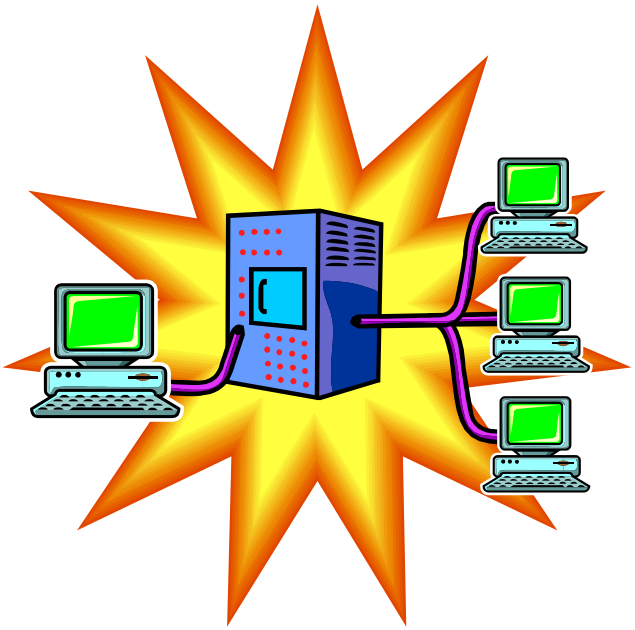
INFORMATION

TECHNOLOGY



Maryland Department of Labor, Licensing and Regulation
Division of Workforce Development
Office of Workforce Information and Performance
1100 N. Eutaw Street, Room 316
Baltimore, MD 21201

August 2006

Information Technology Cluster

What is included in the Information Technology Cluster?

"Information age" and "information economy" – are commonly heard expressions today, alluding to an era in which information is playing an increasingly important role. The reference is twofold: a recognition that a growing number of industries are in the business of producing, processing, or distributing information, as well as the notion that virtually all businesses are using information and information technology to operate more efficiently and productively. Individual consumers use information technology as well to gain knowledge, exchange ideas and opinions, and for entertainment and amusement. Information is now a high demand commodity—albeit a rather intangible one—and the technology to produce and disseminate it has become a driving force in the economy.

The Information Technology Cluster is comprised of industries that facilitate electronic information exchange at various stages of the process. This includes establishments that manufacture electronic computing and communications equipment; distributors of such goods; providers of computer systems and other information technology (IT) services; and establishments that repair IT equipment. This report groups these industries into the following divisions:

- ***Computer and Electronic Products Manufacturing*** includes establishments that produce or assemble IT equipment such as computers, wired and wireless communications devices and transmission equipment, AV entertainment products and magnetic and optical equipment, including software reproduction.

  NAICS

  3341 Computer and peripheral equipment manufacturing

  3342 Communications equipment manufacturing

  3343 Audio and video equipment manufacturing

  3346 Magnetic and optical media manufacturing and reproducing

- ***IT Wholesale Distribution*** includes merchant wholesalers engaged in the distribution of computers and related goods and electronic parts and equipment such as communications, broadcasting, and radar equipment, blank diskettes or audio/video tapes. Business-to-business electronic markets which use the Internet or other electronic means to bring together buyers and sellers (for a commission or fee) to exchange all manner of goods are also included under this subsector.

  NAICS

  423430 Computers, peripheral equipment, and software merchant wholesalers

  423690 Other electronic parts and equipment merchant wholesalers

  425110 Business-to-business electronic markets

- ***Information Technology Services*** is comprised of establishments that develop and/or publish software and provide support services to users; businesses that publish and/or broadcast on the Internet (including sites for news, sports, radio, books, videos, and games); providers of Internet access and Web operation (which may include Web hosting, Web page design, e-mail service, and related assistance); providers of specialized hosting activities (including Web, streaming services, or application hosting); application service provisioning, and data processing; and other information services, such as news syndicates, libraries, and archives.

  NAICS

  5112 Software publishers

  5161 Internet publishing and broadcasting

  5181 Internet service providers and web search portals

  5182 Data processing, hosting, and related services

  5191 Other information services

- ***Computer Systems Services*** consists of establishments that provide computer systems expertise to clients on a contract or fee basis. Customized services may involve writing, testing, and supporting software to meet a client's needs; designing computer systems that integrate hardware, software, and communication technologies, often including installation, training, and support as part of the service; providing on-site management and operation of clients' computer systems and/or data processing facilities, or supplying support services for such facilities; and other computer related services such as software installation and computer disaster recovery.

  NAICS

  5415 Computer systems design and related services

- ***Information Technology Equipment Repair and Maintenance*** is comprised of businesses that repair and maintain IT office equipment. Computers, printers, CD-ROM drives, and photocopying machines are among the devices maintained.

  NAICS

  811212 Computer and office machine repair and maintenance

For additional descriptive information on NAICS, go to www.census.gov/epcd/naics02/

This publication was developed using data from the Quarterly Census of Employment and Wages (ES 202) and from the Occupational Employment Statistics (OES) Programs.

Maryland
Employment and Wages in the Information Technology Cluster Industries
2002 and 2005

NAICS	Industry Description	Employment		Payroll		Average Weekly Wage	Industry Share of Cluster
		2002	2005	2002	2005	2005	
	Information Technology	**90,856**	**89,564**	**6,697,648,817**	**7,216,116,727**	**$1,549**	**100.0**
	Computer & Electronic Product Mfg.	**11,424**	**9,208**	**948,600,612**	**899,817,696**	**1,879**	**10.3**
3341	Computer & peripheral equipment mfg.	847	990	58,135,276	118,933,530	2,310	1.1
3342	Communications equipment mfg.	7,801	5,671	588,984,341	495,783,856	1,681	6.3
3343	Audio & video equipment mfg.	124	116	8,860,692	8,298,920	1,376	0.1
3346	Magnetic media mfg. & reproducing	2,652	2,431	292,620,303	276,801,390	2,190	2.7
	IT Wholesale Distribution	**12,629**	**11,811**	**1,035,679,369**	**1,058,220,232**	**1,723**	**13.2**
423430	Computer & software merchant wholesalers	6,606	5,908	620,417,360	606,613,064	1,975	6.6
423690	Other electronic parts merchant wholesalers	4,640	4,609	328,977,621	371,801,587	1,551	5.1
425110	Business to business electronic markets	1,383	1,294	86,284,388	79,805,581	1,186	1.4
	Information Technology Services	**15,156**	**13,773**	**806,833,813**	**759,669,675**	**1,061**	**15.3**
5112	Software publishers	1,997	1,652	174,290,290	152,689,417	1,777	1.8
5161	Internet publishing & broadcasting	743	628	48,665,208	46,408,542	1,421	0.7
5181	ISPs & web search portals	1,848	1,958	121,672,682	147,632,565	1,450	2.2
5182	Data processing & related services	6,589	5,284	365,315,447	296,136,818	1,078	5.9
5191	Other information services	3,979	4,251	96,890,186	116,802,333	528	4.7
	Computer Systems Services	**50,952**	**54,064**	**3,874,638,356**	**4,459,003,137**	**1,586**	**60.4**
5415	Computer systems design & related svcs.	50,952	54,064	3,874,638,356	4,459,003,137	1,586	60.4
	IT Equipment Repair & Maintenance	**695**	**708**	**31,896,667**	**39,405,987**	**1,070**	**0.8**
811212	Computer & office machine repair	695	708	31,896,667	39,405,987	1,070	0.8

