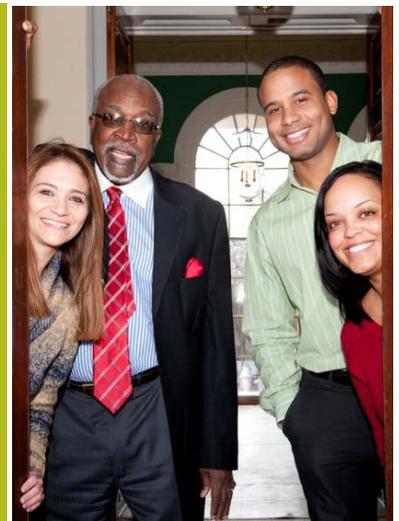


Technical Report:
A Study of Occupational Shifts and
Workforce Characteristics for
Prince George's County

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Prepared for:
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Introduction

This report serves as the Technical Report to the *Study of Occupational Shifts and Workforce Characteristics* in Prince George's County prepared for the Prince George's County Planning Department of the Maryland-National Capital Park and Planning Commission (M-NCPPC). This Technical Report provides a more detailed analysis of the quantitative and qualitative findings that are the underpinnings of the results of the study.

The objective of the study is to provide policy/decision makers with a better understanding of occupational changes and workforce development needs, and to develop a strategy to meet these needs and promote regional growth and business development. This calls for a comprehensive assessment of the expected future workforce demands from likely industry drivers and a rigorous analysis of the county's capacity to meet these future needs.

The most effective way to assess industry drivers is to focus on industry clusters. Industry clusters have become a mainstay of regional economic analysis because of the recognition that individual industries do not stand alone within local economies, but are better understood as being part of a broader complex of industries that are inter-related.

Given that the objective of this study is to advance economic development in the county, the focus is on those industries that address the "wealth creating" sectors of the county's economy, often referred to as "economic base" or "primary" industries. These primary industries address needs beyond local residents and businesses. They are either involved in exports or substitutes for imported goods and services from outside of the county. Non-primary industries, often referred to as local or sheltered economic activity, do not generate new economic wealth for the county. However, they are important because they address local needs and ensure a high quality of life for residents. Typically, these non-primary industries include most retail services, physician offices, state and local government, and other firms that provide services to local residents.

To help ensure that a robust strategy was developed that meets the needs of the county's primary industrial base, thereby fostering regional growth and business development, the analysis focused on addressing several key questions, including:

- **What are the primary industry clusters in the county and what is the likely growth potential of each primary industry cluster?** This required assessing how well the county has fared in the growth of its primary industry clusters, how they are positioned for future growth considering the broader industry cluster trends found in the region, and how it is positioned for future growth because of core technology competencies found across its base of industry, universities, and federal labs. Likely low and high growth scenarios were identified for each primary industry cluster based on its past performance, growth rate relative to the region and position to gain market share based on the presence of core technology competencies.
- **How will the expected growth in Prince George's primary industry clusters translate into industry demand for workers?** Based on the expected primary industry growth scenarios, standard occupational forecasting techniques were utilized to forecast future workforce demands of the county's primary industry clusters.
- **What is the current capacity to generate labor supply and how does it compare to demand across the primary industry clusters?** In other words, looking to the future, will the county be able to generate the workforce that will be needed to meet industry demand? The current output

of graduates from post-secondary institutions, workforce training programs and apprenticeship programs were examined to determine if they are producing the graduates that will be needed.

- **What are the broader patterns of labor supply in Prince George’s County?** Current labor market conditions, current and projected workforce demographic and socio-economic characteristics, in- and out-migration trends, and commuting patterns were examined to assess current market conditions.
- **What is the strategic position and economic development readiness of the county?** Input and feedback from interviews with industry executives and focus group discussions with workforce and economic development organizations were sought to ensure that the data analysis was well-grounded in perceived reality. In addition, the county’s economic development readiness indicators were benchmarked against other comparable counties, both in the region and across the nation.

Details on the methodology used and data developed to support the labor demand and supply analyses are found in the sections of this Technical Report that follow. The strategic assessments and strategy development informed by these detailed analyses are found in the main report of the study.

Study Team

To conduct this study, M-NCPPC sought out a consulting team with expertise and experience in economic development planning, research and policy development, economic and public policy analysis, commercial real estate trends analysis, and labor force and industry trends analyses.

Battelle’s Technology Partnership Practice (TPP), the economic development consulting arm of the world’s largest independent non-profit research and development organization, led the effort. Battelle TPP is the national leader in advanced, technology-based and cluster-driven economic development practice with an established track record in developing and advising many of the most successful modern development programs in the U.S. Battelle TPP is also the leading firm in advancing workforce development strategies across the U.S.



The University of Baltimore’s Jacob France Institute, a research unit at the Merrick School of Business at the University of Baltimore, provided in-depth analysis of labor supply and forecasting of workforce development. The Jacob France Institute is a leading Maryland research group on workforce development research, planning and evaluation. The Institute prepared the State of the Workforce Report for the Governor’s Workforce Investment Board and has conducted workforce studies for numerous communities in Maryland.

Supporting the forecasting of workforce development and economic readiness indicator assessment is Market-Economics, Inc., a well regarded economic consulting firm with emphasis in real estate analysis and forecasting, financial risk management, small business market analysis and economic forecasting of housing and employment. Among its clients are the Baltimore Development Corporation, Maryland Transportation Authority, Appalachian Regional Commission, and City of Annapolis.

Performance of Prince George's County's Primary Industry Clusters

Gaining an in-depth understanding of the likely growth patterns of the county's primary industry clusters is a critical input to assessing what the workforce development demands will be in the county. The standard approach to regional economic analysis considers the future growth prospects based on an analysis of recent economic performance, in addition to considering a variety of other indicators. The first step in the analysis is to identify the county's primary industry clusters.

Identification of Twenty-Three Primary Industry Clusters in Prince George's County

Industry clusters represent closely related industries that are logically connected. Many industry clusters share a common market that they serve, while others are based more on shared "know how" such as in the biosciences or information technology. There is no standard set of industry clusters defined for all regions. Instead, identifying industry clusters present in a locality requires analyzing the detailed industries found there that are focused on economic base activities, those industries that address the wealth creating sectors of the county's economy, and recognizing where there are appropriate fits.

In consultation with M-NCPPC, Battelle identified 380 detailed industries involved in economic base activities and organized them into 23 primary industry clusters. Altogether, these 23 primary industry clusters employed 150,689 workers in Prince George's County in 2008 or 48 percent of total employment in the county. These 23 industry clusters are described in the Table 1.

Table 1: Listing of Primary Industry Clusters Identified in Prince George's County

Industry Cluster	Prince George's County Employment, 2008	Types of Industries
Aerospace Products & Parts	517	Aircraft and aircraft engines and parts mfg; guided missile and related parts mfg.
Big Box Retail	11,217	Home centers, clothing stores, book stores
Biosciences	1,168	R&D, medical labs, drugs & pharmaceuticals, medical devices
Business Consulting Services	2,202	Management consulting, marketing consulting, human resources
Business Support Services	8,512	Office administration, facility support, security guards, janitorial
Communications & Media Equipment	210	Telephone, broadcast and wireless comm. equipment, A/V equip, fiber optic cables
Computer & Peripheral Equipment	609	Computer and related device mfg; software and A/V media reproduction
Construction	31,810	Commercial, industrial and residential contractors of all types
Finance & Insurance	6,986	Commercial banks, investment banking, insurance agencies
Hospitals and Health Services	12,041	Hospitals plus outpatient facilities, nursing care, mental health facilities, kidney dialysis centers
Legal	1,291	Lawyer offices
Marketing & Advertising	803	Graphic design, advertising agencies, media buying and representatives, market research, opinion polling
Media Services	212	Video production, sound recording, radio and TV
Navigation & Control Instruments	1,120	Search, detection, and navigation instruments; Environmental controls; analytical lab instr.
Research, Development & Engineering Services	3,671	Engineering services, non-bioscience research and development
Semiconductors & Electronic Components	23	Electron tubes, circuit boards, semiconductors and related devices
Software & Computer Services	10,501	Data processing/hosting, programming, systems design, computer facilities
Strategic Office Centers	3,070	Managing offices, call centers
Telecommunications Services	2,390	Landline, wireless, web portals, resellers
Traditional Print Media	2,057	Commercial printing, newspapers, books, periodicals
Transportation, Distribution and Logistics	19,265	Commercial transportation, wholesalers, warehousing, transportation support
Travel & Tourism	5,575	Hotel and lodgings, museums, amusement, travel agencies, etc.
Federal Government	25,439	All types of federal agency employment, including labs

Source: Battelle analysis of Bureau of Labor Statistics Quarterly Census of Employment and Wages data from IMPLAN. LS QCEW data from IMPLAN.

It is important to note, that two of the industry clusters—big box retail and hospitals and health services—are not considered to be part of the economic base from the perspective of the overall Washington, D.C. Metropolitan Region¹ (the “region”). However, from the county’s perspective, there is competition across local jurisdictions within the region for these industries, so these two industry clusters are considered to be part of the county’s economic base. In addition, higher education could be considered to be the 24th primary industry cluster. However, due to data limitations, it is not possible to develop a complete picture of its economic position at the county or regional level, so it was not included. The data limitation is a result of public universities, such as the University of Maryland-College Park (UMCP) and Bowie State University, being included in state government industry employment, and therefore is not able to be separated out and independently analyzed. As a result, it is not possible to provide detailed analyses or forecasts of higher education employment in the county or the region. A full listing of the detailed industries comprising each of the 23 industry clusters is presented in Appendix A.

Regional Economic Analysis Assessment of Primary Industry Cluster Performance

Methodology

In the standard regional economic analysis approach, there are three basic regional economic measures used to assess the position of an industry cluster for a specific jurisdiction, region or state:

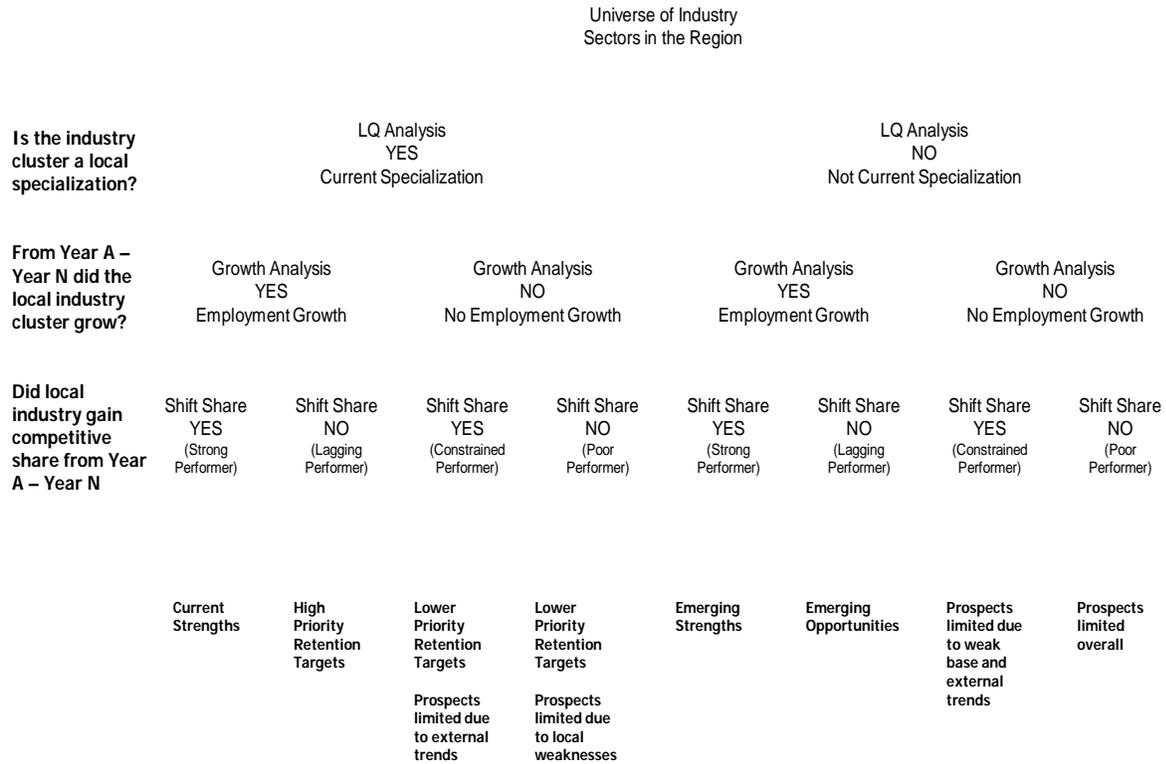
- **Relative concentration of industry cluster.** This is a measure of how specialized an industry cluster is in a specific geographic area relative to the nation, and so gauges “competitive advantage” for the industry cluster relative to the nation. The specific measurement of relative concentration is known as a location quotient. A location quotient is the share of a local area’s employment found in a particular industry cluster divided by the share of total industry employment in that industry cluster for the nation. A location quotient greater than 1.0 indicates a higher relative concentration, whereas a location quotient of less than 1.0 signifies a relative underrepresentation. A location quotient greater than 1.20 denotes employment concentration significantly above the national average, and is considered specialized.
- **Employment changes for industry cluster.** This is a more straightforward measure of whether an industry cluster is gaining or losing jobs in the geographic area. It is best to compare changes in employment over an entire business cycle (peak to peak) to ensure an “apples to apples” comparison. The last business cycle occurred over the 2001 to 2007 period. Also, available are the more recent employment changes from 2007 to 2008, but it is difficult to give much weight to this one year change since it represents just the first year of the two year recession just experienced.
- **Relative growth of industry cluster.** This third measure of regional trends examines whether a local industry cluster is gaining or losing competitive share compared to the nation. It is measured as the difference between the percentage change in employment in an industry cluster at the local geographic level minus the percentage in employment in that same industry cluster for the nation.

An Industry Targeting Analysis decision tree approach was applied to these regional economic measures to understand the current position and trajectory of an industry cluster for a local area (see Figure 1). By deploying the tools of industry targeting analysis, Battelle objectively and quantitatively identified

¹ The Washington metro area refers to the Washington–Arlington–Alexandria, DC–VA–MD–WV Metropolitan Statistical Area (MSA) as defined by the United States Office of Management and Budget. This region includes Washington, DC; Calvert, Charles, Frederick, Montgomery and Prince George’s Counties in Maryland and Arlington, Clarke, Fairfax, Fauquier, Frederick, Loudon, Prince William, Spotsylvania, Stafford and Warrant Counties and the Cities of Alexandria, Fairfax, Falls Church, Fredericksburg, Manassas and Manassas Park in Virginia and Jefferson County in West Virginia.

industry clusters that are “current strengths,” “high priority retention targets,” more challenging or “lower priority retention targets”, and “emerging strengths” and “emerging opportunities.”

Figure 1: Industry Targeting Analysis: Decision Tree



Results

The overall economy in Prince George’s County, as well as many of the primary industry clusters, underperformed in overall economic growth compared to both the nation and the Washington, D.C. Metropolitan Region (the “region”) over the full business cycle period of 2001 to 2007, though the job losses in the recession were below the national rate.² Total employment in the county grew 3.9 percent from 2001 to 2007, compared to 7.2 percent for the region, 5.2 percent for the state of Maryland, and 4.4 percent for the nation. (See Table 2). A particular weakness for the county was in private sector job growth, which advanced a mere 1.1 percent compared to a robust growth of 7.9 percent for the region, 5.3 percent for Maryland, and 4.3 percent for the nation.

² The Washington, D.C. Metropolitan Region is defined as the geographic area encompassing refers to the Washington–Arlington–Alexandria, DC–VA–MD–WV Metropolitan Statistical Area (MSA) as defined by the United States Office of Management and Budget. This region includes Washington, DC; Calvert, Charles, Frederick, Montgomery and Prince George’s Counties in Maryland and Arlington, Clarke, Fairfax, Fauquier, Frederick, Loudon, Prince William, Spotsylvania, Stafford and Warrant Counties and the Cities of Alexandria, Fairfax, Falls Church, Fredericksburg, Manassas and Manassas Park in Virginia and Jefferson County in West Virginia.

Over the recent recession years of 2007 to 2009, Prince George’s County lost employment though at a slower rate than the nation, with the county losing 3.8% of its total employment and the nation losing 5.0% of total employment. Still the county’s loss of employment in the recession years were greater than for the region (2.4% decline) and for Maryland (3.4% decline).

Meanwhile, 13 of the 23 primary industry clusters in Prince George’s County lost employment over the 2001–2007 full business cycle period, and six other primary industry clusters grew more slowly than the nation. During the recent recession years of 2007 to 2009, a number of primary industry sectors grew in employment, including travel and tourism, biosciences, business consulting services, hospitals and health services, navigation and control instruments, federal government, software and computer services, and legal services.

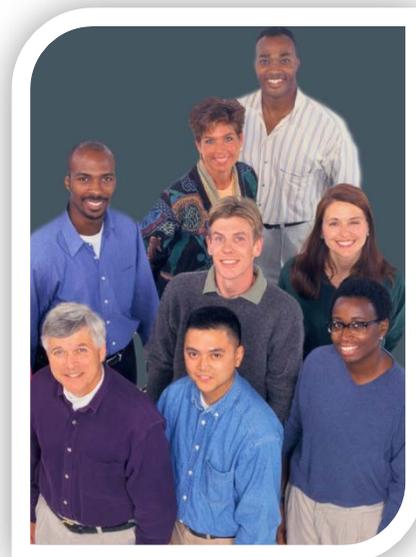
Table 2: Comparison of Employment Growth of Prince George’s County to Washington, D.C. Metropolitan Region, State of Maryland and U.S., 2001-07 (Full Business Cycle) and 2007-09 (Recession)

Geographic Area	Employment Growth, Total Employment (Public and Private)				Employment Growth, Total Private Sector			
	2001-2007 (Full Business Cycle)		2007-2009 (Recession)		2001-2007 (Full Business Cycle)		2007-2009 (Recession)	
	Change in Jobs	% Change	Change in Jobs	% Change	Change in Jobs	% Change	Change in Jobs	% Change
Prince George’s County	11,842	3.9%	-11,868	-3.8%	2,416	1.1%	-14,024	-6.0%
Washington, D.C. Metro Region	284,581	7.2%	-101,363	-2.4%	165,255	7.9%	-72,410	-3.2%
Maryland	125,452	5.2%	-86,242	-3.4%	105,357	5.3%	-101,869	-4.9%
United States	5,730,306	4.4%	-6,758,264	-5.0%	4,692,900	4.3%	-7,068,300	-6.2%

Source: Battelle analysis of Bureau of Labor Statistics Quarterly Census of Employment and Wages data from IMPLAN.

In the context of a lagging overall county economy, a closer examination of the 23 primary industry clusters suggests that there are many opportunities for targeting economic growth in the future based on the findings from the regional economic analysis.

- Two industry clusters are well positioned as current strengths, being specialized, growing in employment and gaining competitive share compared to the nation over the last full business cycle of 2001 to 2007:
 - Business support services
 - Navigation and controls
- Four industry clusters are promising targets for retention, because they are specialized in the region, despite lagging employment trends from 2001 to 2007, and growing in the region:
 - Construction



- Federal government
- Research, development and engineering services
- Software and computer services
- Six industry clusters are emerging strengths or opportunities, because they have been gaining employment in the county over the 2001 to 2007 full business cycle and two already stand as current strengths in the region:
 - Biosciences (a regional strength)
 - Business consulting services (a regional strength)
 - Communications and media equipment
 - Hospitals and health services
 - Strategic office centers
 - Travel and tourism

Of the 23 primary industry clusters, there were nine with limited growth prospects because they are not specialized, losing employment and not gaining competitive share over the 2001 to 2007 full business cycle period. These include: aerospace products and parts; big box retail; finance and insurance; legal; marketing and advertising; media services; semiconductors and electronic components; telecommunications services; and transportation, distribution and logistics. While not sufficient to be targeted for economic development services, the presence of these limited growth prospect primary industry clusters are still important from a workforce development perspective, because of job openings and leading employers found in the county. Data on the county's primary industry clusters are displayed in Table 3.

