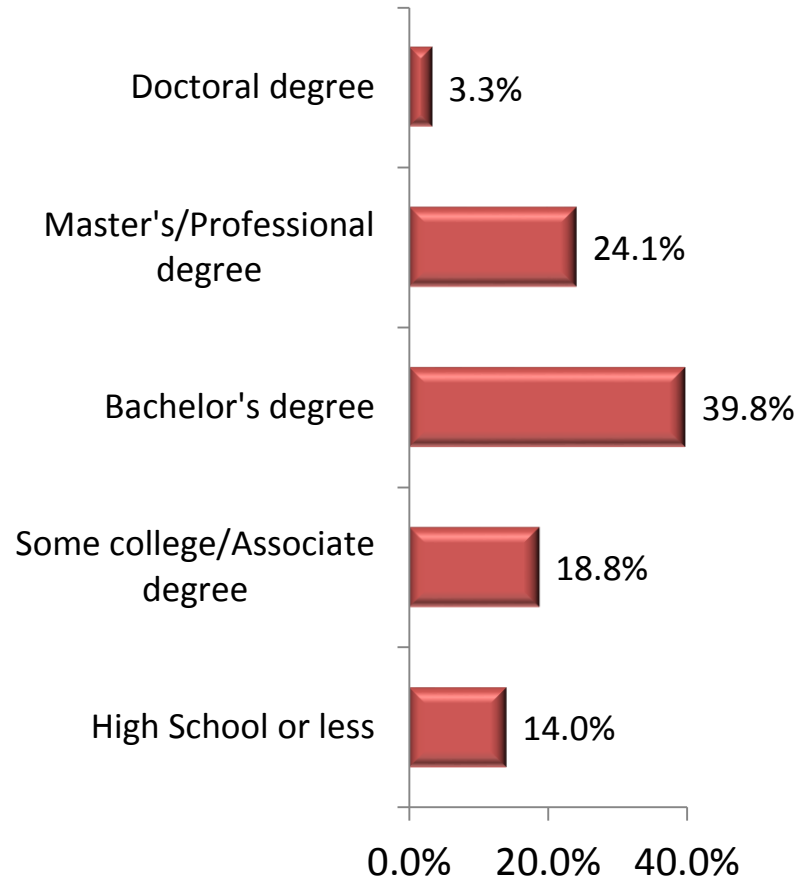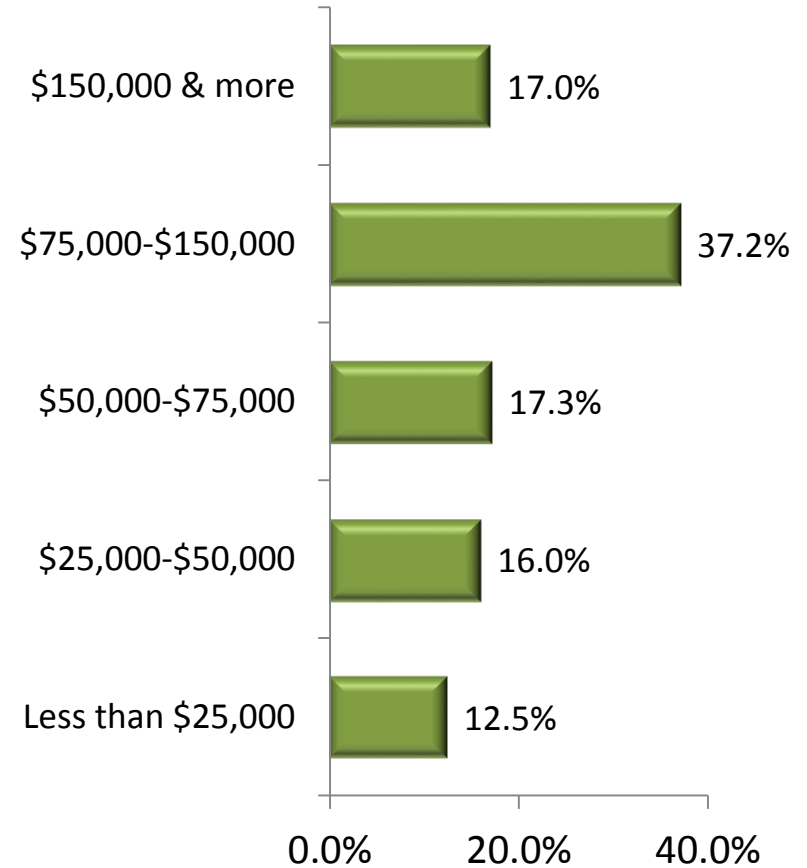
Doctoral degree	3.3%
Master's/Professional degree	24.1%
Bachelor's degree	39.8%
Some college/Associate degree	18.8%
High School or less	14.0%