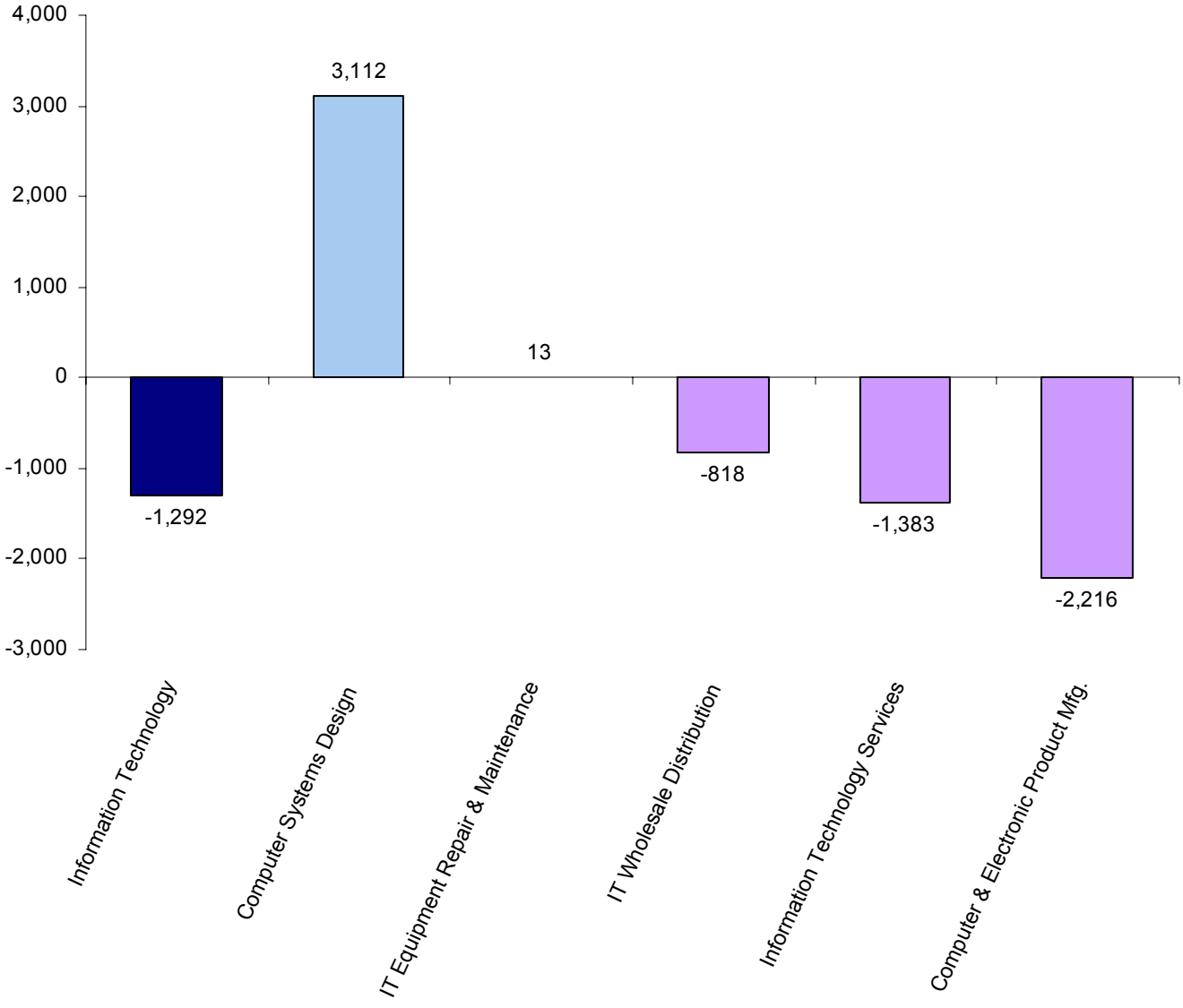
- Dotcom layoffs and the subsequent economic slowdown which impacted performance throughout Maryland's economy in the early part of the decade clearly affected employment levels in the IT Cluster. Employment in the Cluster fell by about 5.6% between 2001 and 2002. Downsizing, affecting nearly every industry within the Cluster, continued through 2003, however, the rate of decline slowed considerably. Beginning in 2004 and into 2005, a turnaround was in the making, with growth, albeit slow, adding about 730 jobs to industry payrolls between 2003 and 2005.
- Although Montgomery and Prince George's counties, combined, held about 52% of all Cluster employment in 2005, the loss of just over 5,500 jobs diminished this concentration from that of 57% in 2002. With the exception of Garrett County, the remaining Maryland jurisdictions reported expansion in IT employment through 2005. Some of the most noteworthy gains occurred in Baltimore County, Anne Arundel County and Baltimore City.
- Employment in the Cluster is clearly dominated by firms providing computer systems design and related services, a subsector responsible for about 6 out of every 10 IT industry jobs. Employment in computer design firms has expanded without interruption since 2002, making this one of the only Cluster subsectors to turn in a positive performance over the 2002-2005 period.
- Average weekly earnings in the IT Cluster, at $1549 in 2005, were about 82% higher than the average of $853 paid to workers in all industries. Weekly wages of $2,310 paid in computer & peripheral equipment manufacturing and those of $2,190 paid in magnetic media manufacturing/reproducing were the highest in a ranking of individual IT industries.