Table 3: Prince George County's 23 Primary Industry Clusters

Industry Clusters	Degree of Specialization, 2008 (LQ)	Employment Change, 2001–2007	Competitive Share Change, 2001–07	Target Assessment
Aerospace Products & Parts	0.51	-482	-38.9%	Limited Prospects
Big Box Retail	1.08	-528	-15.7%	Limited Prospects
Biosciences	0.42	63	-7.4%	Emerging Opportunity
Business Consulting Services	1.03	342	-5.3%	Emerging Opportunity
Business Support Services	1.89	3,098	35.1%	Current Strength
Communications & Media Equipment	0.59	1	43.6%	Emerging Strength
Computer & Peripheral Equipment	1.39	-62	25.6%	Additional Retention
Construction	2.22	3,030	-1.6%	Primary Retention
Finance & Insurance	0.59	-381	-10.9%	Limited Prospects
Hospitals and Health Services	0.71	941	-5.6%	Emerging Opportunity
Legal	0.59	-125	-14.8%	Limited Prospects
Marketing & Advertising	0.61	-283	-21.2%	Limited Prospects
Media Services	0.19	-2,463	-91.5%	Limited Prospects
Navigation & Control Instruments	1.66	551	107.6%	Current Strength
Research, Development & Engineering Services	1.58	-139	-9.3%	Additional Retention
Semiconductors & Electronic Components	0.03	-94	-35.1%	Limited Prospects
Software & Computer Services	2.65	-160	-2.9%	Additional Retention
Strategic Office Centers	0.70	213	0.2%	Emerging Strength
Telecommunications Services	1.08	-1,360	-5.8%	Limited Prospects
Traditional Print Media	1.30	-602	-6.4%	Additional Retention
Transportation, Distribution and Logistics	1.00	-2,321	-14.6%	Limited Prospects
Travel & Tourism	1.09	214	6.4%	Emerging Strength
Federal Government	3.96	-611	-1.4%	Additional Retention

Source: Battelle analysis of BLS QCEW data from IMPLAN.

Of particular consequence for the future economic development of Prince George’s County is the robustness of the overall region.³ It is important to consider the broader region because it represents a self-contained regional economy, as defined by commuting patterns, while Prince George’s County is just one jurisdiction within that regional economy. The opportunity is for Prince George’s County to position itself in the years ahead to gain a growing share of the region’s overall economic growth, particularly in specific industry clusters.

In particular, four of the retention industry clusters in Prince George’s County, which represent specialized industry clusters that are not growing in the county, have recorded strong growth across the region, and so present an opportunity for Prince George’s County to position itself for the future. These include software and computer services; research, development and engineering services; the federal government; and construction.

Also, among the emerging industry clusters found in Prince George’s County, several are already current strengths in the overall region, including biosciences and business consulting services. So, this suggests that Prince George’s County has an opportunity to continue to grow in these emerging industry clusters by positioning itself as a location site within the region.

One way to identify opportunity areas for the county is to look at those industry clusters that are growing in employment at the regional level. Table 4 identifies industry clusters that are current strengths (specialized and gaining competitive share), primary retention (specialized, but not gaining competitive share), or emerging strength (not specialized, but gaining competitive share) in the region, and compares them with how those industry clusters fared in the county.

Table 4: Primary Industry Cluster Comparison – Region vs. County

Industry Cluster	Region Level Target Assessment	Prince George’s County’s Share of Regional Employment (avg. of 7.4%)	Prince George’s County Target Assessment
Big Box Retail	Emerging Strength	12.4%	Limited Prospects
Biosciences	Current Strength	3.1%	Emerging Opportunity
Business Consulting Services	Current Strength	2.4%	Emerging Opportunity
Business Support Services	Current Strength	9.5%	Current Strength
Construction	Emerging Strength	19.1%	Primary Retention
Finance & Insurance	Emerging Strength	7.4%	Limited Prospects
Hospitals and Health Services	Emerging Strength	10.3%	Emerging Opportunity
Legal	Primary Retention	2.6%	Limited Prospects
Research, Development & Engineering Services	Primary Retention	7.2%	Additional Retention
Software & Computer Services	Current Strength	6.4%	Additional Retention
Strategic Office Centers	Emerging Strength	8.1%	Emerging Strength
Federal Government	Current Strength	7.3%	Additional Retention

Source: Battelle analysis of Bureau of Labor Statistics, Quarterly Census of Employment and Wages, data from IMPLAN.

³ The Battelle project team also considered an expanded metropolitan definition to include Howard County, Anne Arundel County, Baltimore County and Baltimore City. Upon analysis, there were no major differences in key regional analysis measures and so it was determined to stay with the standard definition of the metropolitan region since it is based on an official designation by the U.S. Census Bureau based on commuting patterns.

Core Competency Scan

Methodology

The previous chapter looked at the past performance of the county's industry clusters. Although recent economic performance offers valuable insights, it suffers from being a "backwards" looking approach. Industry clusters are dynamic and many advance in ways that break from past trends. One way to gain a more "forward looking" assessment of how well positioned an industry cluster is for future growth is to analyze its core competencies. This type of insight considers the level of "know-how" within the county's industry, universities, and national laboratories and how they relate to the primary industry clusters' future growth.

Identifying a county's core technology competencies or know-how involves identifying where there is a "critical mass" of activities across research and innovation measures. The concept of core competencies is now widely heralded by industry to advance competitive advantage. Gary Hamel and C.K. Prahalad in their landmark study, *Competing for the Future*, explain how a focus on core competencies can improve competitiveness:

"To successfully compete for the future a company must be capable of enlarging its opportunity horizon. This requires top management to conceive of the company as a portfolio of core competencies rather than a portfolio of individual business units... Core competencies are the gateways to future opportunities. Leadership in a core competence represents a potentiality that is released when imaginative new ways of exploiting that core competence are envisioned."⁴

From an economic development perspective, it is from core competencies present in industry, universities or federal labs that gaining a position in existing and emerging industries can best be realized by a locality. While there is no one single measure of core competency, three variables were considered to identify the county's core technology competencies:

- Patent activities of industry, universities and federal labs
- Presence of innovative, emerging companies
- Publications and major research centers found among universities and federal labs

Patent Activities in Prince George's County

Patents are a direct measure of core competencies and innovation potential. A patent represents the intellectual property being generated by companies, university faculty, and federal lab researchers, and so reflect the emphasis of their technology strengths.

Patents generated by inventors in Prince George's County from 2005 to 2009 were analyzed using patent classifications to see the representation of patents across the industry clusters. Ten of the 23 clusters had patents over this four year period, with the largest number found in biosciences and communications and media equipment. (See Table 5.)

⁴ Hamel and Prahalad, *Competing for the Future*, Harvard Business Press, 1994, pg 90 and 217.

Table 5: Distribution of Patents by Primary Industry Clusters in Prince George’s County

Industry Clusters	Patents Generated by Inventors in Prince George’s County 2005–2009
Aerospace Products & Parts	8
Biosciences	94
Communications & Media Equipment	90
Computer & Peripheral Equipment	35
Navigation & Control Instruments	22
Research, Development & Engineering Services	27
Semiconductors & Electronic Components	45
Software & Computer Services	47
Telecommunications Services	16
Transportation, Distribution and Logistics	11

Source: U.S. Patent & Trademark Office data as available from the Thomson Reuters’ Delphion Patent Analysis Database, 2005–2009.

Presence of Innovative, Emerging Companies

Another way to measure core competencies is to identify the presence of innovative companies. The presence of these innovative companies offers an important driver for future economic growth, because of their growth potential and the specialized know-how they bring to a local economy.

A number of sources to identify innovative companies were examined, including:

- **CorpTech:** A specialized database of technology companies, known as the CorpTech Directory, which examines more than 250 detailed technology classifications to learn the specific technology markets being served by the companies’ products and services. There were 129 companies in Prince George’s County listed in CorpTech, which controlled the employment of nearly 82,000 employees nationwide (note: CorpTech does not measure local employment, only national employment for companies listed).
- **Thompson Venture Xpert:** Thomson VentureXpert is a venture capital database provided by Thomson Economics. It was used to identify high-growth potential companies in the county that received formal venture capital investments and are still in operation. There were 27 venture capital-backed companies operating in the county as of the end of 2009.
- **Federal Small Business Innovation Research (SBIR) awardees database:** SBIR awards are awarded to small businesses (under 500 employees) by federal agencies to conduct R&D projects that appear to have commercial potential. The goal is to go from proof of concept to commercialization over different phases of funding by the federal agency. Twenty-one companies based in the county received SBIR awards over the 2007 to 2009 period.

Table 6 provides a crosswalk of CorpTech, venture capital-funded companies, and SBIR awardees by industry cluster. Overall, 14 of the 23 industry clusters have a presence of innovative companies based on the data sources analyzed.

Table 6: Distribution of Innovative, Emerging Companies across Primary Industry Clusters in Prince George’s County

Industry Clusters	CorpTech		Venture Capital Funded Companies	SBIR
	# of Firms	Employment Controlled	# of Firms	# of Firms
Aerospace Products & Parts	11	662	1	3
Big Box Retail			1	
Biosciences	10	1,076	4	1
Communications & Media Equipment	2	110	4	2
Computer & Peripheral Equipment	16	4,787	1	1
Construction	3	3,587	1	
Marketing & Advertising			1	
Media Services			1	
Navigation & Control Instruments	2	677		3
Research, Development & Engineering Services	10	1,466		3
Semiconductors & Electronic Components	2	38	5	4
Software & Computer Services	31	4,789	3	4
Strategic Office Centers	5	10,885		
Telecommunications Services	6	899	5	

Source: Battelle analysis of CorpTech, Thompson VentureXpert, and SBIR award data.

Publications and Research Centers Found Among Universities and Federal Labs in Prince George’s County

Another key source of know-how is the specific research strengths found across universities and federal labs present in Prince George’s County. The county enjoys the presence of five significant research drivers that include the University of Maryland, College Park (UMCP), Bowie State University (BSU), NASA Goddard Space Flight Center (NASA Goddard), the U.S. Department of Agriculture’s Beltsville Agricultural Research Center (USDA BARC), and the Army Research Lab.

For each of these research drivers, the peer-reviewed journal publications from 2007 to 2009 generated by the organization were considered. In addition, there were discussions held with officials involved in research activities at these research drivers, along with a review of their web pages. Fourteen out of the 23 industry clusters had some level of publications and/or research centers associated with them (see Table 7).

Table 7: Distribution of Publications and Research Centers by Primary Industry Clusters in Prince George’s County

Industry Clusters	Publications Research & Technology Institutions – Centers and Areas of Research Focus					
	# of Pubs	UMCP	# of Pubs	UMCP	# of Pubs	UMCP
Aerospace Products & Parts	2165	Center for Research and Exploration in Space Science & Technology; Constellation University Institutes Project; Institute for Dexterous Space Robotics; Earth System Interdisciplinary Center; Fire Monitoring; Epoxi; Space Vehicles Technology Institute; Space Systems Lab				
Biosciences	2768	Maryland Pathogen Research Institute; Center for Food Systems Security and Safety; Center for Bioinformatics and Computational Biology; Maryland Population Research Center; Center for Addictions, Personality and Emotion Research; Auditory Neuroethology Lab; Center for Comparative and Evolutionary Biology of Hearing; Neuroscience and Cognitive Sciences Program	Maryland Program Advancing Clinical Trials; National Cancer Institute’s Community Network Program; NCI Planning Grant on Cancer Health Disparities; University of Maryland School of Medicine Prostate Cancer Initiative		Animal & Natural Resources Institute; Human Nutrition Research Center; Plant Sciences Institute	
Communications & Media Equipment	318	The Laboratory for Telecommunications Sciences; Laboratory for Physical Sciences; Institute for Systems Research				Communications and Networks Collaborative Technology Alliance
Computer & Peripheral Equipment	72					
Construction	223					
Hospitals and Health Services	205	Public Health Informatics Laboratory				
Media Services	103					
Navigation & Control Instruments	249					
Research, Development & Engineering Services	1511	Joint Quantum Institute; Maryland NanoCenter; Plasma Mass Spectroscopy Lab		Space Instruments: Advanced Sensors & Detectors; Instrument Components		

Semiconductors & Electronic Components	661	Center for Applied Electromagnetics; Center for Advanced Life Cycle Engineering; University of Maryland Materials Research Science & Engineering Center; Institute for Research in Electronics and Applied Physics	Sensors and Electron Devices
Software & Computer Services	569	Institute for Advanced Computer Studies; Maryland Information and Network Dynamics Laboratory	Networks & Information Science International Technology Alliance
Telecommunications Services	160	The Institute for Systems Research; Center for Risk Communication Research	
Transportation, Distribution and Logistics	N/A	Transportation Center	
Federal Government	N/A	M Square Park (University of Maryland Research Park)—NOAA, FDA	

Source: Publications from Thomson Reuters Institute for Scientific Information, Battelle Analysis; Research Centers from Battelle review of web sites, published materials

Overall Assessment from Core Competency Scan for Prince George's County

Bringing together the three components—patent activity, presence of innovative companies, and publications and major research centers—provides a view of those industry clusters in which the county has broader drivers than simply recent economic trends in driving future economic growth. Table 8 sets out this more comprehensive view across the key components of the core competency scan, enabling an overall assessment of the presence of core competencies in the county.

What stands out is that there are six industry clusters with a significant level of core competencies found and another two industry clusters with a substantial level of core competencies:

- Primary industry clusters with a significant level of core competencies (rated highly in at least two or more core competency factors) includes:
 - Aerospace products and parts
 - Biosciences
 - Communications and media equipment
 - Research, development, and engineering
 - Semi-conductors and electronic components
 - Software and computer services
- Primary industry clusters in Prince George's County with a substantial level of core competencies (rating moderate to high in at least two core competency factors) include:
 - Computer and peripheral equipment
 - Navigation and control instruments

Table 8: Summary of Key Components of Core Competency Scan by Primary Industry Clusters in Prince George’s County

Industry Clusters	Core Competency Factors				Battelle Assessment of Core Competency Presence
	Patents XXX >50 XX>25 X > 0	SBIR, VC or CorpTech XXX>10 firms XX> 5 X>0	Publications XXX>500 XX>100 X> 0	Research Centers XXX > 3 XX>1 X>0	
Aerospace Products & Parts	X	XXX	XXX	XXX	Significant
Big Box Retail					n.a.
Biosciences	XXX	XXX	XXX	XXX	Significant
Business Consulting Services					n.a.
Business Support Services					n.a.
Communications & Media Equipment	XXX	XX	XX	XXX	Significant
Computer & Peripheral Equipment	XX	XXX	X		Substantial
Construction		X	XX		Limited
Finance & Insurance					n.a.
Hospitals and Health Services			XX	X	Limited
Legal					n.a.
Marketing & Advertising			XX		Limited
Media Services			XX		Limited
Navigation & Control Instruments	XX	X	XX		Substantial
Research, Development & Engineering Services	XX	XXX	XXX	XXX	Significant
Semiconductors & Electronic Components	XX	XXX	XXX	XXX	Significant
Software & Computer Services	XX	XXX	XXX	XXX	Significant
Strategic Office Centers					n.a.
Telecommunications Services	X	XXX		XX	Limited
Traditional Print Media					n.a.
Transportation, Distribution and Logistics	X				Limited
Travel & Tourism					n.a.
Federal Government				X	Limited

Note: n.a. is set out for those industry clusters that are typically less technology and more services oriented with few patent classifications or publication fields or companies receiving venture capital or SBIR grants.

Likely Growth Scenarios for the Primary Industry Clusters in Prince George's County

Methodology

The development of scenarios for estimating likely employment growth is a critical input for projecting future occupational demands. Future industry growth is a standard building block in occupational forecasting used by the U.S. Department of Labor and each state's Labor Market Information office. Since every industry cluster has its own specific mix of occupations, it is critical to start with an understanding of how likely development scenarios of each industry cluster will advance when considering overall occupational demands for Prince George's County out to the year 2020.

The approach used in determining the likely growth scenarios for each economic base industry cluster involved two key steps:

- **Step One:** Defining a set of standard "possible" industry cluster growth scenarios that can be calculated in a uniform manner across industry clusters. This standard set of potential growth scenarios are informed by the national context of expected future employment growth for each industry cluster as projected by the U.S. Bureau of Labor Statistics (BLS), past performance of each industry cluster, and the potential for accelerated growth for the industry cluster based on the region's position.
- **Step Two:** Applying the results of the regional economic analysis and core competency scan for each primary industry cluster to identify what are the best fits from among the set of possible industry cluster growth scenarios for a "low" and "high" growth scenario level.

Standard Set of Possible Growth Scenarios

While there is no fixed "low" and "high" growth scenario that can be applied across all of the primary industry clusters in the county, there are standardized methods for determining possible growth scenarios that can be developed for each industry cluster. Three broad approaches were identified that encompass a total of five standardized growth scenarios for each industry cluster.

National Context Growth Scenario

One straight-forward possible growth scenario is for an industry cluster to grow at the expected national average annual growth rate. This scenario is certainly a baseline approach that might fit either a likely "low" scenario or a likely "high" scenario, depending upon the recent employment trends of an industry cluster in the county relative to the nation. For instance, the national projected growth rate might be a likely "low" scenario for a particular industry cluster if the county has been outpacing the national average employment growth over the past business cycle. Alternatively, the national projected growth rate might constitute a likely "high" scenario for a particular industry cluster if the county has been lagging the national average employment growth over the past business cycle.

The long-term industry employment projections of national average annual employment growth developed by BLS was used as the measure of national performance. Beginning more than 60 years ago, BLS started developing long-term employment projections to provide career information to veterans reentering the civilian workforce after World War II. Today, the ten-year, long-term industry employment forecast has been a widely utilized tool for career guidance, educational and training program planning,

and studying long-range employment trends. It is prepared every two years by BLS.⁵ The most recent period for which projections are available is for 2008 to 2018.

To prepare this long-term employment projection, BLS has developed a very detailed methodology. In brief, the BLS uses the Macroeconomic Advisers econometric model of the U.S. economy to derive estimates of the components of the gross domestic product (GDP). These estimates are then disaggregated into commodity-level demand, which is then applied to an input-output model to derive output by industry. Next, industry-level employment is determined on the basis of projected industry output and expectations of productivity growth, which incorporates expected technological changes.

Table 9 provides a calculation of the BLS industry projections applied to the primary industry clusters found in the county. Each of the detailed industries found in each industry cluster was mapped to the corresponding industry forecast associated with the corresponding BLS projection. This results in having an industry cluster that reflects the composition of each industry cluster found in Prince George's County. In cases where the county's industries were at a more detailed industry level than projected by BLS, it was assumed that the more detailed industries would grow at the same rate as the higher-level industry cluster of which they are a part.⁶ BLS does not project federal government employment since it is based on federal budget levels and staffing patterns, which fall outside of BLS' focus and its economic forecasting tools.

⁵ Please see the news release by the U.S. Bureau of Labor Statistics on its 2008–2018 forecast. For a detailed article on the industry employment projections, see Kristina J. Bartsch, "The Employment Projections for 2008–2018," *Monthly Labor Review*, November 2009, <http://www.bls.gov/opub/mlr/2009/11/art1full.pdf>

⁶ Battelle defined the Prince George's County industry clusters at the 6 digit NAICS codes, while U.S. BLS projections go only to the 4 digit NAICS code. So for all 6 digit NAICS codes, Battelle applied the corresponding 4 digit NAICS codes growth projections from the U.S. BLS.