0.0%   20.0%   40.0%

Personal Earnings

$150,000 & more	17.0%
$75,000-$150,000	37.2%
$50,000-$75,000	17.3%
$25,000-$50,000	16.0%
Less than $25,000	12.5%

0.0%   20.0%   40.0%

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
NJ RESIDENTS IN STEM JOBS

Occupation	Total Employment	Male		Female	
		Number	Percent	Number	Percent
STEM total	*327,100*	*245,100*	*74.9%*	*82,100*	*25.1%*
Computer Science & Math	180,800	135,300	74.8%	45,500	25.2%
Engineering & Surveying	65,000	58,000	89.2%	7,000	10.8%
Physical & Life Science	42,700	21,900	51.3%	20,800	48.7%
STEM Managers	38,600	29,800	77.2%	8,800	22.8%

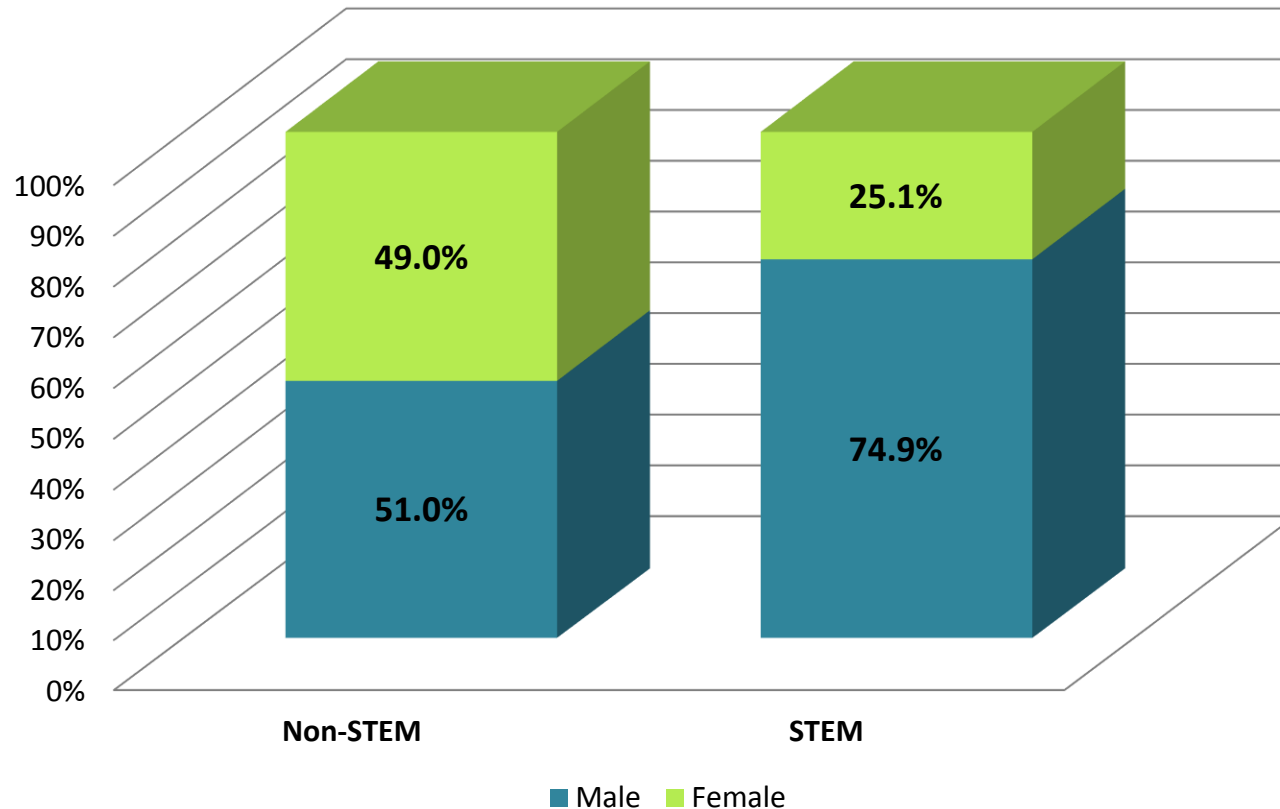*Note: Estimates are for employed persons 16 and over.*

- The highest percentage of women is found in physical and life science occupations for NJ residents (48.7%).