Maryland
Employment in the Information Technology Cluster Industries
2001 - 2005

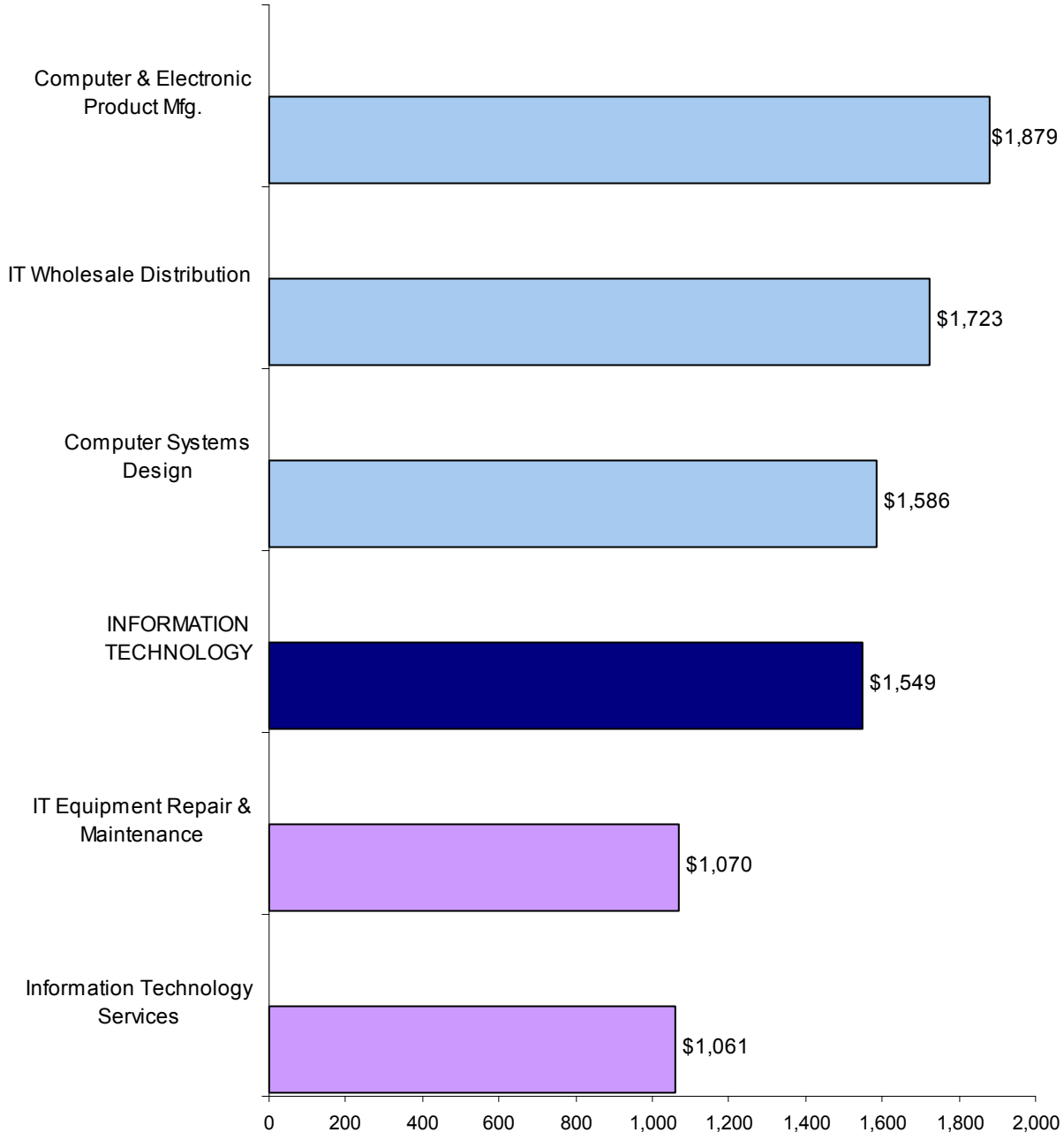
NAICS	Industry Description	Employment				
		2001	2002	2003	2004	2005
	Information Technology	**96,222**	**90,856**	**88,833**	**89,150**	**89,564**
	Computer & Electronic Product Mfg.	**13,096**	**11,424**	**10,023**	**9,732**	**9,208**
3341	Computer & peripheral equipment mfg.	870	847	809	901	990
3342	Communications equipment mfg.	9,233	7,801	6,608	6,197	5,671
3343	Audio & video equipment mfg.	128	124	115	115	116
3346	Magnetic media mfg. & reproducing	2,865	2,652	2,491	2,519	2,431
	IT Wholesale Distribution	**13,473**	**12,629**	**11,929**	**11,698**	**11,811**
423430	Computer & software merchant wholesalers	7,245	6,606	6,222	6,025	5,908
423690	Other electronic parts merchant wholesalers	4,792	4,640	4,375	4,357	4,609
425110	Business to business electronic markets	1,436	1,383	1,332	1,316	1,294
	Information Technology Services	**16,159**	**15,156**	**14,660**	**14,003**	**13,773**
5112	Software publishers	2,139	1,997	1,930	1,515	1,652
5161	Internet publishing & broadcasting	766	743	749	675	628
5181	ISPs & web search portals	2,119	1,848	1,682	1,846	1,958
5182	Data processing & related services	6,933	6,589	6,220	5,832	5,284
5191	Other information services	4,202	3,979	4,079	4,135	4,251
	Computer Systems Services	**52,825**	**50,952**	**51,507**	**52,995**	**54,064**
5415	Computer systems design & related svcs.	52,825	50,952	51,507	52,955	54,064
	IT Equipment Repair & Maintenance	**669**	**695**	**714**	**722**	**708**
811212	Computer & office machine repair	669	695	714	722	708

	Change	2001-2002	2002-2003	2003-2004	2004-2005
Information Technology Cluster Employment Changes	**Number**	-5,366	-2,023	317	414
	Percent	-5.6%	-2.2%	0.4%	-0.5%