Table 9: Industry Cluster Average Annual Employment Growth Rate Based on BLS 2008–2018 Projections of Detailed Industry Growth

Industry Cluster	Average Annual Employment Growth Rate, 2008–2018 Projections
Aerospace Products & Parts	0.0%
Big Box Retail	0.4%
Biosciences	2.6%
Business Consulting Services	8.1%
Business Support Services	2.0%
Communications & Media Equipment	-0.7%
Computer & Peripheral Equipment	-3.1%
Construction	1.8%
Finance & Insurance	0.5%
Hospitals and Health Services	1.9%
Legal	2.2%
Marketing & Advertising	1.7%
Media Services	0.9%
Navigation & Control Instruments	-0.2%
Research, Development & Engineering Services	2.2%
Semiconductors & Electronic Components	-3.4%
Software & Computer Services	4.5%
Strategic Office Centers	0.7%
Telecommunications Services	-0.8%
Traditional Print Media	-1.7%
Transportation, Distribution and Logistics	0.7%
Travel & Tourism	0.6%
Federal Government	N/A

Source: US Bureau of Labor Statistics, please see Kristina J. Bartsch, “The Employment Projections for 2008–2018,” Monthly Labor Review, November 2009, calculations by Battelle

Past Performance Growth Scenario

Another approach for calculating employment growth is to focus on the past performance of the county’s industry clusters over the last business cycle from 2001 to 2007. This past performance reflects the most current intelligence we have of actual trends. Looking over the last business cycle ensures that we are considering a substantial long-term perspective that measures consistent economic points over time.

There are two ways to consider past performance. One very simple approach is to use the actual average annual percentage change recorded by an industry cluster over the 2001 to 2007 period. The advantage of this approach is that it reflects the most recent actual economic performance of the county. While this is a very straight forward approach, it fails to consider the national context of how an industry cluster is expected to fare nationally.

An alternative approach for measuring past performance that does integrate the expected national context is to examine the relative growth of an industry cluster in the county to that industry cluster’s growth nationally, and then apply against the projected annual average growth rate from the recent BLS projections for that industry cluster. A key advantage of the relative growth approach is that it brings an informed logic of whether the county outgrew or lagged U.S. growth in its most recent economic performance to assessing the potential of projected national growth rates.

The relative growth rate was calculated using the differences in the average annual growth rates between Prince George's County and the U.S. for an industry cluster over the 2001–2007, and then applying that difference against the projected annual average growth rates from BLS. This use of relative differences in growth rates was used as opposed to comparing average annual percentage growth rates of Prince George's County to the U.S. for an industry cluster because in too many industry clusters either the county or the U.S., or both, declined in employment. On a mathematical basis, having a negative percentage change makes it difficult to calculate a meaningful relative growth rate based on average annual percentage changes, even when both the county and the U.S. declined in employment.

Table 10 presents the two past performance ways to calculate employment growth scenarios for each industry cluster. For the federal government, a relative growth rate was not projected since there is no BLS forecast for federal employment, but a calculation of actual past performance of the county was completed.

Table 10: Growth Rates for Primary Industry Clusters in Prince George’s County Based on Past Performance Measures

Industry Cluster	Past Performance of Prince George’s County	
	Difference of Average Annual Change of Prince George’s County to the US, 2001–2007 Applied to BLS Projected Average Annual Growth Rates	County’s Average Annual Rate of Growth for 2001–2007 Time Period
Aerospace Products & Parts	-6.49%	-7.1%
Big Box Retail	-2.21%	-0.7%
Biosciences	1.37%	1.1%
Business Consulting Services	7.22%	3.3%
Business Support Services	7.85%	8.5%
Communications & Media Equipment	6.59%	0.1%
Computer & Peripheral Equipment	1.21%	-1.7%
Construction	1.57%	1.7%
Finance & Insurance	-1.31%	-0.8%
Hospitals and Health Services	1.00%	1.4%
Legal	-0.28%	-1.5%
Marketing & Advertising	-1.82%	-4.2%
Media Services	-14.40%	-15.3%
Navigation & Control Instruments	17.73%	16.3%
Research, Development & Engineering Services	0.67%	-0.6%
Semiconductors & Electronic Components	-9.21%	-10.9%
Software & Computer Services	3.98%	-0.3%
Strategic Office Centers	0.74%	1.3%
Telecommunications Services	-1.81%	-5.4%
Traditional Print Media	-2.77%	-3.6%
Transportation, Distribution and Logistics	-1.79%	-1.7%
Travel & Tourism	1.67%	1.0%
Federal Government	n/a	-0.6%

Source: Battelle calculations based on IMPLAN data and use of U.S. Bureau of Labor Statistics Employment Forecast, please see Kristina J. Bartsch, “The Employment Projections for 2008–2018,” Monthly Labor Review, November 2009

Accelerated Growth Potential

The accelerated growth potential scenario reflects the fact that for nearly every primary industry cluster, the county under-performed the region. More specifically, for nearly every primary industry cluster, either the county grew at a slower rate of employment growth than the region, and/or the presence of the industry cluster in the county was lower than in the region. The only exceptions were for two smaller industry clusters, namely the navigation and control instruments industry cluster (where the county grew while the region declined and the county is specialized and the region is not) and the aerospace products and parts industry cluster (which declined in both the county and region, but faster in the region, and the county has a higher presence but is not specialized). This accelerated growth potential scenario is particularly important for those industry clusters in which the county has core technology competencies. It is these clusters that can help propel the county forward to capture the higher growth being recorded across the region.

There are two ways used to calculate the accelerated growth scenario. One is to have the county grow at the region’s rate of growth. The relative growth measure described above in the past performance section

is utilized since it combines the relative growth rates of the region to the nation as well as the national context of projected industry growth over time. As a reminder, this relative growth is measured by the differences in the average annual growth rates between the region and the U.S. and then applying that difference against the projected annual average growth rates from BLS.

An alternative accelerated growth scenario would be for the county to “catch up” with the region’s level of specialization, as measured by its location quotient. This catch-up only applies to those 17 industry clusters in which the county is below the level of specialization found in the region.

Table 11 presents both ways to calculate accelerated growth for each industry cluster.

Table 11: Growth Rates for Primary Industry Clusters in Prince George’s County Based on Accelerated Growth Measures

Industry Cluster	Past Performance of Prince George’s County	
	Difference of Average Annual Change of Prince George’s County to the US, 2001–2007 applied to BLS Projected Average Annual Growth Rates	Region’s 2001–2007 Average Annual Rate of Growth
Aerospace Products & Parts	-10.23%	n/a
Big Box Retail	0.87%	n/a
Biosciences	7.00%	30.36%
Business Consulting Services	9.76%	36.11%
Business Support Services	3.24%	1.03%
Communications & Media Equipment	4.11%	26.57%
Computer & Peripheral Equipment	-2.94%	n/a
Construction	1.89%	n/a
Finance & Insurance	0.82%	4.73%
Hospitals and Health Services	2.18%	0.51%
Legal	1.55%	34.14%
Marketing & Advertising	0.78%	6.20%
Media Services	-0.63%	52.13%
Navigation & Control Instruments	-7.48%	n/a
Research, Development & Engineering Services	1.95%	4.65%
Semiconductors & Electronic Components	0.50%	45.99%
Software & Computer Services	6.71%	7.75%
Strategic Office Centers	3.96%	4.70%
Telecommunications Services	-2.73%	6.40%
Traditional Print Media	-2.70%	2.09%
Transportation, Distribution and Logistics	-1.07%	n/a
Travel & Tourism	7.73%	3.83%
Federal Government	1.06%	5.37%

Source: Battelle calculations based on IMPLAN data and use of U.S. Bureau of Labor Statistics Employment Forecast, please see Kristina J. Bartsch, “The Employment Projections for 2008–2018,” Monthly Labor Review, November 2009

Applying the Best Fits of Possible Growth Scenarios for Each Industry Cluster

The next step for estimating likely growth scenarios for each industry cluster is identifying which of the standard scenarios is the best fit as the likely high- or low-growth rate. A close examination of the results of the standard scenarios makes it clear that there is no fixed approach in selecting the best fit for a high- or low-growth scenario across all of the clusters. This reflects the fact that there is considerable variation for how each industry cluster is expected to grow nationally, how each industry cluster in the county performed over the last business cycle, and how the region is positioned.

Selecting the best growth scenario fit for each industry cluster must be undertaken individually. The key factors shaping how to select the best fit are to consider:

- The regional economic analysis for each industry cluster in the county over the 2001–2007 business cycle.
- Whether there is a presence of core technology and innovation competencies for each industry cluster.
- How an industry cluster is positioned more broadly across the region.

Even taking these factors into consideration, the selection of the best growth scenario requires a cluster-by-cluster analysis.

Table 12 sets out the assessment for each primary industry cluster of the likely growth scenarios.

Table 12: Industry Cluster Growth Scenarios

	Aerospace	Big Box Retail	Biosciences	Business Consulting Services
County Industry Target Assessment	Limited	Limited	Emerging Opportunity	Emerging Opportunity
County Core Competency Assessment	Significant	No Presence	Significant	No Presence
Regional Industry Assessment	Limited	Emerging Strengths	Current Strength	Current Strength
Discussion	Not a growth industry nationally and both county and region have performed poorly, so despite core competencies continued limited prospects.	Not a growth industry nationally or county competency. The region did outpace in past performance, but no reason to see county gaining especially with lagging population growth.	Fast growing industry nationally with strong regional presence and emerging position and significant core competencies in county, though industry cluster is small in the county.	Particularly strong national growth is projected—highest of any industry cluster. While no local-based competency drivers, the county recorded past performance and the region even stronger.
High	0% (national growth rate)	0.4% (national growth rate)	30.36% (reach regional level of concentration)	8.1% (national growth rate)
Low	-6.5% (relative county past performance)	0%	2.6% (national growth rate)	3.3% (past county performance)

	Business Support Services	Communications & Media Equipment	Computer & Peripheral Equipment	Construction
County Industry Target Assessment	Current Strength	Emerging Strength	Additional Retention	Primary Retention
County Core Competency Assessment	No Presence	Significant	Substantial	Limited
Regional Industry Target Assessment	Current Strength	Additional Retention	Limited Prospects	Emerging Strength
Discussion	Past experience combined with fact that it is still a growth industry suggests, solid growth for the county	Expected to decline nationally, but county has significant competency drivers and Region has a high concentration—opportunity to shift employment regionally.	Strong expected declines nationally, declined in the region over 2001 to 2007 and limited presence regionally suggests not strong prospects	Health national growth with good past growth for the county and even stronger growth for the region.
High	8.5% (past county growth rate)	26.6% (reach region level of concentration)	-1.7% (past county experience)	1.9% (reach region relative growth level)
Low	2.0% (projected national growth rate)	0.5% (past county performance)	-3.1% (projected national growth rate)	1.7% (past county experience)

	Finance & Insurance	Hospitals & Health Services	Legal	Marketing & Advertising
County Industry Target Assessment	Limited Prospects	Emerging Opportunity	Limited Prospects	Limited Prospects
County Core Competency Assessment	No Presence	Limited	No Presence	Limited
Regional Industry Target Assessment	Emerging Strengths	Emerging Strengths	Primary Retention	Limited Prospects
Discussion	Minimal expected national growth and declined in county during heyday of industry cluster.	Healthy projected national growth and county grew strongly though below U.S. from 2001–2007.	Healthy projected national growth, but from 2001 to 2007 declined in the county and below national levels for the region.	While projected to grow nationally, neither the county nor region fared well—and limited competency drivers for county.
High	0.5% (projected national growth rate)	2.18% (reach relative growth of region)	2.2% (projected national growth rate)	1.7% (projected national growth rate)
Low	-0.8% (past county experience)	1.4% (past county experience)	-1.5% (past county experience)	-1.82% (relative county past experience)

	Media Services	Navigation & Control Instruments	R&D and Engineering Services	Semi-conductors & Electronic Components
County Industry Target Assessment	Limited Prospects	Current Strength	Additional Retention	Limited Prospects
County Core Competency Assessment	Limited	Substantial	Significant	Significant
Regional Industry Target Assessment	Limited Prospects	Limited Prospects	Primary Retention	Limited Prospects
Discussion	Projected to grow nationally, but significant declines in the past for region and especially for county	Projected to slightly decline nationally, but hefty growth for county with substantial competency drivers but not a key industry cluster for region	Healthy projected growth at the national level—both county and region lagged past national growth but have legacy strengths with significant competency drivers for the county	Despite significant competency strengths, not a strong industry cluster presence for the county or region. Steep declines expected nationally.
High	0.9% (projected national growth rate)	16.3% (past county experience)	4.65% (reach region level of concentration)	0.5% (relative region past experience)
Low	-0.63% (relative region past experience)	-0.2 (projected national growth rate)	2.2% (projected national growth rate)	-3.4% (projected national growth rate)

	Software & Computer Services	Strategic Office Centers	Telecommunications Services	Traditional Print Media
County Industry Target Assessment	Additional Retention	Emerging Strength	Limited Prospects	Additional Retention
County Core Competency Assessment	Significant	No Presence	Limited	No Presence
Regional Industry Target Assessment	Current Strength	Emerging Strength	Additional Retention	Additional Retention
Discussion	Very strong projected national growth, with strong regional presence and legacy strength for county with significant competency drivers—but county did decline in jobs from 2001-2007.	Projected slow growth at the national level, but both county and region have been outpacing national growth from 2001-2007.	Expected to decline nationally and not strong presence in the county.	Expected major declines projected nationally, and from 2001-2007 both county and region declined more than nation.
High	6.71% (relative region past growth)	4.7% (reach regional level of concentration)	-0.8% (projected national growth rate)	-1.7% (projected national growth rate)
Low	3.98% (relative county past performance)	0.7% (projected national growth rate)	-1.81% (relative county past performance)	-2.8% (relative county past performance)

	Transportation, Distribution & Logistics	Travel & Tourism	Federal Government
County Industry Target Assessment	Limited Prospects	Emerging Strength	Additional Retention
County Core Competency Assessment	Limited	No Presence	Limited
Regional Industry Target Assessment	Limited Prospects	Emerging Strength	Current Strength
Discussion	Slow growth projected at the national level and both county and region declined in jobs from 2001–2007 while nation grew.	Projected slow growth at the national level, but both county and region have been outpacing national growth from 2001-2007.	No national projections, but declined slightly for nation in past. Also declined for county from 2001–2007, but increased in the region. Both county and region have industry specializations.
High	0.7% (projected national growth rate)	7.73% (reach relative region past experience)	5.37% (reach region's concentration level)
Low	-1.7% (past county experience)	0.6% (projected national growth rate)	-0.6% (past county experience)

Translating Likely Growth Scenarios into Occupational Demand across the Primary Industry Clusters

Methodology for Translating Industry Growth Scenarios into Occupational Demand

With the high- and low-growth scenarios for each primary industry cluster estimated, it is now possible to generate occupational forecasts. The approach used by BLS was mirrored by applying industry growth to an employment matrix of how occupations are distributed by industry to determine how gains in industry employment relate to the growth of occupations. These include a base-year employment matrix for 2008 and a projected-year employment matrix for 2018, the most recent data that are available. These matrices, referred to collectively as the National Employment Matrix, constitute a comprehensive employment database. For each occupation, the matrix provides a detailed breakdown of employment by industry. Similarly, for each industry, the matrix provides a detailed breakdown of occupational employment.⁷

BLS derives its staffing pattern matrix of occupations by industry from employer surveys and additional original research. Using a state-and area-stratified employer sample, BLS contracts with states and jurisdictions to query firms concerning the numbers and types of workers they employ. The results are tabulated for each state and its areas and rolled up to national totals. Some survey results are available at the state and local area level. However, staffing patterns by industry are only widely available at the national level. Maryland is not among the handful of states that produce and publish state staffing patterns by industry.

Looking out to the future, it is also important to consider how staffing patterns may change over time due to technology and market drivers. For the 2008 to 2018 period, BLS has completed extensive research on likely future changes in occupational staffing patterns and relates the information to specific industries. Among the various factors that can affect the utilization of workers in an occupation in particular industries are technology, business practices, the mix of goods and services produced, the size of business establishments, and outsourcing (including off-shore sites). BLS staff analyzes each occupation in the matrix to identify the factors that are likely to cause an increase or decrease in utilization of that occupation within particular industries. Their analyses incorporate judgments about new trends that may influence occupational utilization, such as the use of the internet and electronic commerce. Once these factors are identified, change factors are developed which give the proportional change in an occupation's share of industry employment over the 10-year projection period.

If an occupation is found to be trending toward more or less importance relative to other occupations in an industry, BLS uses a "change factor" process to adjust the occupation's share of industry employment for the future period. These change factors in occupational utilization identified by BLS are incorporated into a revised 2018 occupation staffing matrix by industry, which are utilized to translate industry growth into occupations.

⁷ See http://www.bls.gov/emp/ep_projections_methods.htm for more details from BLS on its methodology.

Examples of change factors in occupational utilization for computer- related occupations include the following:

- A moderate decrease across all industries for Computer Programmers is anticipated as programming functions are increasingly automated and outsourced overseas, reducing demand for these workers.
- A more mixed utilization of Computer Support Specialists is expected. Specifically, a small increase in utilization in more “pure play” information technology (IT) industries such as data processing, hosting, and related services and computer design services is anticipated as these IT organizations will require more people as they increase their support service offerings. At the same time, non-IT industries will decrease their use of computer support specialists as support services are outsourced.
- Network Systems and Data Communications Analysts all industries, except management of companies and enterprises, are expected to experience a large increase as organizations continue to adopt the latest network technologies.

Appendix B provides a high level understanding of the shifts expected from occupational utilization changes identified by BLS from 2008 to 2018.

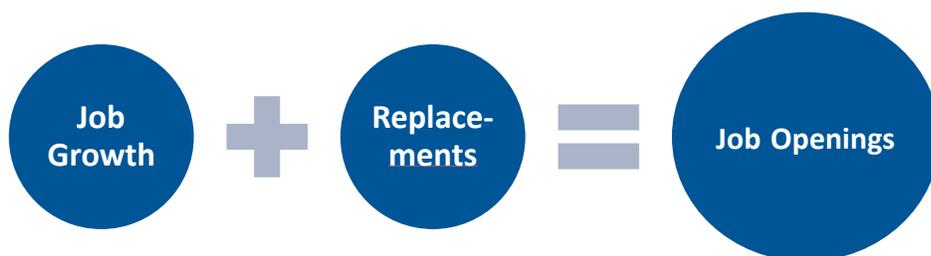
Job Growth vs. Job Openings

A more “economic development” oriented measure of change in occupations is the change in the total number of jobs—or job growth—within a specific occupational group over time. This job growth measure is important in tracking how the economy is progressing. It is also important in determining whether there are more high-skilled jobs or lower-skilled jobs, and can be used to identify the specific skills needed in the economy, such as information technology, business, or biosciences.

But from a “workforce” perspective, the growth in the total number of jobs does not fully reflect the demand for workforce by employers since many workers leave occupations because of retirement or because they change occupations. Consequently, employers have a need for replacement workers in addition to workers for any new jobs that are created. In many cases, the demand for workers due to the need for job replacements within an occupation well outpace the change in total number of workers or job growth in an occupation.

So, the full measure of labor demand is best calculated by adding together both the job growth in total employment in the occupations along with the need for replacement workers—which is commonly referred to as job openings. Figure 2 presents a simple graphic explaining how to calculate job openings.

Figure 2: Depiction of How Job Growth and Job Replacements Relate to Job Openings



Results of Job Growth Across Primary Industry Clusters for Prince George's County

The BLS employment matrix for 2018 was aggregated from the detailed industry level to the industry cluster groupings to determine the change in occupations within each industry cluster. The results were summarized using the two-digit level standard occupational classification codes because they offer an easier means to consider key job skills, while representing the breadth of occupational mix found in the workforce. This two-digit level of standard occupational classification is also closely linked to the only level of occupational detail available for Prince George's County from available data sources.