- 77.2 percent of NJ residents that are managers for STEM occupations are male, up .2% from the previous year.

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NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
NJ RESIDENTS IN STEM JOBS

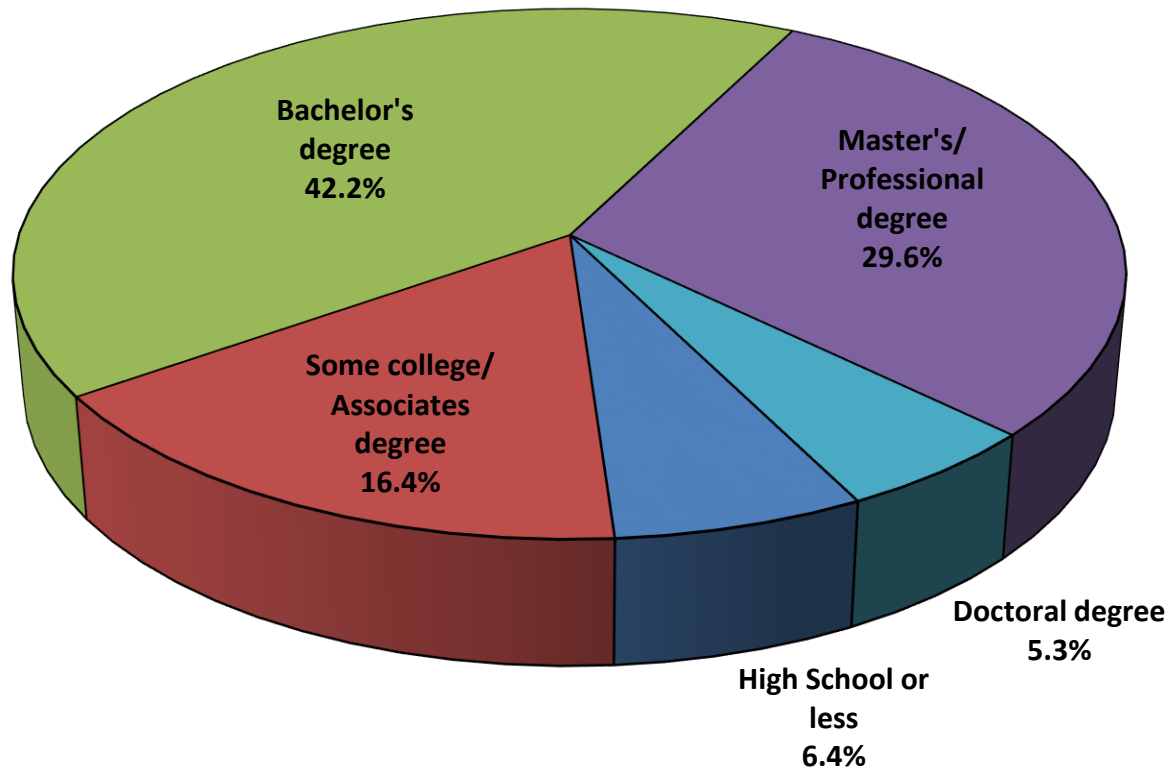## Gender Shares of Non-STEM and STEM Jobs, 2016

The STEM workforce is predominantly male driven. Resident women hold slightly over twenty-five percent of science, technology, engineering & math jobs in New Jersey.

Non-STEM: Female 49.0%, Male 51.0%
STEM: Female 25.1%, Male 74.9%

■ Male ■ Female

Note: Estimates are for employed persons 16 and over.