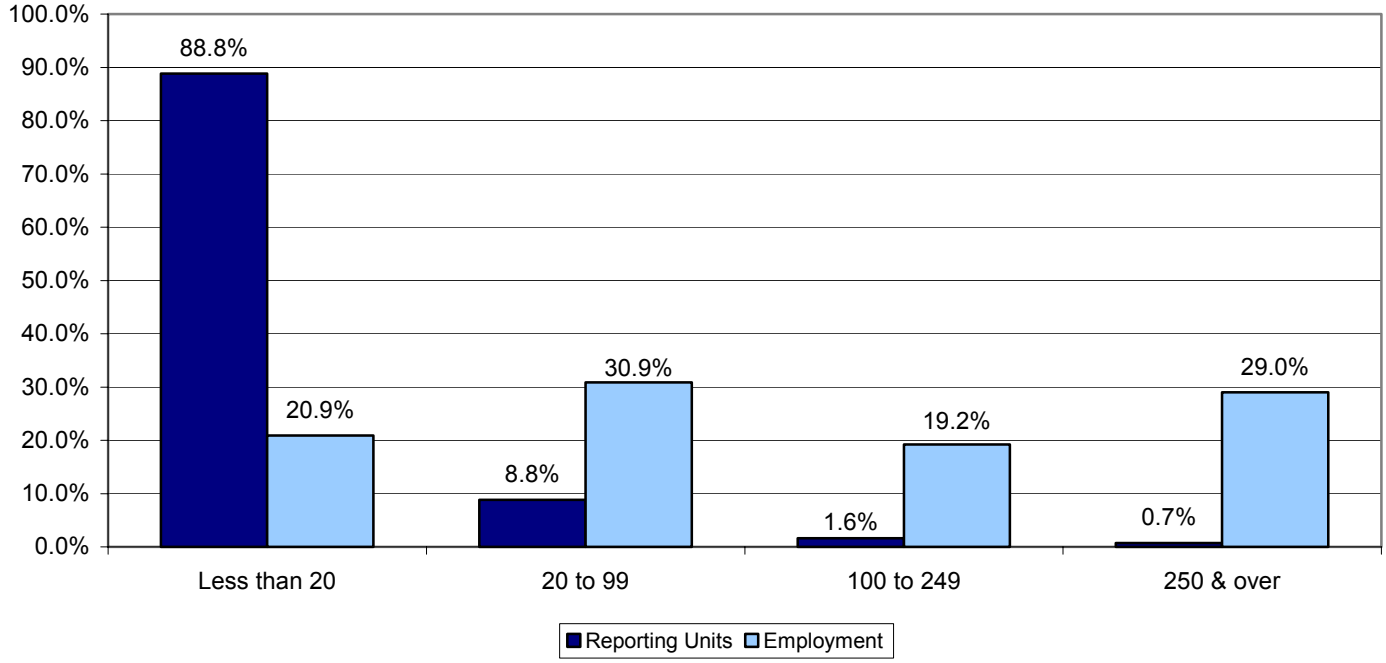
Maryland
Employment Changes in the Information Technology Industry Subsectors
2002 - 2005



Maryland
Wages in the Information Technology Cluster Industry Subsectors
2005



Reporting Units and Employment Concentration in the Information Technology Cluster by Size Class * Based on 4th Quarter 2005 Average Employment



	Reporting Units				Employment			
	Less than 20	20 to 99	100 to 249	250 & over	Less than 20	20 to 99	100 to 249	250 & over
Information Technology Cluster	6,547	649	119	55	18,915	27,935	17,365	26,275
Percent of Total	88.8%	8.8%	1.6%	0.7%	20.9%	30.9%	19.2%	29.0%

- About 7,370 establishments made up the Information Technology Cluster during the 4th quarter of 2005. Nearly 9 out of every 10 businesses in the cluster were categorized as small employers, employing fewer than 20 workers. The highest density of small businesses were classified as computer systems design firms.
- While about 70% of all computer design firms were characterized as small employers, the highest share -- 32.3% -- of this industry's employment was found in mid-sized establishments employing 20-99 workers.
- Within the cluster, mid-sized (20-99 workers) and large establishments (250 or more workers), while accounting for less than 10% of all business locations, employed the majority -- about 60% -- of the cluster's workforce.
- When looking at the cluster's subsectors, the concentration of workers among computer/electronic manufacturers and IT wholesalers is highest in the 250 & over employment category; businesses engaged in information technology services, along with computer systems design firms, have their highest worker concentration in the 20-99 size grouping while the highest share of jobs in IT equipment repair and maintenance businesses is in the smallest (less than 20) size class category.

* Includes establishments in all Information Technology NAICS industries that cannot be distributed geographically.

Maryland

Occupational Staffing in the Information Technology Cluster

Occupational Code	Occupation	% of Total Info Tech Employment
15-1032	Computer Software Engineers, Systems Software	8.02
15-1031	Computer Software Engineers, Applications	6.91
41-4012	Sales Reps., WT & Mfg., exc. Technical & Sci. Products	5.24
15-1041	Computer Support Specialists	5.08
15-1051	Computer Systems Analysts	4.18
15-1021	Computer Programmers	3.70
11-1021	General & Operations Managers	3.57
15-1071	Network & Computer Systems Administrators	2.95
15-1081	Network Systems & Data Communications Analysts	2.73
11-3021	Computer & Information Systems Managers	2.58
41-4011	Sales Reps., WT & Mfg., Technical & Sci. Products	2.44
43-4051	Customer Service Representatives	2.13
49-2011	Computer, Automated Teller & Office Machine Repairers	1.87
43-9061	Office Clerks, General	1.76
13-1111	Management Analysts	1.63
43-3031	Bookkeeping, Accounting & Auditing Clerks	1.61
17-2061	Computer Hardware Engineers	1.56
15-1061	Database Administrators	1.42
43-6011	Executive Secretaries & Administrative Assistants	1.38
13-2011	Accountants & Auditors	1.25
53-7062	Laborers & Freight, Stock, Material Movers, Hand	1.19
51-2092	Team Assemblers	1.13
43-1011	First Line Supv./Mgrs., Office & Admin. Support Wkrs.	1.02
43-9021	Data Entry Keyers	1.01
43-6014	Secretaries, exc. Legal, Medical & Executive	0.99
11-2022	Sales Managers	0.93
15-2011	Computer & Information Scientists, Research	0.91
43-5071	Shipping, Receiving & Traffic Clerks	0.90
15-2031	Operations Research Analysts	0.77

Just over 70% of employment in the Information Technology Cluster is in the above-referenced occupations. Employment concentration is highest in Computer & Mathematical occupations, a group which claims about 4 out of every 10 jobs in this grouping of top occupations. Office and Administrative Support occupations, the second largest job classification in this ranking, account for about 10% of the staffing.

