The Talent Development Pipeline Study

Prepared by:
The Baltimore Workforce Investment Board's Committee on Training and Post-Secondary Education
The Baltimore region is a vibrant, sophisticated urban center where long-enduring businesses thrive, side-by-side with emerging industry sectors built on cutting edge technology. As home to some of the finest post-secondary institutions in the world, our region is uniquely positioned to accommodate the workforce needs of our diverse industrial base. The role these educational institutions play in preparing a workforce with the occupational expertise required to support such an expansive range of industries cannot be overstated. The Talent Development Pipeline Study illuminates the connections between the supply of qualified workers and occupational demand, and will surely serve as an invaluable tool for calibrating the dynamic relationship between a world-class workforce and a globally competitive economic base. We are pleased to offer this resource to stakeholders throughout the Baltimore region!

THE TALENT DEVELOPMENT PIPELINE STUDY

Stephanie Rawlings-Blake  
Mayor of Baltimore City

John W. Ashworth, III  
Chairman, Baltimore Workforce Investment Board  
Senior Vice President Network Development, University of Maryland Medical System and  
Associate Dean, University of Maryland School of Medicine
When I was asked to contribute a foreword for this important report I accepted without pause because the honesty reflected in these pages is refreshing. Supply and demand ‘gap’ analysis is fraught with challenges of two types—technical and explanatory. The authors have delivered a clear and accurate description of their statistical estimates. They have done an admirable, and regrettably unusual, job of warning readers to heed the limitations of ‘gap’ estimates.

The content of this volume is rich. Each reader must decide what counsel to take away for personal or organizational use. There is much to be absorbed before deciding how to combine this new information with other decision-relevant knowledge. Salient observations about estimated gaps between projected business needs and the rate, level and composition of emerging student flows will be processed in a context of sustained economic turbulence and uncertainty.

I liken this document to a Frommer’s or Fodor’s travel guide. Pity the traveler to a new destination that misses spontaneous opportunities to explore because ‘it is not in the guide’. Many of us have seen tourists still poring over a guide as they pass by natural wonders, architectural gems and interesting interactions among people. Like the travel guides, this study is intended to inform an exploration of options; it is not an instruction manual.

I take issue with two concepts found throughout this study—finding fault because these concepts divert attention from the high value of the new information delivered. The phrase talent development pipeline conveys a sense of one-way flow through a closed delivery system. And the phrase career ladder is visualized as a rigid vertical assembly of steps to ascend to a new height. Each of these phrases is accurate and useful in some cases, but I propose complementary phrasing for adoption in other applications of the information found here.

As a complement to pipeline, consider the relevance of a soaking hose that has many exit points, or off-ramps in the authors’ language. And, in addition to career ladder, consider visualization of regional institutional learning opportunities as a climbing wall, as in a recreational fitness facility—many, and changeable, routes to self-defined destinations. In each case this alternative phrasing concentrates attention on the openness of the area’s educational institutions to personal decisions about entry and exit timing, achievement and return.

I urge readers to beware of a recession bias. There is a common perception that local hiring has ‘dried up’, which is mistaken and unfortunate. I often hear anecdotal evidence that individuals of all ages have revisited their educational aspirations and decisions based on popular media treatments of recession impacts. But, as Annie sings, “the sun’ll come out tomorrow” and youths and adults alike will be wise to bet their bottom dollar that educational attainment will open doors, as it has in the past.

David W. Stevens, Ph.D.
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May 2010
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Amassing and synthesizing the information contained in the Talent Development Pipeline Study was an
ambitious undertaking. This draft represents many hours of dedicated service on the part of the Baltimore
Workforce Investment Board’s Training and Post-Secondary Education Committee members, who gener-
ously shared their time and talents as leaders in the Baltimore community.