In terms of growth of jobs in occupational groups, a number of key findings stand out:

- Under both the industry low-growth and high-growth scenarios, a number of major occupational groupings, representing a mix of high- and low-skilled occupational groups, stand to increase at a higher growth rate than overall growth in the county's primary industry clusters, including:
 - Computer and mathematical science occupations (high-skilled)
 - Business and financial operations occupations (high-skilled)
 - Protective service occupations (low-skilled)
 - Building and grounds cleaning and maintenance occupations (low-skilled)
 - Personal care and service (low-skilled)
- Other fast growing occupational groups under the low-growth scenario are generally lower skilled occupational groupings, including:
 - Construction and extraction occupations
 - Installation, maintenance and repair occupations
 - Health care support occupations
 - Community and social services occupations
 - Healthcare practitioners and technical occupations
- Other fast growing occupational groups under the high-growth scenario are generally higher skilled occupational groupings, including:
 - Engineering and architecture occupations
 - Life, physical and social scientists occupations
 - Education, training and library occupations
 - Management occupations



So, the pattern in job growth across major occupational groups suggests that there are clear distinctions in the skill level of jobs between the industry low-growth and high-growth scenarios. This suggests that targeted economic development strategies focusing on the primary industry clusters with higher skill levels, such as biosciences, management consulting, and federal government can make an important difference in how occupations grow in the county. Table 13 shows projected job growth by occupations under the low- and high-growth scenarios.

Table 13: Growth in Occupations Across Primary Industry Clusters in Prince George's County, 2008–2020, Based on Low- and High-Growth Scenarios

Jobs By Summary Occupation	2008 Employment	2020 Employment Estimate		Change in Jobs from 2008–2020		Percentage Change in Jobs from 2008–2020	
		Low	High	Low Estimate	High Estimate	Low Estimate	High Estimate
Total	128993.4	144545.1	194841.7	15551.7	65848.3	12.1%	51.0%
Management	7085.3	7871.7	11198.6	786.4	4113.2	11.1%	58.1%
Business and Financial Operations	7710.1	8781.3	12878.0	1071.3	5167.9	13.9%	67.0%
Computer and Mathematical Science Occupations	8872.7	11597.3	15749.1	2724.6	6876.4	30.7%	77.5%
Architecture and Engineering	4567.3	5060.0	7940.5	492.7	3373.2	10.8%	73.9%
Life, Physical, and Social Science	4068.9	4266.5	7642.4	197.5	3573.5	4.9%	87.8%
Community and Social Services	959.1	1078.3	1256.0	119.2	296.9	12.4%	31.0%
Legal	945.7	841.5	1316.1	-104.3	370.4	-11.0%	39.2%
Education, training, and library	315.6	319.2	519.4	3.6	203.8	1.2%	64.6%
Arts, Design, Entertainment, Sports, and Media	1260.8	1288.2	1437.4	27.4	176.7	2.2%	14.0%
Healthcare Practitioners and Technical	5008.2	5777.4	6912.2	769.3	1904.0	15.4%	38.0%
Health Care Support	3091.5	3670.3	4157.0	578.7	1065.5	18.7%	34.5%
Protective Service Occupations	3602.7	4371.5	7101.1	768.9	3498.4	21.3%	97.1%
Food Preparation	2789.8	3048.9	4969.6	259.1	2179.9	9.3%	78.1%
Building and Grounds Cleaning & Maintenance	5637.0	6429.5	10557.0	792.5	4920.0	14.1%	87.3%
Personal Care and Service	1526.8	1759.6	2647.1	232.8	1120.3	15.3%	73.4%
Sales and Related Occupations	11924.6	12340.0	15397.2	415.4	3472.6	3.5%	29.1%
Office and Administrative Support Occupations	21585.8	22472.5	31479.5	886.7	9893.7	4.1%	45.8%
Farming, Fishing & Forestry	428.0	298.6	360.0	-129.4	-68.0	-30.2%	-15.9%
Construction and Extraction Occupations	21210.3	25699.6	26532.3	4489.3	5322.0	21.2%	25.1%
Installation, Maintenance, and Repair Occupations	5433.6	6404.3	7640.9	970.7	2207.3	17.9%	40.6%
Production Occupations	2741.0	2477.3	4161.9	-263.7	1420.8	-9.6%	51.8%
Transportation and Material Moving Occupations	2916.9	3079.6	3996.4	162.7	1079.5	5.6%	37.0%
Unallocated	5311.7	5611.9	8992.0	300.2	3680.3	5.7%	69.3%

Source: Battelle calculations based on application of scenarios to National Employment Matrix (see text for methodology)

Note: Unallocated values reflect incomplete distribution of industry employment by the occupational staffing patterns that are available from the Bureau of Labor Statistics. Due to confidentiality, rounding, suppression and other publication standards, the BLS occupational staffing patterns cover about 80% to 98% of all occupations in an industry. Average coverage is in the 96% to 98% range.

Results of Job Openings in Primary Industry Clusters for Prince George's County

Adding to the growth in total jobs within occupations was the extent of expected replacement needs based on estimates from the BLS on an occupation by occupation basis. To develop these estimates of replacements, the BLS develops historical replacement rates by occupation through an analysis of the Current Population Survey. The survey provides demographic and employment information about individuals in order to examine both the age profile of the occupation as well as the retention rate of workers within the occupational classification.

Factoring into account replacement needs as estimated by BLS, a calculation of the estimated annual average openings over the 2008 to 2020 period was made for each of the major occupational groupings, presented in the Table 14.

Table 14: Average Annual Change in Job Openings for 2008–2020 for Primary Industry Clusters in Prince George's County

All Primary Clusters	Average Annual Change in Job Openings from 2008 to 2020	
	Low Estimate	High Estimate
Jobs By Summary Occupation		
Total	4,077	7,348
Management	247	487
Business and Financial Operations	260	573
Computer and Mathematical Science Occupations	400	728
Architecture and Engineering	163	380
Life, Physical, and Social Science	162	429
Community and Social Services	32	46
Legal	17	46
Education, Training, and Library	8	22
Arts, Design, Entertainment, Sports, and Media	45	75
Healthcare Practitioners and Technical	169	261
Health Care Support	81	120
Protective Service Occupations	139	354
Food Preparation	57	141
Building and Grounds Cleaning & Maintenance	146	408
Personal Care and Service	37	78
Sales and Related Occupations	377	588
Office and Administrative Support Occupations	624	1192
Farming, Fishing & Forestry	9	11
Construction and Extraction Occupations	756	822
Installation, Maintenance, and Repair Occupations	200	276
Production Occupations	62	169
Transportation and Material Moving Occupations	86	142

Source: Battelle.

The job openings data reveals far more consistency in the leading occupational groups when replacement needs are considered than when just new jobs related to industry growth are considered. The same five occupational groups have the highest level of average annual job openings across the county's primary industry clusters whether under the industry low-growth scenario or high-growth scenario (though not necessarily in the same order), namely:

- Construction and extraction occupations
- Office and administrative support occupations
- Computer and mathematical science occupations
- Sales and related occupations
- Business and financial operations

The Workforce Pipeline in Prince George's County: Its Current Capacity and How it Aligns with the Needs of Its Primary Industry Clusters

Methodology

A core goal of this study is to analyze the supply of a skilled workforce in the context of the occupational needs of the county's primary industry. The standard approach to assessing labor supply versus labor demand compares degrees and certificates awarded by a locality's educational and training providers to projected demands detailed from the occupational forecast.

Several caveats or limitations must be understood with this analysis. One limitation is that a crosswalk of degrees to occupations cannot capture graduates that enter a much different line of work. An example of this is when a worker with an engineering degree decides to take a position in sales or general management. Another limitation is that there are significant skill differences across positions within occupational groupings that are not able to be analyzed at the county level. For instance, computer occupations include both high-skilled database administrators and applications developers, along with lower-skilled positions such as computer programming and network management. Similarly, there are wide differences in the skills of graduates within a single field, with master's and doctorate-level degrees being much higher skilled than associate- or bachelor-level degrees. Finally, this analysis makes comparisons using only the final degree granted, while many jobs, even in highly technical areas, are filled by graduates who have completed significant amounts of coursework in a given field not within their final degree granted.

Most importantly, it is critical to underscore that not all graduates from institutions in Prince George's County will remain in the county following graduation or completion of a formal credential. However, these graduates do represent a primary potential source of talent to fill both new and replacement jobs—the opportunity for the county's talent pipeline to align with labor demand.

So the supply—or pipeline—of workers generated from the county's post-secondary education system, workforce development training programs, and apprenticeship training programs was compiled using available data on enrollment and graduation. At the post-secondary level, data was used from the Maryland Higher Education Commission (MHEC) on the enrollment and graduation of post secondary institutions located in Prince George's County, across all types of certificates, associate degrees, bachelor's degrees, master's degrees, and PhD's.⁸ From MHEC, data on enrollment in private career schools in the county for 2008 was obtained, and an estimate of graduates was made using statewide averages. Similarly, data on formal workforce training programs was obtained from the Prince George's County Workforce Investment Board (WIB), and data on apprenticeships generated in the county was obtained from the Associated Builders and Contractors' Training Trust.

These certificate, degree, training, and apprenticeship programs were then cross walked into the specific occupational groupings, in order to develop a broad sense of the potential labor pool being generated each year by occupations. The results are presented in Table 15.

⁸ The Maryland Higher Education Commission provided the Jacob France Institute with raw enrollment and degrees granted by institution for 2008 and partial data for 2009, which was analyzed by the Institute.

Table 15: Alignment of Graduates at Different Levels by Occupational Groupings for 2009

Major Occupational Group	Private Career School (est.)	WIB Training Activities	Certificates, All Types	Associate's	Bachelor's	Master's	Doctorate	Doctorate Professional Practice	Total, All Degrees & Certificates
HIGHER-SKILLED OCCUPATIONS									
Arts, Design, Entertainment Media			1	10	290	15	4		320
Business & Financial Operations		27	13	20	1,183	14	7		1,264
Community & Social Services			1		170	195	8		374
Computer & Math Science Occupations	173	55	64	45	336	307	59		1,039
Education, Training & Library		1	10	26	235	532	68		872
Engineering & Architecture			22	20	663	322	115		1,142
Healthcare Practitioners & Technical			80	193	107	51	21	40	492
Legal			7	13					20
Life, Physical & Social Sciences			3		1,906	165	169		2,243
Management				100	228	692	9	0	1,029
Protective Service Occupations			25	14	447	26	9		521
LOWER-SKILLED OCCUPATIONS									
Building and Grounds Cleaning & Maintenance			1						1
Construction & Extraction Occupations			12	6		40			58
Farming, Fishing & Forestry			10		40	27	21		98
Food Preparation									0
Healthcare Support	936	107			105				1,148
Installation, Maintenance & Repair Occupations		3							3
Office and Administrative Support		15	2		1	1			19
Production		1							1
Sales & Related Occupations				1					1
Transportation & Material Moving Occupations		115			27				142
Total Degrees & Certificates	1,109		251	448	5,711	2,387	490	40	10,787

Source: Jacob France Institute analysis of Maryland Higher Education Commission data.

Results of Alignment of Labor Supply and Labor Demand

Table 16 presents the results of the alignment of labor supply and labor demand. For labor demand, the focus is on job openings which include both new jobs as well as replacement jobs due to retirements and workers leaving an occupational group for other employment. The results from both the low- and high-growth scenario of labor demand are presented.

While the labor demand from the primary industry clusters found in the county are not the only demand drivers for workforce, they do represent an important class of industry that drives economic wealth in the county. The needs of these primary industries are of particular importance to the county's economic development efforts.

The results suggest that the talent pipeline in the county is well aligned with labor demand of primary industry clusters in high skilled occupations whether at the high- or low-growth scenarios.

Prince George's County is generating substantially more graduates in higher-skilled occupational areas than expected demand—even under the industry high-growth scenario—for its primary industries. This includes:

- Engineering and architecture occupations where the demand by primary industries is expected to range from 163 to 380 annual job openings and the 2009 level of graduates reached 1,142.
- Life, physical, and social scientists where the demand by primary industries is expected to range from 162 to 429 annual job openings and the 2009 level of graduates reached 2,243.
- Management occupations where the demand by primary industries is expected to range from 247 to 487 annual job openings and the 2009 level of graduates reached 1,029.
- Business and financial operations where the demand by primary industries is expected to range from 260 to 573 annual job openings and the 2009 level of graduates reached 1,264.
- Computer and math scientists where the demand by primary industries is expected to range from 400 to 728 annual job openings and the 2009 level of graduates reached 1,039.

The high level of graduates compared to demand from primary industries demonstrates the potential value of having major universities and colleges located in the county.

For lower-skilled occupations, as would be expected since many only require on-the-job training, there are more uncertainties about whether the talent pipeline in the county meets the demand for workers:

- Health support occupations seem to have a higher talent pipeline than expected openings from primary industries, led by hospitals and specialized health care centers.
- Transportation training seems on par with projected demand from primary industries.
- Construction is far off in its level of training programs, which includes apprenticeship training provided through the Associated Builders and Contractors' Training Trust.
- There appears to be opportunities for training programs targeting maintenance occupations, administrative support occupations, and sales occupations.



Table 16: Comparison of Most Recent Year Graduates to Projected Annual Average Job Openings for 2008 to 2020 by Major Occupational Groupings for Prince George’s County

Occupational Categories	Most Recent Year Graduates at All Levels in Prince George’s County	Average Annual Change in Job Openings in Primary Industry Clusters from 2008 to 2020 in Prince George’s County	
		Low Estimate	High Estimate
HIGHER-SKILLED OCCUPATIONS			
Arts, Design, Entertainment, Sports, and Media	320	45	75
Business and Financial Operations	1,264	260	573
Community and Social Services	374	32	46
Computer and Mathematical Science Occupations	866	400	728
Education, Training, and Library	872	8	22
Engineering and Architecture	1,142	163	380
Healthcare Practitioners and Technical	492	169	261
Legal	20	17	46
Life, Physical, and Social Science	2,243	162	429
Management	1,029	247	487
Protective Service Occupations	521	139	354
LOWER-SKILLED OCCUPATIONS			
Building and Grounds Cleaning & Maintenance	1	146	408
Construction and Extraction Occupations	150	756	822
Farming, Fishing & Forestry	98	9	11
Food Preparation*	0	57	141
Health Care Support	212	81	120
Installation, Maintenance, and Repair Occupations	3	200	276
Office and Administrative Support Occupations	19	624	1192
Production Occupations	1	62	169
Sales and Related Occupations	1	377	588
Transportation and Material Moving Occupations	142	86	142

*Does not include graduates from PGCC’s Hospitality Training Program.

Source: Jacob France Institute analysis of Maryland Higher Education Commission data.

Implications for Advancing Workforce Development

The findings on the alignment of labor supply with the projected demand by the primary industry clusters suggests that to a great extent the county has the ability to address its own needs without reaching out to the broader region’s laborshed. This is particularly true for high-skilled occupations.

The fact that the county’s talent pipeline is so robust in generating a broad base of graduates points to the importance of finding ways to connect employers to graduates. With a strong connectivity of graduates to employers, Prince George’s County can realize the potential of tapping this strong pipeline of graduates to meet its workforce needs. Having a strong base of graduates also suggests the importance of finding ways to create experiential learning opportunities that can help ensure a more work-ready base of graduates by providing them with hands-on applications skills.

Another key implication of the alignment of labor supply and demand is that there are many opportunities for creating more training programs for lower-skilled occupations to work with primary industries in the county. This is particularly important for Prince George's County because not only are there many residents without the college degrees needed for higher-skilled occupations, there is also a growing in-migration of international workers who do not possess higher education.



Broader Patterns of Labor Supply in Prince George's County

As the county considers its position in future workforce development, it is also important to consider broader issues related to labor supply in the county, including:

- How is the county faring in its overall population and migration patterns?
- How do county residents compare on educational attainment and occupational employment?
- How is the county doing in preparing K-12 students for post-secondary education?
- What are the commuting patterns found in the county?
- What is the expected impact of transportation investments in providing the county with access to the broader workforce of the region?

Two points of reference are made in addressing these broader patterns of labor supply:

- One is how Prince George's County compares to the region, or if that is not available, to the State of Maryland. Many of these comparisons to the region and state are based on analysis of the U.S. Census' American Community Survey.
- The other is how Prince George's County compares to benchmark counties in the region and across the nation.

In selecting these benchmark counties, an effort was made to find those counties in the region and across the U.S. that are similar to Prince George's County, since this will allow for an "apples to apples" comparison. The criteria used to choose the benchmarks included:

- Population size, since at just over 800,000 residents, Prince George's County is one of the nation's larger counties.
- Suburban location in a large metropolitan region, since Prince George's County does not have large cities within its jurisdiction, but is an integrated part of the larger Washington, D.C. Metropolitan area.

Two other comparative dimensions to Prince George's County are also important but much harder to find in other large, suburban counties with no major cities in its jurisdiction:

- One is having a large minority population. Prince George's County stands as one of the few large counties in the United States to have a majority minority population, with 64 percent of its population being African-American and another 13 percent being of Hispanic/Latino ethnicity.
- The other hard to find criterion is being home to large research institutions, with Prince George's County home to a world-class research university, UMCP, in addition to several national laboratories.

In consultation with M-NCPPC, 14 benchmark counties in two groupings were identified—one grouping being benchmark counties from the region and the other grouping being benchmark counties from outside the region. Table 17 sets out the selected counties against the criteria identified:

Table 17: Selected Benchmark Counties by Key Criteria

County	Population Size	Largest City*	Black or African-American Population Share	Hispanic Population Share (of any race)	Presence of Large Research Institutions
Prince George's County	820,852	Bowie – 53,417	64%	13%	Yes
Regional Benchmark Counties					
Anne Arundel County, MD	512,790	Annapolis – 36,879	15%	5%	No
Baltimore County, MD	785,618	Towson – 51,793	25%	3%	Yes
Charles County, MD	140,764	St. Charles – 33,379	39%	4%	No
Fairfax County, VA	1,015,302	Burke – 57,737	10%	14%	No
Frederick County, MD	225,721	Frederick – 59,644	8%	6%	Yes
Howard County, MD	274,995	Columbia – 88,254	17%	5%	Yes
Loudoun County, VA	289,995	Leesburg – 40,927	8%	10%	No
Montgomery County, MD	950,680	Rockville – 62,105	16%	15%	Yes
Prince William County, VA	364,734	Dale City – 63,616	19%	19%	No
National Benchmark Counties					
DeKalb County, GA (Atlanta MSA)	739,956	Decatur – 18,942	54%	10%	No
DuPage County, IL (Chicago MSA)	930,528	Naperville – 143,661	5%	13%	No
Jefferson County, CO (Denver MSA)	533,339	Lakewood – 141,937	1%	14%	No
Middlesex County, NJ (New York City MSA)	789,102	New Brunswick – 51,579	10%	18%	Yes
Wake County, NC (Raleigh-Durham MSA)	866,410	Raleigh – 405,612	20%	9%	Yes

* Towson, St. Charles, Burke, Columbia, and Dale City are incorporated communities.

Source: U.S. Bureau of the Census

Population Trends and Population Dynamics

Prince George's County has been and is projected to continue to be one of the slowest growing jurisdictions in the region. Prince George's County experienced population growth of just two percent compared to eleven percent for the region and eight percent for the nation (see Table 18). Looking ahead to 2030, the U.S. Census projects that Prince George's County will continue to lag the region in projected growth, as well as be off the national pace of population growth.

Table 18: Population Growth in the U.S., Washington, D.C. Metropolitan Region, and Prince George's County 2001–2009–2030

	Historical		Projections			2001–2009		2009–2030	
	2001	2009	2010	2020	2030	# Change	% Change	# Change	% Change
United States	285.1M	307.0M	310M	341M	373M	21.9M	8%	66M	22%
Total Washington, D.C. Metro Region	4.9M	5.5M	5.6M	6.4M	7M	549,000	11%	1.6M	28%
Prince George's County	815,028	834,560	862,800	921,900	960,800	19,532	2%	126,240	15%

Source: *2001, 2008 and 2009 Population Estimates were taken from County Population Datasets. U.S. Projections from the U.S. Bureau of the Census

This slower growth in population is projected to also result in the lagging growth in available labor force in the county going into the future. As a result of the combination of slower than average population growth and a decline in labor force participation due to a projected lower rate of in-migration and an aging population, the overall county workforce is projected to grow by only eight percent through 2030 (see Table 19).