Occupational Coding Legend

11 Management Occupations
13 Business & Finance Occupations
15 Computer & Mathematical Occupations
17 Architecture & Engineering Occupations
41 Sales & Related Occupations
43 Office & Administrative Support Occupations
49 Installation, Maintenance & Repair Occupations
51 Production Occupations
53 Transportation & Material Moving Occupations

Maryland

Occupational Demand, Training and Wages in the Information Technology Cluster

Occupation	Annual Openings			Training Code	Median Annual Wage
	Growth	Replacements	Total		
Computer Software Engineers, Systems Software	665	135	800	5	$92,700
Computer Software Engineers, Applications	495	110	605	5	81,200
Sales Reps., WT & Mfg., exc. Technical & Scientific Products	520	645	1,165	10	51,325
Computer Support Specialists	315	135	450	6	43,625
Computer Systems Analysts	485	230	715	5	79,075
Computer Programmers	180	305	485	5	67,675
General & Operations Managers	1,420	1,230	2,650	4	87,375
Network & Computer Systems Administrators	250	70	320	5	66,025
Network Systems & Data Communications Analysts	335	71	406	5	69,600
Computer & Information Systems Managers	295	155	450	4	104,675
Sales Reps., WT & Mfg., Technical & Scientific Products	150	145	295	10	57,850
Customer Service Representatives	735	485	1,220	10	30,500
Computer, Automated Teller & Office Machine Repairers	75	45	120	7	40,125
Office Clerks, General	695	1,165	1,860	11	26,100
Management Analysts	415	255	670	4	73,900
Bookkeeping, Accounting & Auditing Clerks	150	550	700	10	33,500
Computer Hardware Engineers	30	45	75	5	87,175
Database Administrators	100	25	125	5	66,600
Executive Secretaries & Administrative Assistants	400	580	980	10	39,500
Accountants & Auditors	300	365	665	5	55,300
Laborers & Freight, Stock, Material Movers, Hand	175	1,280	1,455	11	21,975
Team Assemblers	50	275	325	10	25,400
First Line Supv./Mgrs., Office & Admin. Support Wkrs.	290	620	910	8	45,025
Data Entry Keyers	-25	160	160	10	25,250
Secretaries, exc. Legal, Medical & Executive	230	835	1,065	10	31,250
Sales Managers	280	155	435	4	90,050
Computer & Information Scientists, Research	50	25	75	2	93,450
Shipping, Receiving & Traffic Clerks	15	210	225	11	26,450
Operations Research Analysts	20	45	65	3	71,750

Data represents economy-wide demand for 2002-2012. Growth & replacements may not add to total due to rounding.
Wages adjusted to reflect inflationary pressures through March 2006.

Education and Training Categories

Occupations are classified into 1 of 11 categories by the Bureau of Labor Statistics based on analyses of the occupation's usual education and training requirements conducted while developing information to present in the *Occupational Outlook Handbook*. The 11 classifications are as follows:

1 ***First professional degree.*** Completion of the academic program usually requires at least 6 years of full-time equivalent academic study, including college study prior to entering the professional degree program.

2 ***Doctoral degree.*** Completion of the degree program usually requires at least 3 years of full-time equivalent academic work beyond the bachelor's degree.

3 ***Master's degree.*** Completion of the degree program usually requires 1 or 2 years of full-time equivalent study beyond the bachelor's degree.

4 ***Bachelor's or higher degree, plus work experience.*** Most occupations in this category are managerial occupations that require experience in a related nonmanagerial position.

5 ***Bachelor's degree.*** Completion of the degree program generally requires at least 4 years but not more than 5 years of full-time equivalent academic work.

6 ***Associate degree.*** Completion of the degree program usually requires at least 2 years of full-time equivalent academic study.

7 ***Postsecondary vocational award.*** Some programs last only a few weeks while others may last more than a year. In some occupations, a license is needed that requires passing an examination after completion of the training.

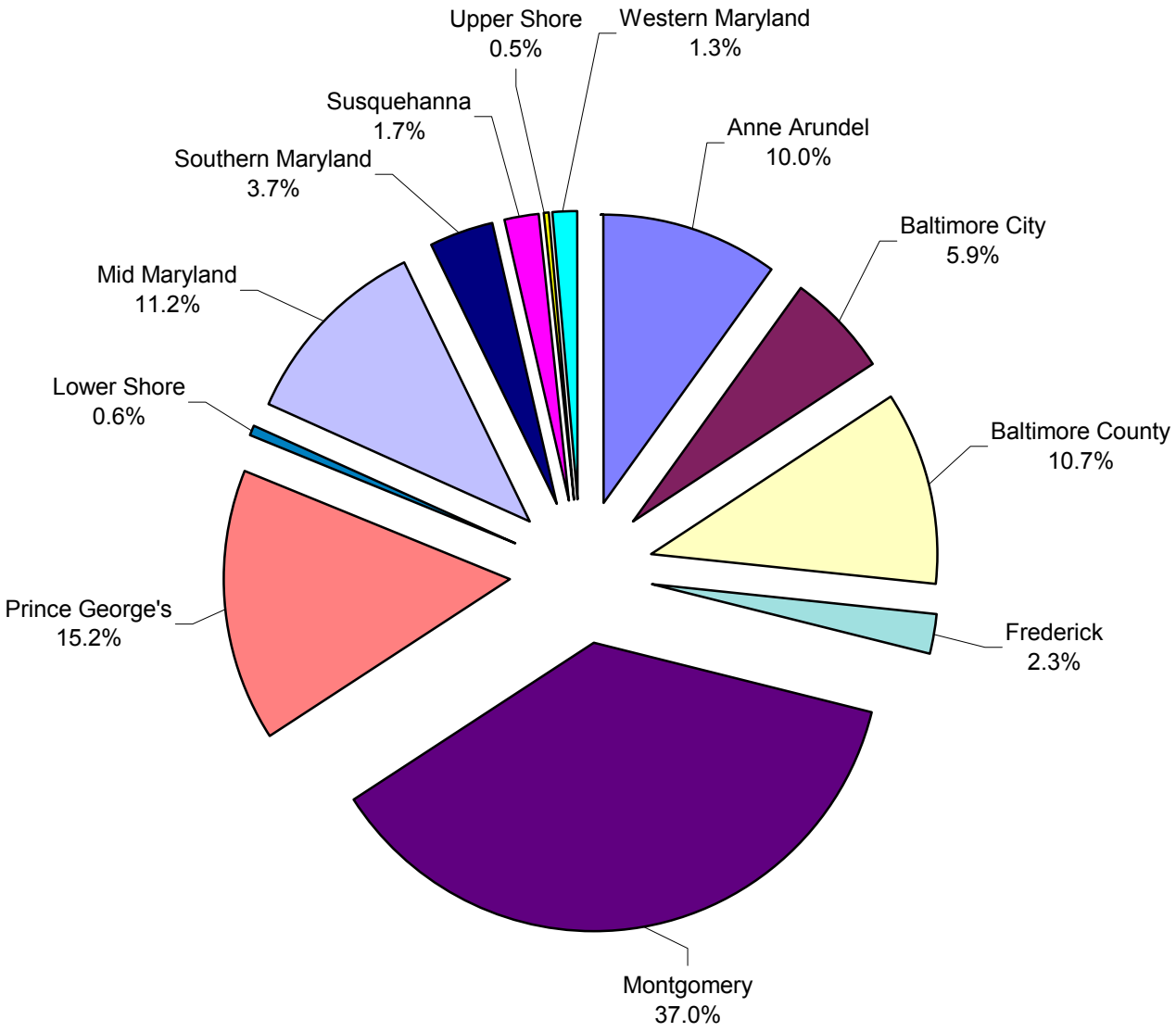
8 ***Work experience in a related occupation.*** Some occupations requiring work experience are supervisory or managerial occupations.