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NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
EDUCATION CHARACTERISTICS FOR NJ RESIDENTS IN STEM JOBS

Educational Breakdown

- Bachelor's degree 42.2%
- Master's/Professional degree 29.6%
- Some college/Associates degree 16.4%
- High School or less 6.4%
- Doctoral degree 5.3%

- The STEM workforce requires well-educated and highly skilled workers to meet the high level and technical demands of many of the occupations they fill.

- More than ¾ of NJ residents in the STEM workforce hold at least a Bachelor's degree compared to only 38.7% percent of NJ residents in non-stem occupations.
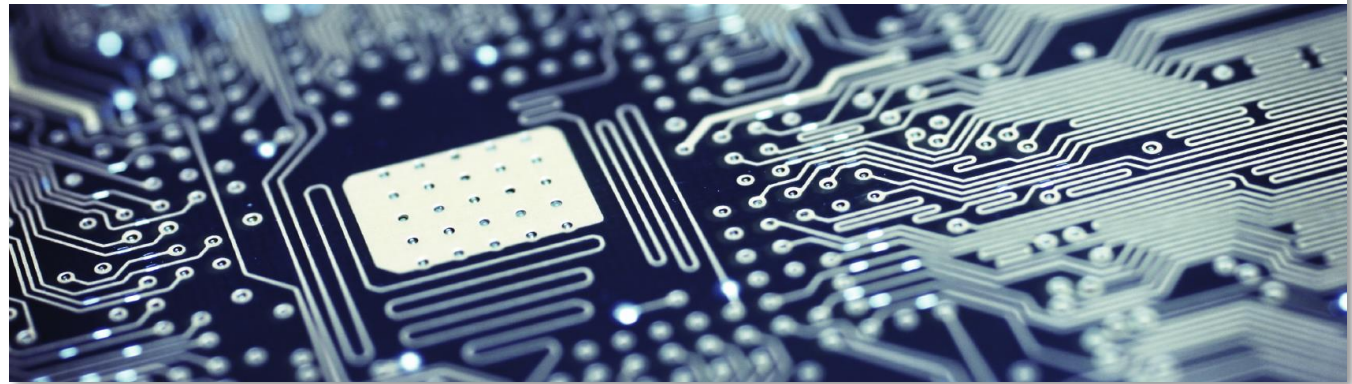
Note: Estimates are for employed persons 16 and over.

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TECHNOLOGY INDUSTRY CLUSTER: OCCUPATIONAL PROJECTIONS AND OUTLOOK

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER
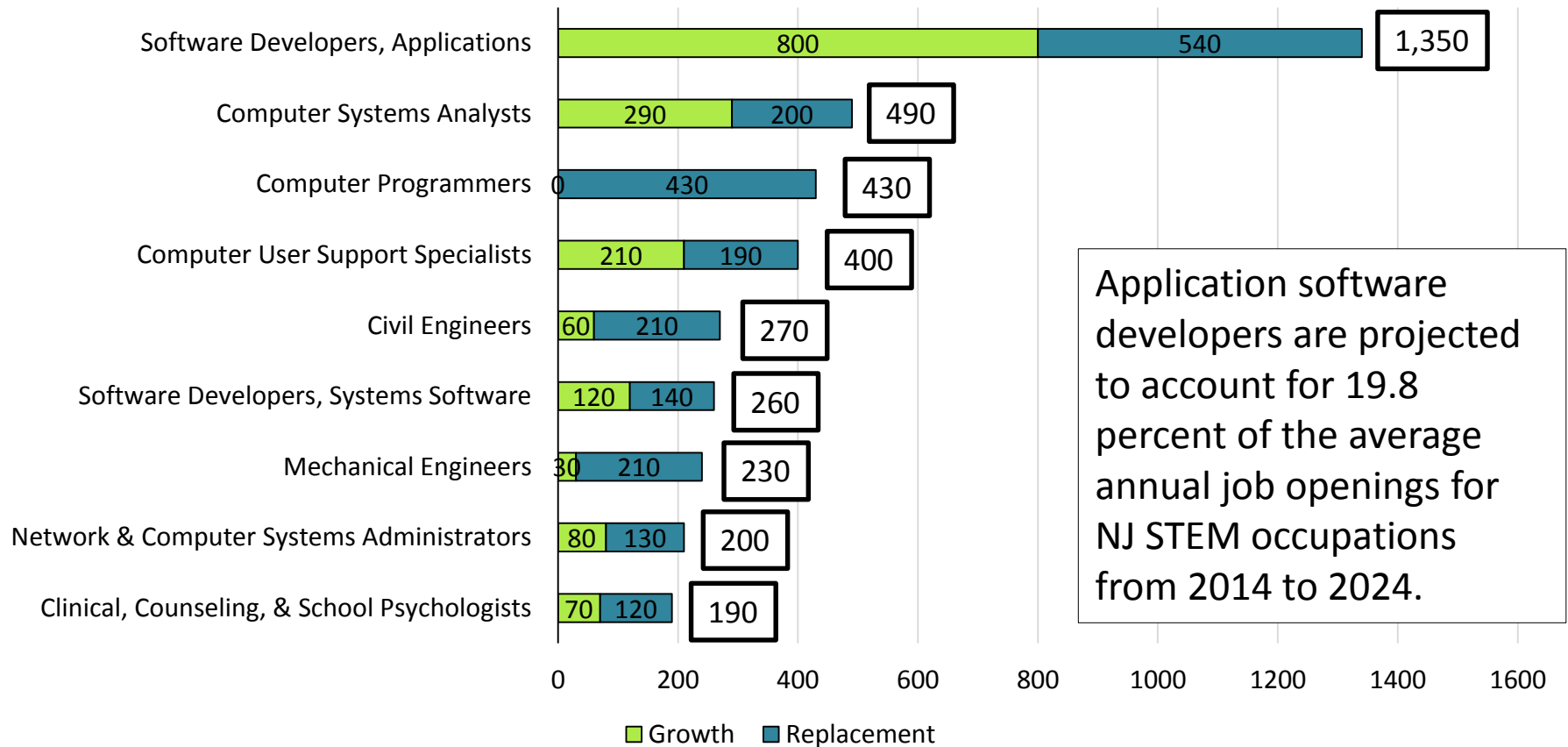# NJ DETAILED OCCUPATIONAL EMPLOYMENT PROJECTIONS 2014-2024