Table 19: Labor Force, 2008–2030

	Projections				2008-2030	
	2008	2010	2020	2030	# Change	% Change
Total Maryland	2,997,713	3,027,210	3,284,440	3,373,440	375,727	13%
Prince George's County	450,970	456,830	478,880	485,210	34,240	8%

Source: Bureau of Labor Statistics and Maryland Office of Planning

Among benchmark counties in the region and across the nation, Prince George's County has had very slow population growth. Since 2000, the county has increased its population 3.9 percent, well behind the overall growth rate for the U.S. at 8.8 percent (see Table 20). Many of the comparison counties are among the fastest-growing counties in the nation, with half of the comparison counties having double-digit growth rates, and among those, two regional counties—Loudoun and Prince William counties in Virginia—among the fastest growing at 73.2 percent and 33.4 percent, respectively.

Table 20: Population Growth for Prince George's County and Benchmark Counties, 2000 to 2009

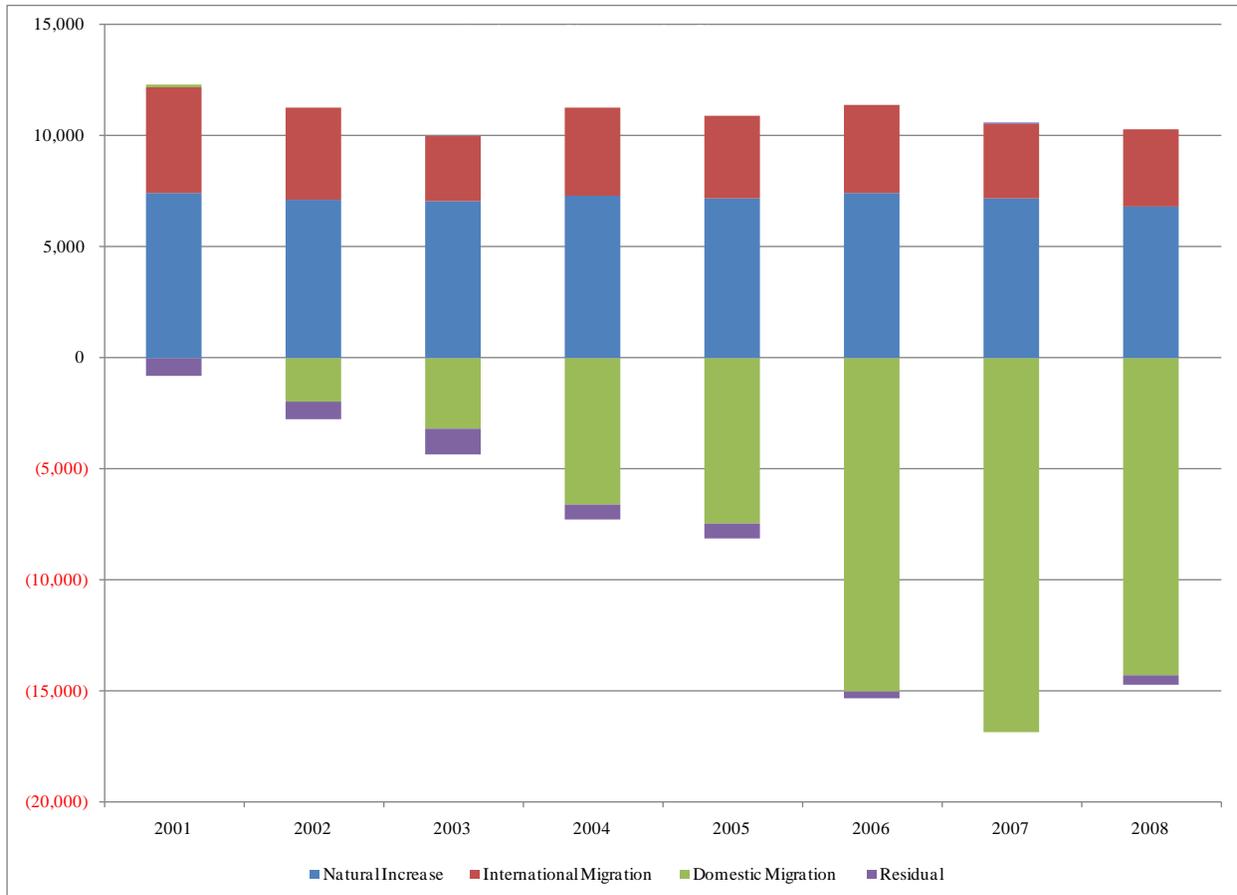
County	Percentage Change
United States	8.8%
Prince George's County, MD	3.9%
Anne Arundel, County, MD	6.1%
Baltimore County, MD	4.5%
Charles County, MD	1.37%
Frederick County, MD	16.0%
Howard County, MD	12.9%
Montgomery County, MD	10.7%
Fairfax County, VA	6.4%
Loudoun County, VA	73.2%
Prince William County, VA	33.4%
Jefferson County, CO	2.0%
DeKalb County, GA	11.7%
DuPage County, IL	2.9%
Middlesex County, NJ	5.1%
Wake County, NC	41.6%

Source: U.S. Census Bureau, Population Division, March 2010

Dynamics of Population Change in Prince George's County

A closer examination of the dynamics of population change suggests that the county is experiencing high levels of net out-migration among residents, which picked up steam in 2002 and has stabilized since 2006 at around 15,000 residents leaving the county each year. Offsetting this loss of residents is native population growth from births and a continuous stream of international in-migration of approximately 7,000 each year. However, for the last several years, both native population growth and international in-migration have failed to overcome the county's high rate of domestic out-migration (see Figure 3).

Figure 3: Prince George's County—Sources of Population Change 2001–2008⁹



Source: U.S. Bureau of Census Population Estimates

Statistics Concerning Prince George's County's In- and Out-Migration Patterns

To get a better understanding of where population is moving in and out of Prince George's County and the household incomes of those moving in and out, available domestic migration data from the U.S. Internal Revenue Service (IRS) was reviewed. The IRS tracks data on the number of new residents who moved to a county or state and where they migrated from, and outflows—the number of residents leaving

⁹ Residual represents the change in population that cannot be attributed to any specific demographic component of population change. It results from the estimation process used by the Bureau of the Census.

a county or state and where they went.^{10 11} Data were available for 2004 through 2008, with the most recent data covering the 2007–2008 period.

As presented in Table 21, Prince George’s County is experiencing a net outflow of residents—both to other jurisdictions in Maryland and to other states. Between 2007 and 2008, the county had a net outflow of 4,120 IRS tax returns, a measure of taxpaying households with 9,925 exemptions, a measure of the size of the taxpaying household.¹² The only sources of a net-inflow of residents are from the region and outside of the U.S.

Table 21: IRS Migration Data for Prince George’s County, 2007–2008

Item	Outflow				Inflow				Net Inflow	
	Returns	% of Total	Exemptions	% of Return	Returns	% of Total	Exemptions	% of Return	Returns	Exemptions
Total Migration ¹	27,723		51,616		23,603		41,691		(4,120)	(9,925)
In-Maryland	12,677	46%	23,992	46%	8,428	36%	14,769	35%	(4,249)	(9,223)
Montgomery County	4,370	16%	7,993	15%	3,793	16%	6,623	16%	(577)	(1,370)
Anne Arundel County	2,483	9%	4,631	9%	1,304	6%	2,306	6%	(1,179)	(2,325)
Charles County	1,888	7%	4,039	8%	954	4%	1,793	4%	(934)	(2,246)
Howard County	1,259	5%	2,408	5%	759	3%	1,289	3%	(500)	(1,119)
Baltimore County	695	3%	1,205	2%	501	2%	854	2%	(194)	(351)
Baltimore city	591	2%	958	2%	375	2%	629	2%	(216)	(329)
Calvert County	386	1%	778	2%	186	1%	334	1%	(200)	(444)
St Mary’s County	259	1%	525	1%	124	1%	226	1%	(135)	(299)
Frederick County	219	1%	422	1%	128	1%	210	1%	(91)	(212)
Other Maryland	527	2%	1,033	2%	304	1%	505	1%	(223)	(528)
District of Columbia	3,814	14%	7,045	14%	5,229	22%	10,357	25%	1,415	3,312
Virginia	3,159	11%	5,746	11%	2,648	11%	4,732	11%	(511)	(1,014)
Pennsylvania	416	2%	718	1%	385	2%	566	1%	(31)	(152)
North Carolina	878	3%	1,739	3%	329	1%	584	1%	(549)	(1,155)
Florida	607	2%	1,090	2%	480	2%	817	2%	(127)	(273)
Other States	5,837	21%	10,675	21%	5,250	22%	8,741	21%	(587)	(1,934)
Foreign	12,677	46%	23,992	46%	8,428	36%	14,769	35%	519	514

¹For states other than Maryland the data are for the counties experiencing the most migration—not the total for the state.

Source: Internal Revenue Service

¹⁰ U.S. Internal Revenue Service, Statistics of Income Division, U.S. Population Migration Data.

¹¹ The IRS data contains information for international migrants. A migrant is classified as an “in-migrant from foreign” if the year-1 state code is foreign or if the return is a year-2 only 1040NR. For more information, see U.S. Internal Revenue Service, Statistics of Income Division, 2007–2008 Supplemental Documentation for Migration Data Products report.

¹² The IRS provides data on tax returns, or number of actual tax returns filed, which are matched by the IRS to try to control for joint and separate filings and exemptions—which is defined as the total number of exemptions claimed. An exemption is allowed for each person in the filing household.

Further analysis of IRS data suggests that the households (returns) leaving the county have higher average incomes than those moving in, as set out in Table 22.

Table 22: Average Adjusted Gross Income Per Return for In- and Out- Migrants, 2007–2008

	In-Migrants	Out-Migrants
Total Migration	\$36,404	\$41,048
Total Migration – U.S.	\$36,980	\$41,088
Total Migration – Within Maryland	\$39,973	\$45,907
Total Migration – U.S. Different State	\$35,219	\$36,935
Total Migration – District of Columbia	\$35,796	\$31,834
Total Migration – Outside of the U.S.	\$21,067	\$37,794

Source: Internal Revenue Service

Statistics on International In-Migrants in Prince George’s County

Data from the Census American Community Survey (ACS) gives an overall picture of immigrants residing in the county. While, there may be differences between the annual flow of immigrants into the county and the current population of immigrants already residing in the county, the ACS data is the best available to describe the immigrant community. As presented in Table 23, the immigrants residing in Prince George’s County:

- Are generally younger than the region’s immigrant community.
- Are less likely to be naturalized citizens compared to the immigrants in the region.
- Are more likely to be from Latin America and “other” regions. Based on the interviews conducted, the “other” place of birth classification presumably includes a large number of immigrants from Africa that live in the county.
- Generally have a lower level of educational attainment compared to immigrants in the region.
- Are more likely to be in the workforce and employed compared to the immigrants in the region.
- Have a lower median household income than both the county average and immigrant households in the region.
- Are likely to be employed in the private sector, are less likely to be employed in higher-skilled management and professional occupations, and are more likely to be employed in construction and extraction; installation, maintenance, and repair occupations; production; and transportation and materials moving occupations than when compared to the immigrant population in the region.

Interestingly, despite the recent growth of the international immigrant population in Prince George’s County, as of 2008 this population group still comprises a slightly smaller share of the county’s total population than found in the region.

Table 23. Details of Prince George's International Immigrant Community Compared to the Washington, D.C. Metropolitan Region, 2008

Item	Region	% of Total	Prince George's County	% of Total
Total Population	5,356,474		820,852	
% of Total Population	20.3%		18.5%	
Foreign-born population	1,089,950		151,825	
Naturalized citizen	486,864	44.7%	58,592	38.6%
Not a citizen	603,086	53.3%	93,233	61.4%
World Region of Birth of Foreign Born				
Europe	113,788	10.4%	5,299	3.5%
Asia	392,471	36.0%	24,571	16.2%
Latin America	419,444	38.5%	81,756	53.8%
Other	164,247	15.1%	40,199	26.5%
Median Age	40.5		38.3	
Educational Attainment¹				
Population 25 years and over	924,807		127,180	
Less than high school graduate	203,458	22.0%	42,351	33.3%
High school graduate (includes equivalency)	161,841	17.5%	24,927	19.6%
Some college or associate's degree	176,638	19.1%	26,072	20.5%
Bachelor's degree	200,683	21.7%	18,441	14.5%
Graduate or professional degree	182,187	19.7%	15,389	12.1%
Labor Force Participation¹				
Population 16 and Older	1,025,962		143,839	
In labor force	793,069	77.3%	117,948	82.0%
Civilian labor force	791,017	77.1%	117,660	81.8%
Employed	749,978	73.1%	109,749	76.3%
Unemployed	40,013	3.9%	7,767	5.4%
Percent of civilian labor force	52,324	5.1%	9,637	6.7%
Armed Forces	2,052	0.2%	288	0.2%
Not in labor force	232,893	22.7%	25,891	18.0%
Civilian employed population 16 years and over				
	750,133		109,803	
Class of worker				
Private wage and salary workers	596,356	79.5%	90,038	82.0%
Government workers	101,268	13.5%	13,725	12.5%
Self-employed workers in own not incorporated business	51,009	6.8%	5,710	5.2%
Unpaid family workers	1,500	0.2%	329	0.3%
Occupation				

Table 23 continued. Details of Prince George's International Immigrant Community Compared to the Washington, D.C. Metropolitan Area, 2008

Item	Region	% of Total	Prince George's County	% of Total
Management, professional, and related occupations	290,301	38.7%	32,941	30.0%
Service occupations	172,531	23.0%	27,121	24.7%
Sales and office occupations	132,774	17.7%	15,921	14.5%
Farming, fishing, and forestry occupations	750	0.1%	110	0.1%
Construction, extraction, maintenance, and repair occupations	95,267	12.7%	23,059	21.0%
Production, transportation, and material moving occupations	57,760	7.7%	10,651	9.7%
Median Household Income (\$s)	\$72,069		\$63,326	

Source: Jacob France Institute Analysis of 2008 American Community Survey

Based on this analysis of U.S. Bureau of the Census and IRS data on total, international, and domestic migration patterns, Prince George's County has been losing population, primarily due to domestic out-migration for several years. The county is losing residents to other jurisdictions in Maryland and to other states, with the exception of the District of Columbia and international migrants. More importantly, out-migrants have, on average, higher incomes than in-migrants.

Educational Attainment and Occupations of Prince George's County's Residents

Another dimension of labor supply is the broad skill and occupational base of local residents. Using ACS data, it is possible to examine both the educational attainment of residents and the occupations they hold. Educational attainment among a region's residents is an indicator of the population's ability to hold higher-skilled jobs, and, as a consequence, is a major predictor of economic outcomes including per capita incomes. It is typically measured as the level of education that the adult population ages 25 and over has reached within a community.

Prince George's County has a much lower level of educational attainment compared to the region. The educational attainment level of the county's and region's adult population is shown in Table 24. While the number of residents ages 25 or older with an associate's degrees is slightly higher than the region, the county falls off as educational levels rise, standing at only 17 percent with bachelor's degrees compared to 25 percent for the overall region, and 12 percent with graduate degrees compared to 22 percent for the region overall.

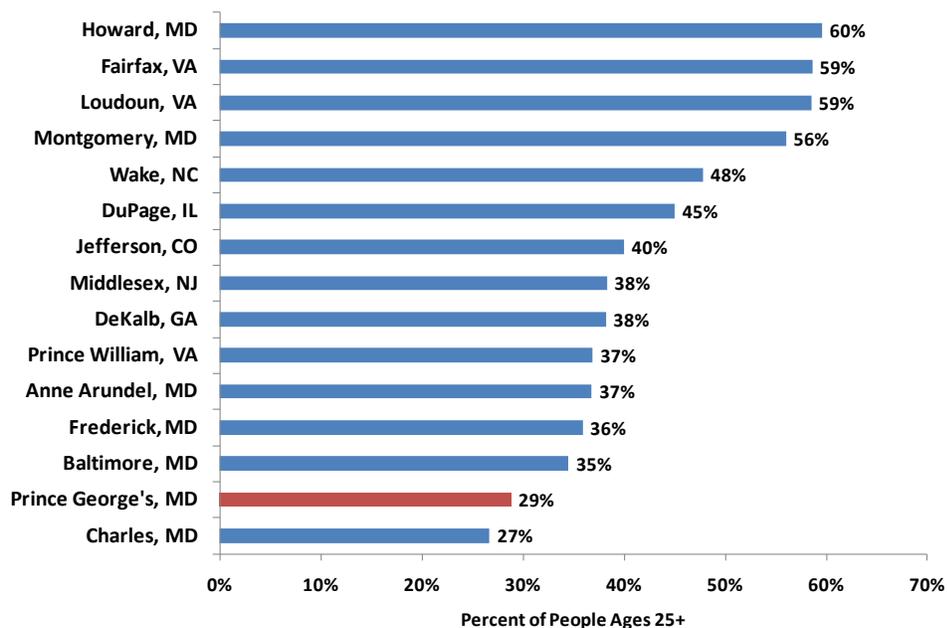
Table 24: Educational Attainment – Population 25 and Older, 2008

Item	Prince George's County	% of Total	Region	% of Total
Population – Age 25 and Older	527,768	100.0%	3,551,527	100.0%
Less than 9th grade	36,316	6.9%	179,638	5.1%
9th to 12th grade, no diploma	40,445	7.7%	200,008	5.6%
High School Graduate	145,161	27.5%	677,241	19.1%
Some College	122,372	23.2%	632,943	17.8%
Associate Degree	31,610	6.0%	198,606	5.6%
Bachelor's Degree	89,489	17.0%	885,339	24.9%
Graduate or Professional Degree	62,375	11.8%	777,752	21.9%

Source: U.S. Bureau of the Census , 2008 American Community Survey

This lagging position in educational attainment is also found in comparing Prince George's County with regional and national benchmark counties. The county lags nearly all of the benchmark counties in terms of postsecondary degrees of residents ages 25 or older. Still, Prince George's County at 29 percent is slightly above the U.S. average of 27 percent of its residents 25 years or older with bachelor's degree or higher (see Figure 4).

Figure 4: Percent of Residents with Bachelor's Degree or Higher



Source: U.S. Bureau of the Census, 2008 American Community Survey

Given this lower level of educational attainment at the post-secondary levels, it is not surprising that Prince George’s County has fewer residents in high-skilled occupational groups. Only 39 percent of county residents are employed in the high-skilled category of management, professional and related occupations compared to just fewer than 50 percent for the region (see Table 25). Consistently higher levels of Prince George’s County residents work in services, sales, construction, and production and transportation-related occupations than found across the region.

Table 25: Occupational Employment of Residents

Item	Prince George’s County	% of Total	Region	% of Total
Civilian employed population 16 years and over	445,578	100.0%	2,900,557	100.0%
Management, professional, and related occupations	172,544	38.7%	1,444,279	49.8%
Service occupations	78,941	17.7%	429,950	14.8%
Sales and office occupations	113,111	25.4%	637,089	22.0%
Farming, fishing, and forestry occupations	163	0.0%	2,676	0.1%
Construction, extraction, maintenance and repair occupations	43,821	9.8%	213,914	7.4%
Production, transportation, and material moving occupations	36,998	8.3%	172,649	6.0%

Source: U.S. Bureau of the Census, 2008 American Community Survey

Primary and Secondary Education

Another area of concern in labor supply is how well the primary and secondary education system in Prince George’s County is able to generate a future workforce able to move on to post-secondary education or workforce training, as well as oriented to key career pathways. Data was collected and analyzed from the Maryland State Department of Education (MSDE) on trends and performance in Prince George’s County public schools. The core data are from the MSDE 2008–2009 Fact Book¹³ and the MSDE website.¹⁴

Based on the selected MSDE data reviewed, Prince George’s County has the second largest school district in terms of enrollment and the sixth highest overall level of per pupil spending in the State of Maryland. According to the MSDE Educational Effort Index, which compares education spending to the level of wealth in the jurisdiction, the county spends slightly less than the state average adjusted for wealth, but is tied for having the 8th highest overall level of effort. However, all key competing surrounding jurisdictions with the exception of Anne Arundel County, all have much higher levels of overall educational effort.