9 ***Long-term on-the-job training.*** This category includes occupations that generally require more than 12 months of on-the-job training or combined work experience and formal classroom instruction for workers to develop the skills needed for average job performance. This category includes formal and informal apprenticeships that may last up to 4 years and short-term intensive employer-sponsored training that workers must successfully complete. Individuals undergoing training are generally considered to be employed in the occupation. This category includes occupations in which workers may gain experience in non-work activities, such as professional athletes who gain experience through participation in athletic programs in academic institutions.

10 ***Moderate-term on-the-job training.*** This category includes occupations in which workers can develop the skills needed for average job performance after 1 to 12 months of combined on-the-job experience and informal training.

11 ***Short-term on-the-job training.*** This category covers occupations in which workers can develop the skills needed for average job performance after a short demonstration or up to one month of on-the-job experience or instruction.

Information Technology - 2005



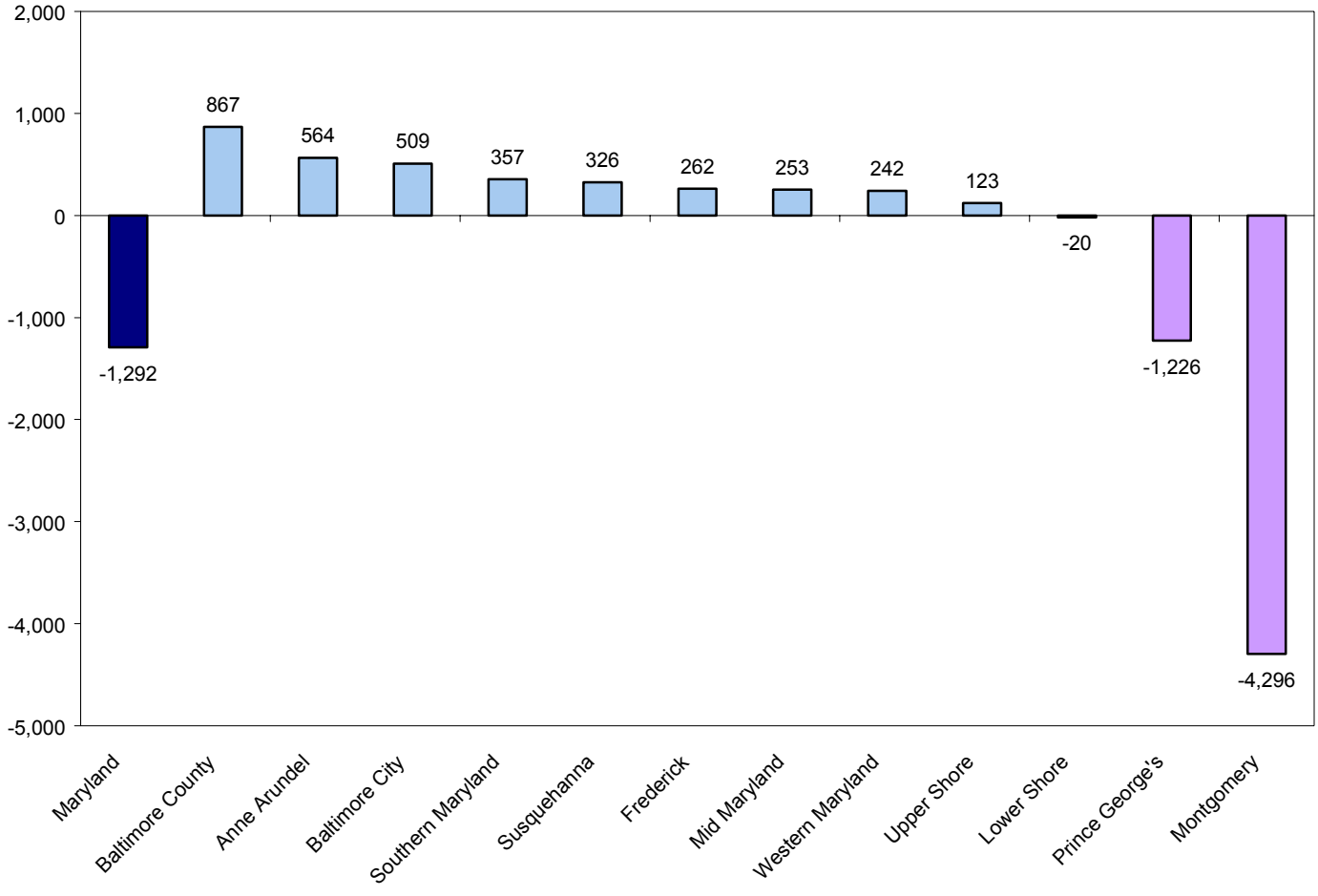
Employment and Wages in the Information Technology Cluster
By WIA and Select Local Jurisdictions

WIA	Employment 2002	Employment 2005	Employment Change 2002 - 2005	Number of Reporting Units 2005	Total Wages 2005	Average Weekly Wage 2005
Anne Arundel	**7,847**	**8,411**	**564**	**586**	**$669,736,078**	**$1,531**
Baltimore City	**4,483**	**4,992**	**509**	**299**	**379,995,334**	**1,464**
Baltimore County	**8,127**	**8,994**	**867**	**600**	**575,660,649**	**1,231**
Frederick	**1,647**	**1,909**	**262**	**222**	**132,305,057**	**1,333**
Montgomery	**35,544**	**31,248**	**-4,296**	**1,856**	**2,844,853,950**	**1,751**
Prince George's	**14,060**	**12,834**	**-1,226**	**681**	**1,013,492,915**	**1,519**
Lower Shore	**542**	**522**	**-20**	**64**	**17,977,783**	**662**
Somerset	D	D	D	D	D	D
Wicomico	395	395	0	36	13,702,085	667
Worcester	D	D	D	D	D	D
Mid Maryland	**9,212**	**9,465**	**253**	**775**	**789,756,318**	**1,605**
Carroll	574	663	89	147	36,363,350	1,055
Howard	8,638	8,802	164	628	753,392,968	1,646
Southern Maryland	**2,739**	**3,096**	**357**	**215**	**198,852,998**	**1,235**
Calvert	375	465	90	57	24,240,052	1,002
Charles	436	629	193	91	37,019,392	1,132
St Mary's	1,928	2,002	74	67	137,593,554	1,322
Susquehanna	**1,076**	**1,402**	**326**	**156**	**60,384,496**	**828**
Cecil	109	125	16	29	4,143,899	638
Harford	967	1,277	310	127	56,240,597	847
Upper Shore	**324**	**447**	**123**	**58**	**19,442,380**	**836**
Caroline	D	D	D	D	D	D
Dorchester	D	D	D	D	D	D
Kent	D	D	D	D	D	D
Queen Anne's	75	97	22	28	4,126,098	818
Talbot	116	213	97	19	11,147,684	1,006
Western Maryland	**826**	**1,068**	**242**	**76**	**31,286,332**	**563**
Allegany	67	70	3	8	1,577,123	433
Garrett	111	94	-17	19	2,756,087	564
Washington	648	904	256	49	26,953,122	573
Nondistributable*	**4,429**	**5,176**	**747**	**1,847**	**482,372,437**	**1,792**
Maryland	**90,856**	**89,564**	**-1,292**	**7,435**	**7,216,116,727**	**1,549**