Occupational Title	Employment				Average Annual Job Openings		
	Actual	Projected	Change 2014-2024				
	2014	2024	Number	Percent	Total	Growth	Replacement
Total, All Occupations	4,214,100	4,491,550	277,450	6.6	131,040	32,130	98,910
Non-STEM Occupations	3,984,200	4,240,600	256,400	6.4	124,230	29,780	94,450
STEM Occupations	229,900	250,950	21,050	9.2	6,800	2,340	4,460
Computer and Mathematical Occupations	139,350	156,050	16,700	12.0	4,000	1,870	2,130
Architecture and Engineering Occupations	53,350	55,400	2,000	3.8	1,540	230	1,310
Life, Physical, and Social Science Occupations	37,200	39,500	2,300	6.3	1,260	240	1,020

- 34.4 percent of projected average annual job openings for STEM occupations will be due to growth over the ten year period from 2014 to 2024.

- STEM occupations are projected to experience a 9.2 percent employment growth by 2024.

Source: New Jersey Department of Labor and Workforce Development, 2014–2024 Industry and Occupational Employment Projections. Note: Total job openings may not add up exact due to rounding.

NEW JERSEY TECHNOLOGY INDUSTRY CLUSTER PROJECTED ANNUAL AVERAGE OPENINGS FOR STEM OCCUPATIONS

2014-2024 Projected Annual Average Job Openings

Occupation	Growth	Replacement	Total
Software Developers, Applications	800	540	1,350
Computer Systems Analysts	290	200	490
Computer Programmers	0	430	430
Computer User Support Specialists	210	190	400
Civil Engineers	60	210	270
Software Developers, Systems Software	120	140	260
Mechanical Engineers	30	210	230
Network & Computer Systems Administrators	80	130	200
Clinical, Counseling, & School Psychologists	70	120	190

☐ Growth ☐ Replacement

Application software developers are projected to account for 19.8 percent of the average annual job openings for NJ STEM occupations from 2014 to 2024.

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Source: New Jersey Department of Labor and Workforce Development, 2014–2024 Industry and Occupational Employment Projections. Note: Total job openings may not add up exact due to rounding.

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http://lwd.dol.state.nj.us/

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Trenton, NJ 08625-0057

Office of Research and Information

http://lwd.dol.state.nj.us/labor/lpa/LMI_index.html

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