Prince George’s County has total Career and Technology Education (CTE) program enrollment of 13,900 students, the second largest CTE enrollment in the state, consistent with having the second largest overall

¹³ See http://www.marylandpublicschools.org/NR/rdonlyres/FCB60C1D-6CC2-4270-BDAA-153D67247324/23145/Fact_Book_08_09_rev022211.pdf.

¹⁴ The MSDE website is <http://www.marylandpublicschools.org/msde> and the Report Card with comparative county data is <http://www.mdreportcard.org/index.aspx>.

level of public school enrollment. CTE programs provide education and training in targeted business and skills areas (see Table 26). The largest county CTE program is in the business management, marketing, and finance area with 65 percent of total CTE enrollment, a higher concentration than in all other counties in this field.¹⁵ The county has relatively low CTE enrollment in health and biosciences, manufacturing, engineering and technology, and information technology—all of which are either key existing or targeted employment sectors in the county. Based on discussions with the county’s CTE director, the county has a dedicated health program at Bladensburg High School that is not classified formally as a CTE by the state, with total enrollment of approximately 200. A total of 99.4 percent of county 12th graders have passed all four High School Assessment (HSA) tests. The Prince George’s County public school system also faces some challenges in serving a higher concentration of lower income students indicated by the fact that the county has the fourth highest overall level of free and reduced price meals (a measure of low income status) in the state.

Table 26: Selected Education Performance Statistics, 2008–2009

Item	Fall Enrollment	Cost Per Pupil	Education Effort Index ¹	% Free and Reduced Price Lunches	12 Grade HSA1 4 Test Pass Rate All 4 Tests	CTE Program Enrollment
Total Maryland	843,781	\$12,509	1.00	60%	99.9%	107,615
Prince George’s County	127,977	\$13,024	0.98	67%	99.4%	13,900

¹ The Education Effort Index is calculated by the Maryland State Department of Education to assess education spending. Education spending is divided by local wealth and indexed to the state average. An index above 1.00 indicated greater than state-level average and an index below 1.00 indicated spending below the state average.

Source: Maryland State Department of Education

High school graduation rates are another important indicator of the performance of the primary and secondary education system in Prince George’s County in generating a future workforce able to move on to post-secondary education or workforce training. Since nearly all occupations require some training or education beyond high school, the level of high school graduation rates is more of an intermediate measure, but a crucial one. The number of high school graduates and dropouts is presented in Table 27. Prince George’s County accounts for 14 percent of high school graduates but only 7 percent of high school dropouts in the State of Maryland. The county’s reported dropout rate of 1.34 percent of students in grades 9 through 12 was the 4th lowest in the state. The dropout rate is significant to this study of workforce development in Prince George’s County for two reasons:

- The dropout rate is considered by many to serve as a measure of the quality of a jurisdiction’s educational system and, thus, the low dropout rate may be considered a source of educational advantage in Prince George’s County; and,
- Students that drop out of high school often face barriers to employment and require additional training or assistance to enter the labor force. These dropouts represent a source of labor supply that requires access to workforce development programs and assistance. As a result, dropouts represent a target population for the workforce development system.

¹⁵ The analysis of CTE enrollment by area is from data in the MSDE 2009 Fact Book.

Table 27: High School Dropouts and Graduates, Grades 9-12: 2008–2009

Item	High School Graduates	% of Total	High School Dropouts Grades 9–12	% of Total	High School Dropouts Rate ¹
Total Maryland	59,002	100%	7,920	100%	2.80%
Prince George’s County	8,345	14%	586	7%	1.34%

¹The dropout rate excludes re-entries.

Source: Maryland State Department of Education 2008 – 2009 The Fact Book. The time period is the 2008-2009 School Year. http://www.msde.maryland.gov/NR/rdonlyres/075539F6-8792-462A-BAB6-5074A29705A3/23145/Fact_Book_08_09_rev022211.pdf

Based on the reported results of the MSDE 2009 High School Graduate Questionnaire, the total number of potential workforce entrants in Prince George’s County from the 2009 class was estimated. The results are presented in Table 28. Counting students who plan to go to school part-time, those that plan to enter the workforce, and dropouts, an estimated 2,387 youth enter the workforce each year at the high school level of education or below.

While 2,387 is a significant number of students who are entering the workforce with just a high school level of education or below, it is a manageable number. These students should be targeted for workforce training and apprenticeship programs to enter the many available career pathways that do not require higher levels of education, such as in construction, installation and maintenance, health care support services, and transportation.

Table 28: Labor Supply – High School Graduation and Dropouts in Prince George’s County, 2009

Item	
Total High School Graduates	8,345
College-Full Time	5,609
College-Part Time	519
Trade/Bus. School Full-Time	578
Work Full-Time	1,074
Military Full-Time	358
Other	208
High School Dropouts	586
Potential Labor Market Entrants ¹	2,387

Note: H.S. post-graduation plans based on survey responses applied to total graduates.

¹ Graduates planning to become part-time students, work full-time and other plus H.S. dropouts.

Source: Jacob France Institute and Maryland State Department of Education

Commuting Pattern Analysis

The place of employment and commuting patterns for employed county residents is an important factor in describing the overall role of the county in the state and regional economy and laborshed. Prince George’s County is a major source of out-commuters for the region with only 38.6 percent employed in their county of residence, much lower than the 49.1 percent for the region, as shown in Table 29.

Table 29: Commuting Patterns – Place of Work of Prince George’s County Residents, 2008

Item	Prince George’s County	% of Total	Region	% of Total
Total	440,212	100.0%	2,893,548	100.0%
Worked in state of residence	248,926	56.5%	2,141,794	74.0%
Worked in county of residence	169,809	38.6%	1,421,890	49.1%
Worked outside county of residence	79,117	18.0%	719,904	24.9%
Worked outside state of residence	191,286	43.5%	751,754	26.0%

Source: U.S. Bureau of the Census, 2008 American Community Survey

Compared to the benchmark counties from the region and from across the nation, Prince George’s County had one of the lowest levels of residents working within their county, with only Prince William County, VA having a lower share of its residents working within its county (see Table 30).

Table 30: Percentage of Residents Working in County for Prince George’s County and Benchmark Counties

County	Worked in county of residence, 2008
United States	73%
Prince George’s, MD	39%
Anne Arundel, MD	56%
Baltimore County, MD	50%
Charles, MD	40%
Frederick, MD	60%
Howard, MD	40%
Montgomery, MD	60%
Fairfax, VA	54%
Loudoun, VA	48%
Prince William, VA	36%
Jefferson, CO	51%
DeKalb, GA	46%
DuPage, IL	60%
Middlesex, NJ	56%
Wake, NC	82%

Source: 2008 American Community Survey

A more extensive examination of the ACS’s Public Use Micro Sample (PUMS) allows for the analysis of key demographic and other variables for populations where the U.S. Census does not publish statistics as part of its core tables and reports. These data were used to analyze the demographic and workforce development characteristics of three groups of employed county residents—those working in the county, those employed outside of the county in other Maryland jurisdictions, and those employed outside of the State of Maryland. The results of



this analysis are presented in Table 31 (for demographics and earnings) and Table 32 (for industry and occupation of employment). According to this analysis:

- Commuting patterns vary by race and Hispanic origin. Whites have a higher concentration in in-county employment, African Americans in out-of-state employment, and Hispanics in employment in other Maryland jurisdictions (Table 31).
- Out-commuters earn more than residents working in the county, with the average wage and salary income of a county resident working out-of-state being \$53,614 and the average wage and salary income of a county resident working in another Maryland county being \$44,818 compared to \$37,305 in wage and salary income for a county resident working in-county (Table 31).
- Out-commuters are more highly educated than residents working in the county, with 44 percent of out-of-state commuters and 32 percent of commuters to other Maryland jurisdictions having attained a bachelor's degree or above, compared to 29 percent of residents employed in-county (Table 31).
- Twenty-eight percent of out-of-state commuters and 12 percent of commuters to other Maryland jurisdictions work for the federal government, compared to nine percent of in-county workers. This concentration of federal employment may support ongoing efforts to attract federal employment centers into the county and could also justify exploring the development of federal telecommuting centers (Table 31).
- Twenty-seven percent of out-of-state commuters use public transit, compared to nine percent of commuters to other Maryland jurisdictions, and seven percent of residents employed in-county. The lower share of commuters to other Maryland jurisdictions using mass transit may indicate demand for enhanced mass transit options between jurisdictions—such as the proposed Purple Line. Several of the persons interviewed as part of this analysis reported that the county and regional mass transit system is well suited for commuting outside of the county, especially to the District of Columbia, but is less intensive in linking employment and residential centers inside the county. This perception may be supported by the finding of the PUMS analysis that only seven percent of residents working in the county use mass transit (Table 31).
- Out-of-state commuters have a high share of employment in the public administration; educational services, and health care and social assistance; and professional, scientific, and management, and administrative and waste management services sectors, which tend to have higher wages and a higher concentration of higher-skilled employment (Table 32).
- Commuters to other Maryland jurisdictions similarly have a high share of employment in the educational services, and health care and social assistance and professional, scientific, and management, and administrative and waste management services sectors—but also have a high share of employment in the construction sector. This may indicate that these out-commuters include a mix of lower- and higher-skilled occupations (Table 32).
- Residents employed in-county tend to be more concentrated in lower-skilled and lower-waged retail; construction; and arts, entertainment, recreation and accommodation and food services sectors. The county, home to the state's flagship public university and also to a high concentration of local government workers (for which the Board of Education is the largest employer). It also has a high concentration of employees in the educational services, and health care and social assistance sectors. Overall, residents employed in-county tend to be more concentrated in the lower-skill and lower-wage occupations (Table 32).
- Out-of-state commuters have a high concentration of employment in high-skilled management, business, and financial occupations (21 percent) and computer, engineering, and science occupations (8 percent). However, they also have a high concentration of employment in lower-skilled office and administrative support occupations (21 percent), indicating that these out-commuters are divided between higher- and lower-skilled occupations (Table 32).

Table 31: Workforce Demographic Characteristics of Prince George's County Residents by Place of Work¹, 2008

Item	Place of Work					
	In-County		Maryland – Other		Out of State	
	#	%	#	%	#	%
Total Responses	1,651		744		1,735	
Demographics						
White alone	508	31%	249	33%	291	17%
Black or African American alone	900	55%	380	51%	1,260	73%
Hispanic	223	14%	155	21%	183	11%
Citizenship						
U.S. Citizen by Birth	1,244	75%	479	64%	1,358	78%
Naturalized Citizen	177	11%	97	13%	192	11%
Not a Citizen	230	14%	168	23%	185	11%
Average Wage and Salary Income	\$37,304		\$44,818		\$53,614	
Educational Attainment						
Less Than High School	228	14%	117	16%	171	10%
High School Graduate	443	27%	176	24%	408	24%
Some College	420	25%	170	23%	446	26%
Associate Degree	80	5%	38	5%	120	7%
Bachelor's Degree	264	16%	144	19%	358	21%
Graduate or Professional Degree	216	13%	99	13%	232	13%
Class of Worker						
Private Company/Nonprofit Organization	1,019	62%	581	78%	1,001	58%
Local Government	207	13%	21	3%	142	8%
State Government	98	6%	17	2%	45	3%
Federal Government	152	9%	87	12%	489	28%
Self Employed	175	11%	38	5%	58	3%
Means of Transportation to Work						
Car, truck, or van	1,310	79%	677	91%	1,243	72%
Public transportation (excluding taxicab)	111	7%	65	9%	475	27%
Bicycle	14	1%	0	0%	3	0%
Walked	68	4%	0	0%	3	0%
Taxicab, motorcycle, or other means	15	1%	2	0%	11	1%
Worked at home	133	8%	0	0%	0	0%

¹ The total number is the total number of responses for each question.

Source: Jacob France Institute Analysis of 2008 American Community Survey, PUMS Data

Table 32: Workforce Demographic Characteristics of Prince George’s County Residents by Place of Work¹

Item	Place of Work					
	In-County		Maryland – Other		Out of State	
	#	%	#	%	#	%
Total responses	1,651		74		1,735	
Industry of Employment						
Agriculture, forestry, fishing and hunting, and mining	6	0%	0	0%	2	0%
Construction	121	7%	104	14%	122	7%
Manufacturing	67	4%	24	3%	38	2%
Wholesale trade	42	3%	12	2%	16	1%
Retail trade	186	11%	67	9%	58	3%
Transportation and warehousing, and utilities	90	5%	29	4%	111	6%
Information	46	3%	28	4%	49	3%
Finance and insurance, and real estate and rental and leasing	90	5%	49	7%	87	5%
Professional, scientific, and management, and administrative and waste management services	158	10%	150	20%	316	18%
Educational services, and health care and social assistance	421	25%	148	20%	314	18%
Arts, entertainment, and recreation, and accommodation, and food services	144	9%	37	5%	92	5%
Other services, except public administration	110	7%	26	3%	89	5%
Public administration	170	10%	70	9%	441	25%
Occupational Employment						
Management, Business, and Financial Occupations	213	13%	106	14%	360	21%
Computer, Engineering, and Science Occupations	99	6%	67	9%	143	8%
Education, Legal, Community Service, Arts, and Media Occupations	230	14%	58	8%	183	11%
Healthcare Practitioners and Technical Occupations	75	5%	55	7%	88	5%
Service Occupations	324	20%	121	16%	261	15%
Sales and Related Occupations	154	9%	44	6%	80	5%
Office and Administrative Support Occupations	245	15%	120	16%	370	21%
Farming, Fishing, and Forestry Occupations	2	0%	1	0%	0	0%
Construction and Extraction Occupations	87	5%	95	13%	112	6%
Installation, Maintenance, and Repair Occupations	57	3%	23	3%	38	2%
Production Occupations	55	3%	14	2%	37	2%
Transportation and Material Moving Occupations	108	7%	38	5%	57	3%
Military Specific Occupations	2	0.1%	2	0.3%	6	0.3%

¹ The total number is the total number of responses for each question.

Source: Jacob France Institute Analysis of 2008 American Community Survey, PUMS Data

In summary, Prince George’s County has a large base of out-commuters working in other jurisdictions, particularly out-of-state. Resident out-commuters tend to be more highly skilled and earn more than residents working in the county. Out-commuters are employed in a broad number of sectors and across a diversity of occupations.

The Impact of Transportation Investments

The National Capital Region Transportation Planning Board's 2009 *Financially Constrained Long-Range Transportation Plan* (CLRP) was reviewed and follow-on discussions held on the issue of long-range transportation planning with M-NCPPC Transportation Planning staff and Director of Technical Services for the Department of Transportation Planning of the Metropolitan Washington Council of Governments. The CLRP compares and integrates projected population and employment growth with major capital projects, including the Inter County Connector (ICC) and Purple Line, to assess long term changes in transportation, accessibility, congestion, and performance. According to the plan "The outer suburbs is expected to grow much faster than the regional core, with dramatic increases in population and employment. The result of this growth pattern is that the inner suburbs and regional core are expected to have the highest concentrations of jobs in 2030, while the inner and outer suburbs are expected to have most of the population."¹⁶ The plan also reports that:

The road network will also experience a gap between forecasted demand and additional capacity. Given funding constraints, lane miles are only expected to increase 12 percent, while VMT (vehicle miles traveled) is expected to rise 20 percent, resulting in a 23 percent rise in lane miles of congestion. Nearly all of this increased congestion will occur in the suburbs, with the inner suburbs experiencing the worst congestion in the region. However, it is the outer suburbs that will experience the most dramatic increase in congestion, with an 84 percent increase in lane miles of congestion by 2030.¹⁷

Thus, Prince George's County, as a major inner suburb, is facing an increase in transportation congestion. Based on the plan's transportation accessibility analysis,¹⁸ northern Prince George's County borders on areas in Montgomery County that are projected to experience moderate (100,000 to 300,000) to significant (300,000+) gains in the number of jobs accessible within 45 minutes of commuting time, mostly as a result of the ICC. The central and western portions of the county are also expected to see gains in job accessibility via mass-transit. However, based on the two interviews conducted, the planned transportation investments included in the CLRP will not significantly increase the laborshed from which the county can draw workers from or send workers to because increases in accessibility will be at least partially offset by the projected rapid growth in both population and jobs and resulting increase in congestion. Furthermore, the planned transportation investments are occurring in an area already served by an extensive road and transit system. Thus, the county laborshed is likely to remain fairly constant. It is important to point out, however, that the county is already implementing plans to maximize the development potential from its existing, highly-intensive and highly-utilized mass transit system. The county is exploring transit-oriented development at all of its major metro station centers. This type of development can combine residential and employment development in a way that attracts high-quality jobs and high-income residents while minimizing related congestion.

¹⁶ Metropolitan Growth Section of the National Capital Region Transportation planning Board's 2009 Financially Constrained Long-Range Transportation Plan.

¹⁷ Travel Demand Section of the National Capital Region Transportation Planning Board's 2009 Financially Constrained Long-Range Transportation Plan.

¹⁸ Travel Demand Section of the National Capital Region Transportation Planning Board's 2009 Financially Constrained Long-Range Transportation Plan.



What is the Strategic Position and Economic Development Readiness of Prince George's County?

The analysis of the occupational shifts and workforce characteristics of Prince George's County up to this point has been primarily focused on a detailed quantitative analysis of the labor supply and demand trends impacting the county. However, to identify needed strategic actions for talent and workforce development in Prince George's County, it is also critical to ensure that the detailed quantitative assessment is grounded by the perspectives from industry executives, who represent the market-drivers of workforce demand, as well as broader stakeholders helping to lead the county's workforce and economic development efforts.

Interviews with 29 industry executives in Prince George's County were completed, focusing on their perspectives of workforce and broader economic development issues confronting the county. Interviews were also conducted with key stakeholders in the workforce development system in the county and a focus group was held with the entire Prince George's County Workforce Investment Board. In addition, broader measures of economic development readiness of Prince George's County were considered, including the availability of economic development tools, in comparison to other counties in the region.

Putting together the intelligence gathered from the quantitative analysis and industry interviews, along with input from the focus group meetings, Battelle has developed a strategic analysis of the county's strengths, weaknesses, opportunities, and threats to inform future directions in workforce and talent development actions that is presented in the main report of the study.

Industry Perspectives on Workforce and Broader Economic Development Issues Confronting Prince George's County

More than 75 firms across the primary industry clusters were identified based on industry directories, venture capital databases, and lists of recipients of federal Small Business Innovation Research (SBIR) grants. These 75 firms were contacted through email and phone calls, and 29 firms agreed to one-on-one interviews with their company executives.

These 29 industry interviews represented a broad range of industry clusters, including:

- 2 Aerospace firms: AI Solutions; ATK Aerospace
- 2 Big Box firms: Lowe's; Sears
- 2 Biosciences firms: Zymetis; Medstar Health Research Institute
- 3 Business Consulting firms: ICF; Integrated Mgt Resources; RSO
- 2 Business Support firms: ISS Facility Services; Protocall Communication
- 1 Computer Peripheral firm: Man & Machine
- 2 Hospitals: Dimensions Health; Maryland Southern Hospital
- 1 Law firm: DeCaro, Doran
- 1 Marketing firm: Joint Venture
- 1 Media Services firm: Radio One
- 1 Semiconductors firm: Pixelligent Technologies

- 1 R&D/Engineering firm: Jackson & Tull
- 1 Semiconductors firm: Pixelligent Technologies
- 3 Software & Computer Services firms: Zegato Solutions; Pitney Bowes; HeiTech Services
- 2 Telecommunications firms: RadixNet; Presidio Corp
- 2 Traditional Print Media firms: Kelly Press; District Photo
- 1 Transportation, Distribution firm: Thos Somerville
- 1 Travel & Tourism firm: Hargrove, Inc.