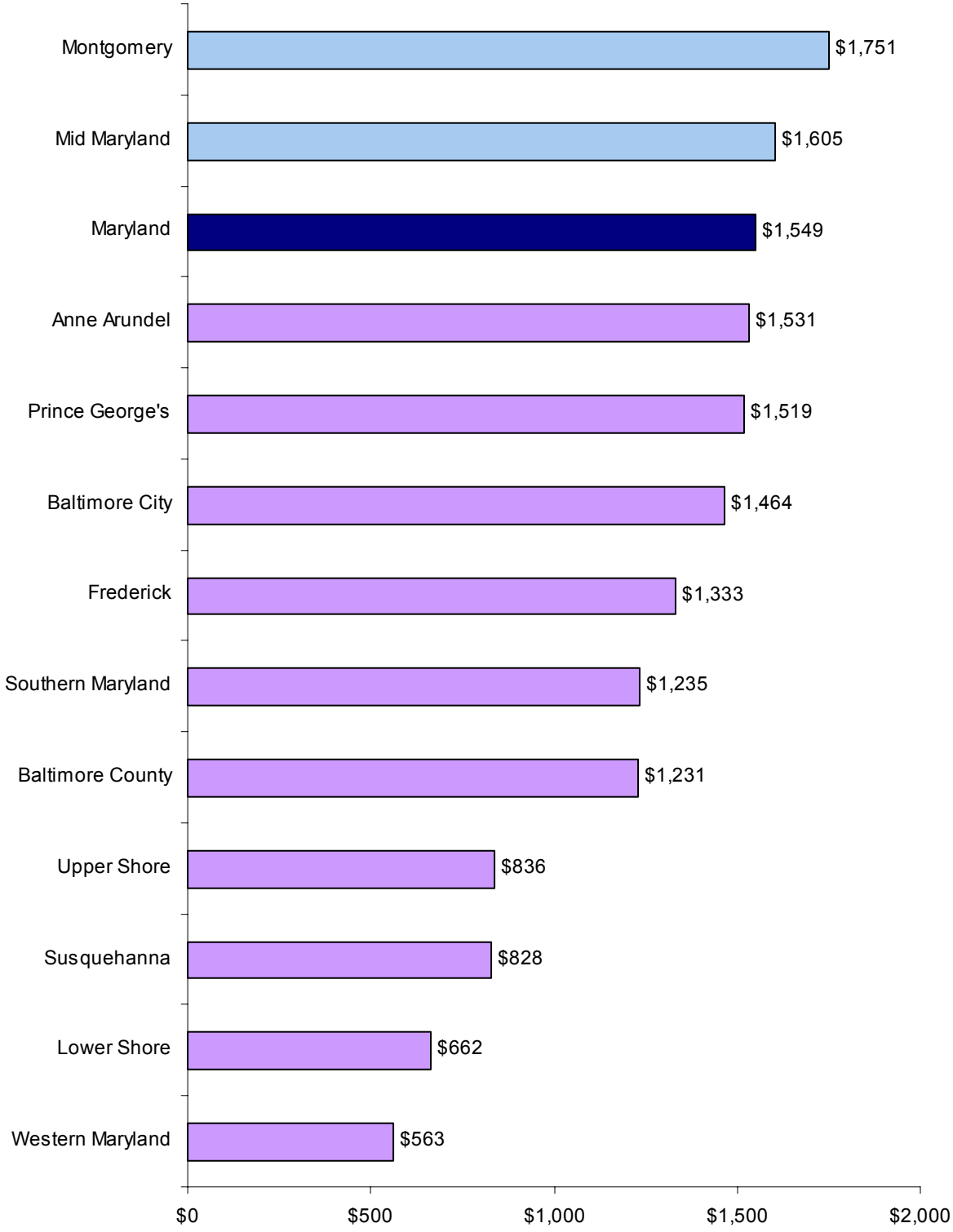
D - Data cannot be published due to disclosure.

* Includes establishments in all Information Technology Cluster NAICS industries that cannot be distributed geographically.