The interviews were focused around six key questions focused on broader economic development perspectives and more specific workforce needs:

- Broader economic development questions:
 - Why did your firm locate in Prince George’s County?
 - What are the major advantages of a Prince George’s County location?
 - What are the major disadvantages of a Prince George’s County location?
- More specific workforce needs questions:
 - What are the key and emerging workforce issues affecting your company? (i.e., retention, upgrading skills, attracting workers, etc.)
 - What are the key occupations you see your firm needing in the next three to five years and are you or do you anticipate having difficulty finding workers?
 - Do you see key shifts on skill requirements for workers in your firm in the next three to five years?

Industry Insights into the Broader Economic Development Situation

The responses from the industry executives provide a generally positive view of the economic and workforce development situation in Prince George’s County, while providing important insights into specific needs looking to the future.

In terms of the broader economic development situation, the industry executives were generally positive about the county:

- The two leading reasons why firms were located in the county were because the founder or executives lived in the county or because of the accessibility of the county to the broader region.
- The most frequently cited key advantage of being located in the county was its central location, mentioned by 14 out of the 29 industry executives interviewed.
- Other leading advantages of the county were its proximity to customers (6 responses), particularly NASA Goddard; its reasonable leasing rates for office and industrial space (5 responses), and its access to public transportation (4 responses).
- The most common response to disadvantages was “none”—by eight of the 29 industry executives interviewed. The other most frequently mentioned disadvantages—each with just three responses—were crime, traffic, and lack of amenities.

The industry executives did have ideas on how to improve the county’s economic development prospects. One key concern shared by many of the industry executives was the need to improve the image of the county. This concern is in line with the fact that there was general satisfaction expressed by the industry executives about doing business in the county, but the recognition that this is not the impression held

across the region. The industry executives expressed a need for improved marketing, especially across the region, as well as a need for signature business sites that could raise the county's profile.

The need for improved incentives was another key area identified by the industry executives to improve the county's economic development position. In particular, the need for broader incentives targeted to emerging technology companies and for hiring workers was cited by the industry executives. Improved outreach to businesses in the county, together with facilitating more business-to-business connections, were other improvement areas identified by a number of the industry executives.

Industry Insights into Specific Workforce Needs

On the workforce front, there were no major problems identified by the industry executives, but some clear needs were identified looking to the future, especially relating to information technology skills. Overall, only a few of the industry executives saw workforce issues as a major concern affecting their firms. Of these, retaining workers was mentioned by four industry executives, while finding qualified workers was raised by six industry executives.

Similarly, nearly half of the industry executives interviewed expressed that they anticipate no difficulties in finding qualified workers for jobs in demand at their firms. Of those with concerns, the major area of concern in recruiting workers was for information technology specialists. Other workforce skill gaps identified by the industry executives were generally scattered, being raised by one or two industry executives, and generally related to specific firm needs. These identified individual firm needs included workers with security clearances, experienced engineers, scientists, project managers, nurses, and sales staff.

In terms of shifting skill requirements over the next three to five years, 17 out of the 29 industry executives did not identify any key skill shifts expected in their workforce. But a distinct grouping of eight of the 29 industry executives did see a shift toward more information technology skills. This is in line with the concern about finding qualified information technology workers.

A view expressed strongly in the interviews by a number of industry executives was a broader concern about the work readiness of younger adults coming into the workforce. These industry executives see a trend in which younger adults lack a strong work ethic and seem to lack an understanding of how to behave, communicate, and dress for work. These industry executives called for more work readiness training and experiential learning in schools so young adults can make a smooth transition into the work world.

Another insight from the industry executive interviews is that the image of the county is hurting the ability of firms in Prince George's County to recruit workers from outside of the county, particularly in Northern Virginia. This is a particular problem in the information technology area, where many highly skilled, experienced workers are found in Northern Virginia and tend not to want to work in Prince George's County.

Workforce Development Perspectives

Interviews with key stakeholders in the workforce development system in the county were conducted, and a focus group held with the entire Prince George's County Workforce Investment Board in order to collect qualitative information on and to assess and validate the results of the quantitative analysis of labor market supply conditions in the county. In addition to the focus group, follow-up interviews were conducted with:

- Patricia White, Executive Director Workforce Services, Prince George's County Economic Development Corporation, Workforce Services Division.

- Tanya Anderson, Assistant Director, One-Stop Operations, Prince George’s County Economic Development Corporation, Workforce Services Division.
- Jeffrey Swilley, Deputy Director Business Services and Administration, Prince George’s County Economic Development Corporation, Workforce Services Division.
- Marcita Bentley-Pinkston, Assistant Director for Youth Services, Prince George’s County Economic Development Corporation, Workforce Services Division.
- Mike Wesdock, Regional Learning Center Manager, CVS.
- Dr. Daniel P. Mosser, Vice President for Workforce Development and Continuing Education Prince George’s Community College.
- Robert Kight, Director CTE, Prince George’s County Public Schools.

Based on the interviews and input from the focus group, there is a general consensus that the county’s workforce development system operates as a “demand-driven” system that seeks to create partnerships between employers and the education and workforce training system. The workforce development system begins by working to identify the job and occupational needs of the employer community and then links to the existing or external job training community to provide the needed pipeline of workers. There is general agreement among the key informants that the Workforce Services Division benefits from being part of the Prince George’s County Economic Development Corporation, by strengthening and integrating economic and workforce development and establishing linkages with the business community.

The core economic drivers in the county are viewed by the key informants as: government contracting—especially in information systems and technology (IT); retail and hospitality; health care; and green jobs. The key declining sectors are financial services and construction. Because of the large number of out-commuters residing in the county, declines in regional employment has had a significant negative impact on the county’s workforce. The targets of the workforce development system are hospitality, retail, health, and IT.

The views expressed by the key informants are consistent with the data presented previously. The presence of a large and diverse workforce is viewed as a core strength of the county—with one person reporting that the available workforce “runs the gamut from low to highly skilled.” Consistent with the quantitative analysis previously described, the county workforce is viewed as consisting of two distinct populations. First, the county has a large number of highly skilled and educated workers who, in the recent economic downturn, represent a growing share of the customers of the workforce development system. Secondly, the more consistent long-term base of customers for the one-stop shop and the workforce development system is the large base of lower-skilled workers. A share of this base of lower-skilled workers face a number of barriers to employment, which include: soft skills (communications, work experience, etc.); educational barriers—with some reporting “that a number of the population is basic skills deficient” with many “lacking a high school diploma;” and transportation—with the county’s transportation system viewed as efficient for out-of-county commuting, but less extensive for commuting between employment and population centers within the county.

There is a general consensus in the interviews and focus group that the workforce development system is working well and there is a high level of respect for the Workforce Services Division. However, there was also broad agreement on several steps required to improve the system. While the county’s workforce services system works well in identifying and seeking to meet the needs of the employer community, a key issue remains the coordination of the efforts of the larger educational and training community to meet these needs. Several key informants identified the need for the county to develop a broad consensus and cooperative effort among the educational and training community. The Workforce Investment Board brings these groups together—but more could be done to develop a clear and consistent strategy across the broad spectrum of education and training providers to meet the current and long-term needs of the

county and employer community. The development of such a strategy would need to be initiated and supported by the core political and business leadership of the county. Another key issue is strengthening the working relationship between the workforce development system and UMCP. As Maryland's largest public university, UMCP is a core workforce development asset. The University is highly supportive of several key workforce development efforts. UMCP participates in summer youth hiring programs and works with the public school system; however, enhanced cooperation between the University and the workforce development system in linking its highly skilled and educated pool of students with the broader employer community is viewed as a key effort to improve the pipeline of skilled workers in the county.

Perspectives on Prince George's County Economic Readiness

In considering the potential for Prince George's County to maximize its industry growth potential, it is also important to consider more economic development-oriented indicators of how the county is positioned. The objective is to bring a "site location" consultant perspective to assess current economic development readiness and examine issues facing the county that will impact industry growth.

To assess the county's economic development readiness, the project team:

- Compared Prince George's County to the other counties that are within the region on a number of economic indicators.
- Analyzed industrial and commercial real estate market activity.
- Reviewed the county's key economic development programs, comparing the county's portfolio of programs to the programs found in other counties within the region.

Economic Indicators

In consultation with M-NCPPC, a wide range of key indicators were identified that suggest the strengths and weaknesses of Prince George's County from an economic development perspective. The economic indicators employed and the data used to measure them are shown in Table 33.

Table 33: Economic Indicators Used to Assess Economic Development in Prince George’s County

INDICATOR	RATIONALE	SOURCE OF DATA
Firm Birth and Death Rate relative to MSA and surrounding Counties 2005–2006	Measure of Economic Dynamism	U.S. Small Business Administration
Small Business Growth; ratio to adult population; labor force	Small Business Generation	U.S. Census
Minority and Women Owned Business Growth; ratio to adult population; labor force	Diversity of Businesses	U.S. Census (most current is 1997–2002)
Business Sales Tax Share	Contribution of Business Sector to Local Economy	MD Sales and Use Tax
Retail Sales Tax	View of Retail Activities	MD Sales and Use Tax
Hotel Tax Assessment Collections	Visitor Traffic	MD Sales and Use Tax
Federal Procurement Trend/Share of Region/Percentage of Businesses	Federal Purchasing	Federal Procurement Data System
Washington Area Coincident Index; Leading Index	Directional Growth of Regional Economy	George Mason University (develop a proxy for Prince George’s County)
Utility Costs	Attractiveness to Business	Sperling’s Best Places to Live (by city and town)
Tax Burdens	Attractiveness to Business	U.S. Census
Mass Transit Access	Attractiveness to Business	Sperling’s Best Places to Live (by city and town)
Crime Rates	Attractiveness to Business	U.S. Census
Education (Per student expenditure, student-teacher ratio)	Attractiveness to Business	Sperling’s Best Places to Live (by city and town)
Education Performance (HS Assessment, HS Graduation, # of schools cited for performance improvement)	Attractiveness to Business	MD State Department of Education

The economic development indicators point to an uneven position for Prince George’s County. Among the positives for the county were:

- A high percentage of small businesses operating in the county.
- A resilient level of retail spending in the face of adverse regional and national economic trends.
- Increased hotel tax collections due, in part, to development of National Harbor, suggesting a possible unmet demand for four-star hotels in the county.
- A sizable and growing base of federal procurement spending. The county ranks third in federal procurement dollars in the region, trailing only Montgomery and Fairfax counties. Over the last three years, federal procurement spending in Prince George’s County experienced a growth of 3.33 percent.
- Utility costs in the county are below the average among the comparison counties. Anne Arundel and Charles counties have above average utility costs.
- A high percentage of mass transportation users, and with the expansion of the Metrorail system with the addition of the Purple Line, even greater access will be provided.
- Prince George’s County’s high school dropout rate is the second lowest of the comparable counties.

Other indicators showed weaknesses in the county's economic development position, including:

- Low rate of new business starts, high rates of business deaths, and high contraction of existing businesses suggests internal issues within the county that are affecting business development.
- Comparatively low percentages of minority- and women-owned businesses.
- Agencies such as the USDA and NASA, which have significant presence within the county, face significant declines or flat budgets. This will impact the amount of funding available to purchase goods and services from other firms within the county.
- Despite trending with the region, Prince George's County performed below that of the region on the Washington Area Economic Index. This index is designed to forecast the performance of the Washington metro area's economy 6 to 8 months in advance.
- Prince George's County still has the highest crime rate among the comparison jurisdictions, although the county's overall crime rate has declined at a faster rate than in the comparison jurisdictions. Addressing the high crime rate remains a major concern for the business community.
- High school assessment pass rates and graduation rates remain lower in Prince George's County than in almost all comparison jurisdictions.

These indicators reduce the attractiveness of the county for potential employers.

Industrial and Commercial Real Estate Market Activity

In terms of commercial real estate activity overall, Prince George's County appears to be well-positioned for future growth, though vacancy rates are high in the short-term. Real estate indicators include:

- On the positive side, Prince George's County experienced a strong addition to the number of commercial square feet creating abundant choices in commercial space. New commercial construction increased in the county from 378,194 sq. ft. in 2000 to a high of 1,676,928 in 2008. The county had the third largest share of the region's new commercial space.
- Prince George's County's commercial vacancy rate has risen consistently since 2000 across retail, industrial, and office space. Retail vacancy rates appear to be reaching a plateau in 2010 at 12.6 percent, while the industrial vacancy rate is at a historic high of 39.3 percent. The office vacancy rate remains high in 2010 at 28.7 percent.
- The combination of recent gains in commercial real estate with rising vacancy rates has resulted in moderating lease rates since 2007. In 2007, average commercial leasing rates reached a high of 22.76 per sq. ft. and by 2010 had fallen to \$21.17 per sq. ft., a favorable economic development situation.

Economic Development Policies and Programs

The examination of the county's portfolio of economic development programs revealed that the county has a wide array of economic development efforts and initiatives underway, including:

- **PGEDC Business Outreach Program** – Prince George's County Economic Development Corporation (PGEDC) Business Outreach Program is designed to initiate a dialogue with the county's major employers, identify any specific needs, challenges, or opportunities that might be addressed by PGEDC or its partners, and make firms aware of the programs and services that are available to them. These include providing assistance with employee recruitment and training, business financing, procurement, and expansion.

- **Federal Alliances** – PGEDC works with several nonprofit community alliances that work to ensure that key federal research institutions and military installations in the county continue to remain strong economic assets. The following alliances have been established: NASA Goddard Alliance, National Agricultural Research Alliance-Beltsville, Andrews Business and Community Alliance, and Fort George G. Meade Alliance.
- **The Maryland Minority Research & Development Initiative (MMRDI)** – The objective of the MMRDI program, which is a partnership of PGEDC, Maryland Technology Development Corporation (TEDCO), and the Maryland Small Business Development Corporation at the University of Maryland, is to increase minority- and women-owned businesses' access to federal grants for early stage research and development projects. This is accomplished by providing targeted training and business assistance, pre-submission proposal reviews, and access to the equipment and expertise of the University of Maryland and the federal laboratories within the State of Maryland. The MMRDI initiative is specifically intended to empower minority entrepreneurs to more effectively compete for the highly selective Small Business Innovative Research and Small Business Technology Transfer (SBIR/STTR) federal grant awards program.
- The Prince George's County **Technology Assistance Center (TAC)** – TAC is an incubator program established to foster the creation and growth of early stage technology companies in the county.
- **High Technology Property Tax Credit (HTPT)** – Another tool that is used to make the county attractive for business development is HTPT. The HTPT was developed to encourage growth and development of existing high-technology companies and to attract new high-technology companies to the county. High technology refers to any business entity, including a developer who enters into a lease agreement with a high technology governmental agency, which is primarily involved with the applications of engineering, life sciences, computer sciences, research and development, or produces materials, parts, or equipment used in these types of applications. Eligible companies may receive a Real Property Tax Credit if they make at least a \$500,000 investment in 5,000 square feet or more of real property that is newly constructed or substantially improved by, or for, them and create at least 10 new full-time positions over a period of three years. The Real Property Tax Credit is phased in over a five year-period, beginning with a 100 percent exemption on the increased assessment in year one; 80 percent in year two; 60 percent in year three; 40 percent in year four; and 20 percent in year five.
- **Envision Prince George's** – Another initiative that is likely to have an impact on economic development in the county is Envision Prince George's, an initiative that is bringing county residents and businesses together to develop and implement a vision for the future. In March 2010, more than 1,000 people participated in a town meeting held by Envision Prince George's. The meeting capped more than 17 months of public engagement in identifying the county's key assets, opportunities, and challenges, input that was used to develop goals and a vision statement. A preliminary report containing the ideas and priorities generated at the town meeting was released in early 2011.

Many of the activities described above are well primed to serve the primary industry clusters found in Prince George's County. Table 34 shows which of the county's economic development programs best serve each industry cluster.

Table 34: Alignment of Prince George’s County Economic Development Efforts with Primary Industry Cluster Targets (Current Strength, Retention, and Emerging Opportunity Targets)

		Battelle Assessment of Fit of Ongoing Prince George’s County Key Economic Development Initiatives with Industry Clusters			
Economic Base Industry Clusters in Prince George’s County	Target Assessment	Business Visitation	Federal Alliances	High Tech Property Tax Credit	Incubator
Biosciences	Emerging Opportunity	X		X	X
Business Consulting Services	Emerging Opportunity	X	X		
Business Support Services	Current Strength	X	X		
Communications & Media Equipment	Emerging Strength	X		X	X
Computer & Peripheral Equipment	Additional Retention	X		X	X
Construction	Primary Retention	X			
Hospitals and Health Services	Emerging Opportunity	X			
Navigation & Control Instruments	Current Strength	X		X	X
Research, Development & Engineering Services	Additional Retention	X		X	X
Software & Computer Services	Additional Retention	X		X	X
Strategic Office Centers	Emerging Strength	X			
Traditional Print Media	Additional Retention	X			
Travel & Tourism	Emerging Strength	X			
Federal Government	Additional Retention	X		X	

The comparison of the county’s economic development programs to those found in other jurisdictions within the region identified one area in which the county seems to be lagging relative to its peers across the region. Currently, Baltimore County, Anne Arundel County, Howard County, Frederick County, Montgomery County, and Prince William County all provide some form of direct business lending and grants.



APPENDIX A: Detailed Industries within Industry Clusters

NAICS	Industry Cluster: AEROSPACE PRODUCTS & PARTS
336411	Aircraft manufacturing
336412	Aircraft engine and engine parts manufacturing
336413	Other aircraft parts and equipment
336414	Guided missile and space vehicle manufacturing
336415	Space vehicle propulsion units and parts manufacturing
336419	Other guided missile and space vehicle parts
NAICS	Industry Cluster: BIG BOX RETAIL
442110	Furniture stores
442299	All other home furnishings stores
443111	Household appliance stores
443112	Radio, TV, and other electronics stores
443120	Computer and software stores
444110	Home centers
448110	Men's clothing stores
448120	Women's clothing stores
448130	Children's and infants' clothing stores
448140	Family clothing stores
448150	Clothing accessories stores
448190	Other clothing stores
448210	Shoe stores
451110	Sporting goods stores
451211	Book stores
452111	Department stores, except discount
452910	Warehouse clubs and supercenters
452990	All other general merchandise stores
NAICS	Industry Cluster: BIOSCIENCES
541711	Research and development in biotechnology
541712*	Other physical and biological research
311221	Wet corn milling
311222	Soybean processing
311223	Other oilseed processing
325193	Ethyl alcohol manufacturing
325199	All other basic organic chemical manufacturing
325221	Cellulosic organic fiber manufacturing
325311	Nitrogenous fertilizer manufacturing
325312	Phosphatic fertilizer manufacturing
325314	Fertilizer, mixing only, manufacturing
325320	Pesticide and other agro-chemical manufacturing
325411	Medicinal and botanical manufacturing
325412	Pharmaceutical preparation manufacturing
325413	In-vitro diagnostic substance manufacturing
325414	Other biological product manufacturing
334510	Electromedical apparatus manufacturing

334516	Analytical laboratory instrument manufacturing
334517	Irradiation apparatus manufacturing
339112	Surgical and medical instrument manufacturing
339113	Surgical appliance and supplies manufacturing
339114	Dental equipment and supplies manufacturing
339115	Ophthalmic goods manufacturing
339116	Dental laboratories
541380*	Testing laboratories
621511	Medical laboratories
621512	Diagnostic imaging centers
NAICS	Industry Cluster: BUSINESS CONSULTING SERVICES
541611	Administrative management consulting services
541612	Human resources consulting services
541613	Marketing consulting services
541614	Process and logistics consulting services
541618	Other management consulting services
541620	Environmental consulting services
541690	Other technical consulting services
541820	Public relations agencies
NAICS	Industry Cluster: BUSINESS SUPPORT SERVICES
492210	Local messengers and local delivery
541930	Translation and interpretation services
561110	Office administrative services
561210	Facilities support services
561499	All other business support services
561612	Security guards and patrol services
561720	Janitorial services
NAICS	Industry Cluster: COMMUNICATIONS & MEDIA EQUIPMENT
334210	Telephone apparatus manufacturing
334220	Broadcast and wireless communications equipment
334290	Other communications equipment manufacturing
334310	Audio and video equipment manufacturing
335921	Fiber optic cable manufacturing
335929	Other communication and energy wire manufacturing
NAICS	Industry Cluster: COMPUTER & PERIPHERAL EQUIPMENT
334111	Electronic computer manufacturing
334112	Computer storage device manufacturing
334113	Computer terminal manufacturing
334119	Other computer peripheral equipment manufacturing
334611	Software reproducing
334612	Audio and video media reproduction
334613	Magnetic and optical recording media manufacturing
NAICS	Industry Cluster: CONSTRUCTION
23	Construction
NAICS	Industry Cluster: FINANCE & INSURANCE
52	Finance and insurance
NAICS	Industry Cluster: HIGHER EDUCATION
611210	Junior colleges

611310	Colleges and universities
NAICS	Industry Cluster: HOSPITALS & HEALTH SERVICES
621410	Family planning centers
621420	Outpatient mental health centers
621491	HMO medical centers
621492	Kidney dialysis centers
621493	Freestanding emergency medical centers
621498	All other outpatient care centers
621610	Home health care services
621910	Ambulance services
621991	Blood and organ banks
621999	Miscellaneous ambulatory health care services
622110	General medical and surgical hospitals
622210	Psychiatric and substance abuse hospitals
622310	Other hospitals
623110	Nursing care facilities
623210	Residential mental retardation facilities
623220	Residential mental and substance abuse care
NAICS	Industry Cluster: LEGAL
541110	Offices of lawyers
NAICS	Industry Cluster: MARKETING & ADVERTISING
511140	Directory and mailing list publishers
541430	Graphic design services
541810	Advertising agencies
541830	Media buying agencies
541840	Media representatives
541850	Display advertising
541860	Direct mail advertising
541870	Advertising material distribution services
541890	Other services related to advertising
541910	Marketing research and public opinion polling
541922	Commercial photography
NAICS	Industry Cluster: MEDIA SERVICES
512110	Motion picture and video production
512191	Teleproduction and postproduction services
512199	Other motion picture and video industries
512240	Sound recording studios
512290	Other sound recording industries
515111	Radio networks
515112	Radio stations
515120	Television broadcasting
515210	Cable and other subscription programming
NAICS	Industry Cluster: NAVIGATION & CONTROL INSTRUMENTS
334511	Search, detection, and navigation instruments
334512	Automatic environmental control manufacturing
334513	Industrial process variable instruments
334514	Totalizing fluid meters and counting devices
334515	Electricity and signal testing instruments
334516	Analytical laboratory instrument manufacturing

334517	Irradiation apparatus manufacturing
334518	Watch, clock, and part manufacturing
334519	Other measuring and controlling device manufacturing
NAICS	Industry Cluster: RESEARCH, DEVELOPMENT, & ENGINEERING SERVICES
541330	Engineering services
541712*	Other physical and biological research
NAICS	Industry Cluster: SEMICONDUCTORS & ELECTRONIC COMPONENTS
333295	Semiconductor machinery manufacturing
334411	Electron tube manufacturing
334412	Bare printed circuit board manufacturing
334413	Semiconductors and related device manufacturing
334414	Electronic capacitor manufacturing
334415	Electronic resistor manufacturing
334416	Electronic coils, transformers, and inductors
334417	Electronic connector manufacturing
334418	Printed circuit assembly manufacturing
334419	Other electronic component manufacturing
NAICS	Industry Cluster: SOFTWARE & COMPUTER SERVICES
511210	Software publishers
518210	Data processing, hosting and related services
541511	Custom computer programming services
541512	Computer systems design services
541513	Computer facilities management services
541519	Other computer related services
NAICS	Industry Cluster: STRATEGIC OFFICE CENTERS
551114	Managing offices
561422	Telemarketing and other contact centers
NAICS	Industry Cluster: TELECOMMUNICATIONS
517110	Wired telecommunications carriers
517210	Wireless telecommunications carriers
517410	Satellite telecommunications
517911	Telecommunications resellers
517919	All other telecommunications
519130	Internet publishing and web search portals
NAICS	Industry Cluster: TRADITIONAL PRINT MEDIA
323110	Commercial lithographic printing
511110	Newspaper publishers
511120	Periodical publishers
511130	Book publishers
519110	News syndicates
NAICS	Industry Cluster: TRANSPORTATION, DISTRIBUTION, & LOGISTICS
423110	Motor vehicle merchant wholesalers
423120	New motor vehicle parts merchant wholesalers
423130	Tire and tube merchant wholesalers
423140	Used motor vehicle parts merchant wholesalers
423210	Furniture merchant wholesalers
423220	Home furnishing merchant wholesalers
423310	Lumber and wood merchant wholesalers

423320	Masonry material merchant wholesalers
423330	Roofing and siding merchant wholesalers
423390	Other const. material merchant wholesalers
423410	Photographic equipment merchant wholesalers
423420	Office equipment merchant wholesalers
423430	Computer and software merchant wholesalers
423440	Other commercial equipment merchant wholesalers
423450	Medical equipment merchant wholesalers
423460	Ophthalmic goods merchant wholesalers
423490	Other professional equipment merchant wholesalers
423510	Metal merchant wholesalers
423520	Coal and other mineral merchant wholesalers
423610	Electric equipment and wiring merchant wholesalers
423620	Electric appliance merchant wholesalers
423690	Other electronic parts merchant wholesalers
423710	Hardware merchant wholesalers
423720	Plumbing equipment merchant wholesalers
423730	HVAC equipment merchant wholesalers
423740	Refrigeration equipment merchant wholesalers
423810	Construction equipment merchant wholesalers
423820	Farm and garden equipment merchant wholesalers
423830	Industrial machinery merchant wholesalers
423840	Industrial supplies merchant wholesalers
423850	Service estab. equipment merchant wholesalers
423860	Other transport. goods merchant wholesalers
423910	Sporting goods merchant wholesalers
423920	Toy and hobby goods merchant wholesalers
423930	Recyclable material merchant wholesalers
423940	Jewelry merchant wholesalers
423990	All other durable goods merchant wholesalers
424110	Printing and writing paper merchant wholesalers
424120	Office supplies merchant wholesalers
424130	Industrial paper merchant wholesalers
424210	Druggists' goods merchant wholesalers
424310	Piece goods merchant wholesalers
424320	Men's and boys' clothing merchant wholesalers
424330	Women's and children's clothing merchant wholesalers
424340	Footwear merchant wholesalers
424410	General line grocery merchant wholesalers
424420	Packaged frozen food merchant wholesalers
424430	Dairy product merchant wholesalers
424440	Poultry product merchant wholesalers
424450	Confectionery merchant wholesalers
424460	Fish and seafood merchant wholesalers
424470	Meat and meat product merchant wholesalers
424480	Fruit and vegetable merchant wholesalers
424490	Other grocery product merchant wholesalers
424510	Grain and field bean merchant wholesalers

424520	Livestock merchant wholesalers
424590	Other farm product raw material merchant wholesalers
424610	Plastics materials merchant wholesalers
424690	Other chemicals merchant wholesalers
424710	Petroleum bulk stations and terminals
424720	Other petroleum merchant wholesalers
424810	Beer and ale merchant wholesalers
424820	Wine and spirit merchant wholesalers
424910	Farm supplies merchant wholesalers
424920	Book and periodical merchant wholesalers
424930	Nursery and florist merchant wholesalers
424940	Tobacco and tobacco product merchant wholesalers
424950	Paint and supplies merchant wholesalers
424990	Other nondurable goods merchant wholesalers
425110	Business to business electronic markets
425120	Wholesale trade agents and brokers
481111	Scheduled passenger air transportation
481112	Scheduled freight air transportation
481211	Nonscheduled air passenger chartering
481212	Nonscheduled air freight chartering
481219	Other nonscheduled air transportation
482111	Line-haul railroads
482112	Short line railroads
483111	Deep sea freight transportation
483112	Deep sea passenger transportation
483113	Coastal and Great Lakes freight transport.
483114	Coastal and Great Lakes passenger transport.
483211	Inland water freight transportation
483212	Inland water passenger transportation
484110	General freight trucking, local
484121	General freight trucking, long-distance TL
484122	General freight trucking, long-distance LTL
484220	Other specialized trucking, local
484230	Other specialized trucking, long-distance
488111	Air traffic control
488119	Other airport operations
488190	Other support activities for air transport.
488210	Support activities for rail transportation
488310	Port and harbor operations
488320	Marine cargo handling
488330	Navigational services to shipping
488390	Other support activities for water transport.
488490	Other support activities for road transport.
488510	Freight transportation arrangement
488991	Packing and crating
488999	All other support activities for transport.
492110	Couriers and express delivery services
493110	General warehousing and storage

493120	Refrigerated warehousing and storage
493130	Farm product warehousing and storage
493190	Other warehousing and storage
NAICS	Industry Cluster: TRAVEL & TOURISM
487110	Scenic and sightseeing transportation, land
487210	Scenic and sightseeing transportation, water
487990	Scenic and sightseeing transportation, other
561510	Travel agencies
561520	Tour operators
561591	Convention and visitors bureaus
561599	All other travel arrangement services
561920	Convention and trade show organizers
712110	Museums
712120	Historical sites
712130	Zoos and botanical gardens
712190	Nature parks and other similar institutions
713110	Amusement and theme parks
713120	Amusement arcades
713210	Casinos, except casino hotels
713290	Other gambling industries
721110	Hotels and motels, except casino hotels
721120	Casino hotels
721191	Bed-and-breakfast inns
721199	All other traveler accommodation
NAICS	Industry Cluster: CONSTRUCTION
236115	New single-family general contractors
236116	New multifamily general contractors
236117	New housing operative builders
236118	Residential remodelers
236210	Industrial building construction
236220	Commercial building construction
237110	Water and sewer system construction
237120	Oil and gas pipeline construction
237130	Power and communication system construction
237210	Land subdivision
237310	Highway, street, and bridge construction
237990	Other heavy construction
238111	Residential poured foundation contractors
238112	Nonresidential poured foundation contractors
238121	Residential structural steel contractors
238122	Nonresidential structural steel contractors
238131	Residential framing contractors
238132	Nonresidential framing contractors
238141	Residential masonry contractors
238142	Nonresidential masonry contractors
238151	Residential glass and glazing contractors
238152	Nonresidential glass and glazing contractors
238161	Residential roofing contractors

238162	Nonresidential roofing contractors
238171	Residential siding contractors
238172	Nonresidential siding contractors
238191	Other residential exterior contractors
238192	Other nonresidential exterior contractors
238211	Residential electrical contractors
238212	Nonresidential electrical contractors
238221	Residential plumbing and HVAC contractors
238222	Nonresidential plumbing and HVAC contractors
238291	Other residential building equipment contractors
238292	Other nonresidential building equipment contract
238311	Residential drywall contractors
238312	Nonresidential drywall contractors
238321	Residential painting contractors
238322	Nonresidential painting contractors
238331	Residential flooring contractors
238332	Nonresidential flooring contractors
238341	Residential tile and terrazzo contractors
238342	Nonresidential tile and terrazzo contractors
238351	Residential finish carpentry contractors
238352	Nonresidential finish carpentry contractors
238391	Other residential finishing contractors
238392	Other nonresidential finishing contractors
238911	Residential site preparation contractors
238912	Nonresidential site preparation contractors
238991	All other residential trade contractors
238992	All other nonresidential trade contractors
NAICS	Industry Cluster: FINANCE & INSURANCE
521110	Monetary authorities——central bank
522110	Commercial banking
522120	Savings institutions
522130	Credit unions
522190	Other depository credit intermediation
522210	Credit card issuing
522220	Sales financing
522291	Consumer lending
522292	Real estate credit
522293	International trade financing
522294	Secondary market financing
522298	All other non-depository credit intermediation
522310	Mortgage and nonmortgage loan brokers
522320	Financial transaction processing and clearing
522390	Other credit intermediation activities
523110	Investment banking and securities dealing
523120	Securities brokerage
523130	Commodity contracts dealing
523140	Commodity contracts brokerage
523210	Securities and commodity exchanges

523910	Miscellaneous intermediation
523920	Portfolio management
523930	Investment advice
523991	Trust, fiduciary, and custody activities
523999	Miscellaneous financial investment activities
524113	Direct life insurance carriers
524114	Direct health and medical insurance carriers
524126	Direct property and casualty insurers
524127	Direct title insurance carriers
524128	Other direct insurance carriers
524130	Reinsurance carriers
524210	Insurance agencies and brokerages
524291	Claims adjusting
524292	Third party administration of insurance funds
524298	All other insurance related activities
525110	Pension funds
525120	Health and welfare funds
525190	Other insurance funds
525910	Open-end investment funds
525920	Trusts, estates, and agency accounts
525990	Other financial vehicles

*Includes only the relevant life sciences activities within the Biosciences and the remaining non-life science activities within Research, Development, & Engineering Services.



APPENDIX B: Summary of the Moderate to Large Changes in Occupational Staffing Over the 2008 to 2018 Period that Relate to Specific Industry Clusters for Prince George's County

Moderate to Large Change Factors in Occupational Utilization from BLS Crosswalked to Economic Base Industry Clusters in Prince George's County

Note: Moderate increase is 1.15–1.275%; Large increase is above 1.275%; Moderate decrease is 0.725–0.85%; Large decrease is less than 0.725%.

Occupation	Increase		Decrease		Explanation
	Large	Moderate	Large	Moderate	
ALL INDUSTRIES					
Compliance Officers		✓			More of these workers are required to ensure that firms are complying with regulations
Financial Examiners	✓				New federal regulations will increase demand for examiners
Computer Programmers				✓	Programming functions are increasingly automated and outsourced, reducing demand for these workers
Biomedical Engineers	✓				Demand grows for products that these workers develop from the results of biotechnology and medical research
Biochemists and biophysicists		✓			Job demand grows as biotechnology research increases
Medical Scientists		✓			These workers at the forefront of biotech research, which will be the force driving most science research, plus a large increase is expected in Federal grants
Telemarketers				✓	Organizations devote fewer resources to telemarketing and jobs are offshored
Switchboard Operators				✓	Advances in technology, such as voice recognition and internet directory assistance, movement to offshoring, the growth of cell phones and consolidation
Payroll and timekeeping clerks				✓	Organizations outsource payroll operations
Pharmacy Aides				✓	Job duties of these workers are increasingly handled by pharmacy technicians
Correspondence Clerks				✓	Automation continues to reduce the need for these workers

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Occupation	Increase		Decrease		Explanation
	Large	Moderate	Large	Moderate	
File Clerks			✓		Growing use of electronic files continues to lead to large workload declines
Order Clerks			✓		Duties of these workers are increasingly automated
Information and Record Clerks				✓	Work processes are automated and records and information are increasingly stored electronically
Data Entry Keyers				✓	Tasks are increasingly automated
Desktop Publishers				✓	Duties increasingly performed by workers in other occupations
Mail Clerks				✓	Duties are increasingly automated
Office Machine Operators				✓	Advances in technology allow other office workers to complete these duties
Office & Administrative Support Workers				✓	Technology makes these workers more efficient and tasks increasingly automated
Medical Equipment Repairers		✓			Use of medical equipment expands and advances lead to more sophisticated machines
Drilling and Boring Machine Tool Setters				✓	Tasks increasingly automated
Lathe and Turning Machine Tool Setters				✓	Companies retrofit old lathes and purchase new lathes that are computer controlled
Extruding and Forming Machine Setters				✓	Increased automation
MOST INDUSTRIES					
Network Systems & Data Communications Analysts	✓				Organizations continue to adopt the latest network technologies
Wieghers, Checkers, Samplers				✓	Use of radio-frequency identification technology increases productivity and automates tasks
Computer Operators			✓		As computers become smaller, more portable and more powerful, less need for workers to operate and maintain

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Occupation	Increase		Decrease		Explanation
	Large	Moderate	Large	Moderate	
Word Processors and Typists				✓	Other workers will complete word processing and typing tasks themselves
Computer-controlled Machine Tool Operators		✓			Computer controlled machinery is used for a larger share of metal and plastic work
Machine Feeders				✓	Automation and duties performed by others
SOFTWARE AND COMPUTER SERVICES CLUSTER					
Network and Computer Systems Administrators		✓			Demand will grow as many industries outsource systems administration
STRATEGIC OFFICE CENTERS CLUSTER					
Market Research Analysts	✓				Companies increasingly hire market and survey researchers to better understand and cater to consumer preferences
R&D AND ENGINEERING SERVICES CLUSTER					
Chemists				✓	Chemists will decline since life sciences rather than physical sciences is the primary driver of R&D industry
Survey Researchers	✓				Need to determine consumer preferences growing
MARKETING AND ADVERTISING CLUSTER					
Market Research Analysts	✓				Hiring of market and survey researchers grows to better understand and cater to consumer preferences
Commercial and Industrial Designers		✓			Many firms hire contractors from this industry rather than keep fully staffed design departments
Advertising Sales Agents		✓			New forms of technology lead to increased opportunities to sell ad space
TRADITIONAL PRINT MEDIA					
Graphic Designers		✓			Needed to work on web pages, which is growing in importance to traditional print media
AEROSPACE CLUSTER					
Materials Engineers		✓			Aerospace mfg remains at forefront in use of composites

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Occupation	Increase		Decrease		Explanation
	Large	Moderate	Large	Moderate	
HOSPITALS AND HEALTH SERVICES CLUSTER					
Substance Abuse Counselors		✓			Growing focus on sending drug abusers to rehab than jail
Mental Health Counselors	✓				Preferred over more expensive psychologists
Mental Health & Substance Abuse Workers		✓			Address growing demand for rehab services for drug abusers
Dietitians and Nutritionists				✓	Contracting out of dietitian services by health facilities
Home Health Aides		✓			More outpatient services
Maids and Housekeeping Cleaners				✓	Maid services increasingly outsourced
First Line Supervisors				✓	Indirect result of increases in the number of home health aides
Recreation Workers		✓			Increased demand for recreation services by older persons
BIOSCIENCES CLUSTER					
Medical and Clinical Lab Technologists		✓			Outsourcing from hospitals and physician offices
Medical and Clinical Lab Technicians		✓			Outsourcing from hospitals and physician offices
CONSTRUCTION CLUSTER					
Electricians				✓	Electrician helpers gain a larger share of the industry
Sheet Metal Workers				✓	Duties performed by other construction workers
Electrical and Electronics Repairers		✓			New regulations require sprinkler systems in all residential buildings
COMPUTER & PERIPHERAL EQUIPMENT					

Moderate to Large Change Factors in Occupational Utilization from BLS Crosswalked to Economic Base Industry Clusters in Prince George's County

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Occupation	Increase		Decrease		Explanation
	Large	Moderate	Large	Moderate	
Electrical and Electronics Repairers				✓	Increasingly off-shored
TRANSPORTATION, DISTRIBUTION AND LOGISTICS					
Cargo and Freight Agents		✓			Many firms reduce inventory in favor of just-in-time business model
Aircraft Cargo Handling Supervisors				✓	Fewer checked bags due to airline rules changes
Laborers and Freight, Stock and Material Movers				✓	Duties become automated
Truck Loaders				✓	More efficient loading methods decrease employment

BLS, Factors Affecting Occupational Utilization, 2008–2018.

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