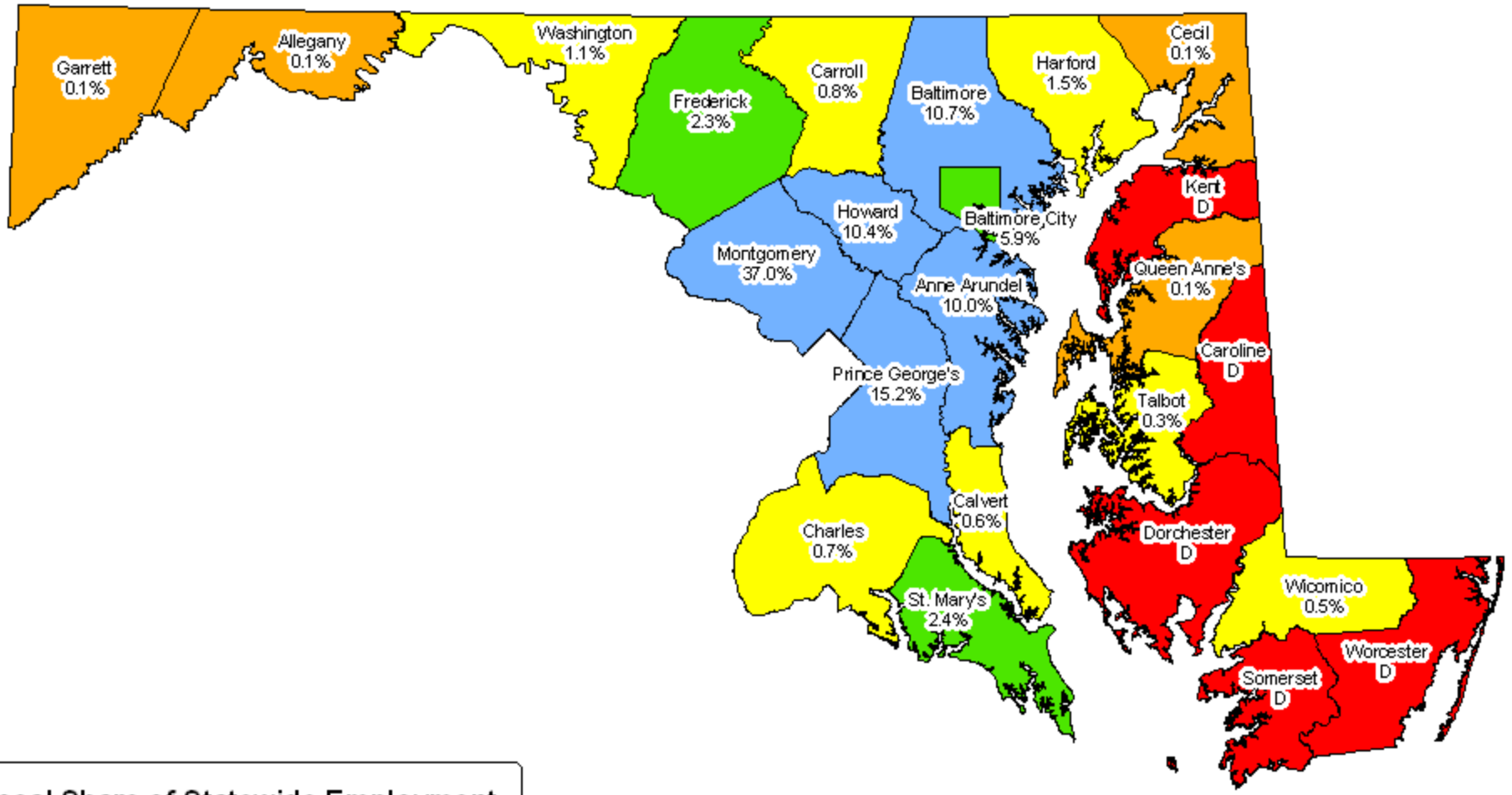
Employment Changes in the Information Technology Cluster by WIA
2002 - 2005



Average Weekly Wages in the Information Technology Cluster by WIA
2005



Local Share of Statewide Employment in the Information Technology Cluster
2005



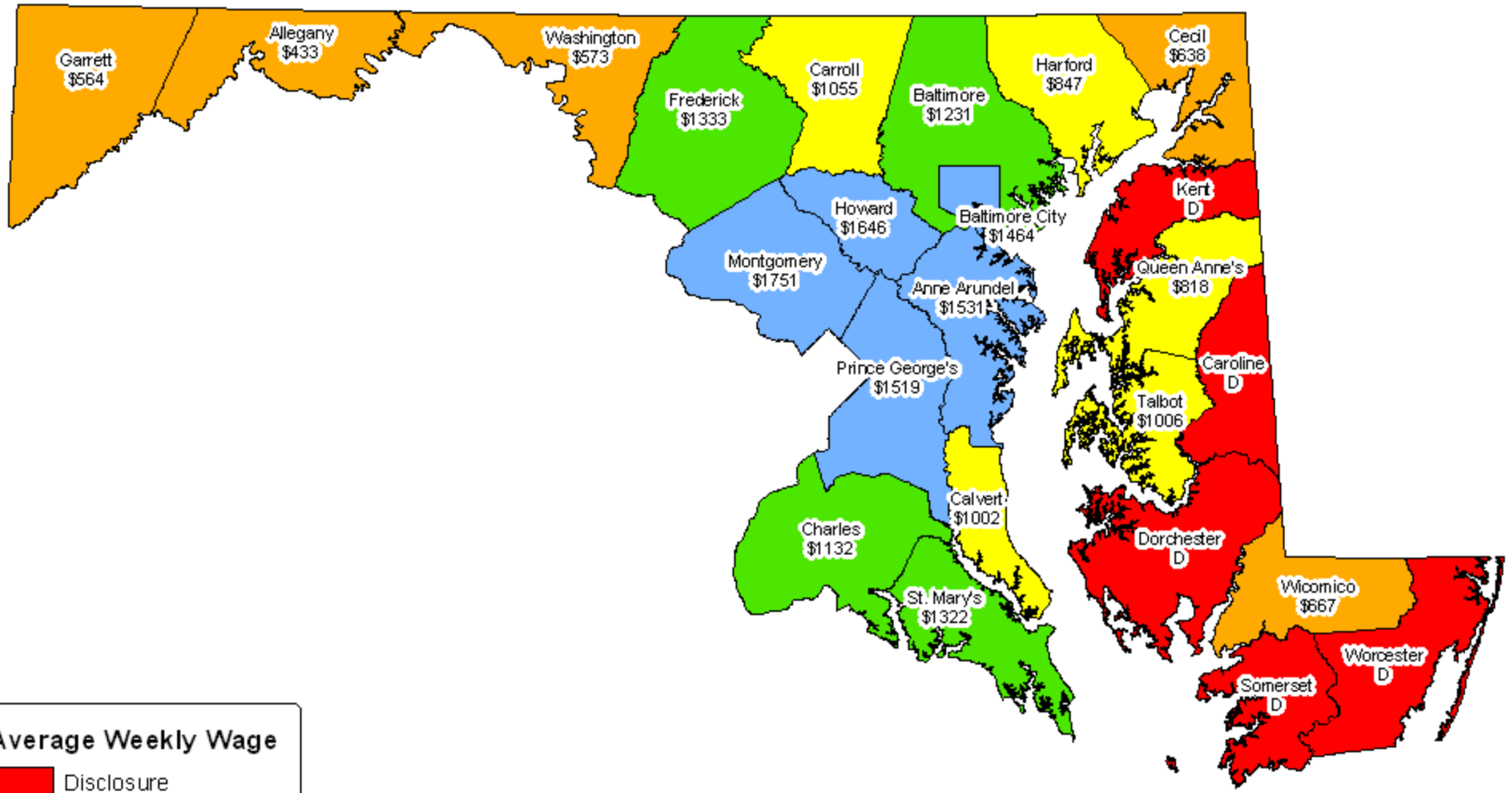
Local Share of Statewide Employment

- Disclosure
- 0.1 - 0.2
- 0.3 - 2.0
- 2.1 - 9.5
- 9.6 - 37.0

Prepared by the Division of Workforce Development - Office of Workforce Information & Performance

August 2006

Average Weekly Wage in the Information Technology Cluster
2005



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