Many thanks are also due to the Performance and Evaluation Data Support Division at the Mayor’s Office
of Employment Development for contributing expertise in statistical analysis; David W. Stevens, Director of
The Jacob France Institute and Research Professor of Economics Merrick School of Business University
of Baltimore, who provided the committee with invaluable feedback and guidance during the development
of the project.

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Introduction

The Purpose of the Talent Development Pipeline Study

In today's technologically advanced and globally competitive business climate, organizations need skilled workers more than ever. Institutions of higher education are key contributors to the pipeline of qualified workers. Recognizing the critical link between access to quality educational programming and a vibrant regional economy, the Baltimore Workforce Investment Board (BWIB) created the Training and Post-Secondary Education (TPSE) Committee in 2007.

Baltimore's post-secondary educational infrastructure is exceptionally strong. The region is fortunate to be the home to numerous high-quality - and in some cases, internationally renowned - institutes of higher education. These institutions play a vital role in preparing Marylanders for advanced technical careers in the plethora of federal government agencies and private businesses that sustain the greater Baltimore/Washington D.C. corridor's economy. Moreover, the business of delivering post-secondary education is intensely competitive. The ability to dynamically respond to occupational demand with well-aligned programming is an essential value proposition in the educational marketplace.

But is the educational programming currently available in our region meeting the mark?

Despite the rising unemployment rate, business leaders continue to report that they struggle to find workers equipped with the skill sets they need to keep their businesses operating at peak performance. This suggests a disconnect somewhere. To discover where such disconnects may be occurring, the committee conducted a gap analysis to assess whether local colleges, universities and trade schools are preparing students for the kinds of jobs available here in the Baltimore region. The major goals of the analysis were to:

- Determine the availability and capacity of educational programming currently offered at regional post-secondary institutions;
- Identify high demand occupations in the Baltimore region that fall within six of the BWIB's targeted industry sectors (not including government jobs);
- Compare the number of graduates in selected professional disciplines to the number of projected job openings that will require related educational preparation.

Extensive research was conducted to evaluate the above-noted points, including a comprehensive examination of regional post-secondary educational programming, and a thorough analysis of labor market projections for Baltimore City and Baltimore County. Results of the Committee's analysis have been compiled in *The Talent Development Pipeline Study* (TDPS), a document that provides a broad-brush picture of the comparative relationship between the supply of graduates from regional post-secondary educational institutions and occupational demand across six industry sectors targeted by the BWIB. The committee used the collected findings to derive data-driven recommendations directed at achieving greater congruence between the supply of skilled workers and local occupational demand.
How is the Talent Development Pipeline Study Organized?

Report Structure

Building better connections between and among business and educational institutions is a key priority of the Baltimore Workforce Investment Board (BWIB). To meet this aim, the BWIB’s Training and Post-Secondary Education Committee has conducted a gap analysis to assess whether local colleges, universities and trade schools are preparing students for the kinds of jobs available here in the Baltimore region. Results of the Committee’s analysis have been organized into six independent reports, each focused on a single industry sector targeted by the BWIB. The structure of every industry sector report is consistently ordered according to the description below.

<table>
<thead>
<tr>
<th>TDPS Report Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supply Side Summary</strong></td>
</tr>
<tr>
<td>The <strong>Supply Side Summary</strong> answers the questions:</td>
</tr>
<tr>
<td>- Which jobs are included in the analysis for this industry sector?</td>
</tr>
<tr>
<td>- How many post-secondary programs are available in the Baltimore region that prepare students for work in industry sector-related occupations?</td>
</tr>
<tr>
<td>- How many people are enrolled in these programs?</td>
</tr>
<tr>
<td>- What levels of educational attainment do graduates possess upon graduation?</td>
</tr>
<tr>
<td><strong>Demand Side Summary</strong></td>
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<td>The <strong>Demand Side Summary</strong> answers the questions:</td>
</tr>
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<td>- How many jobs in the industry sector are projected for the Baltimore region in 2016?</td>
</tr>
<tr>
<td>- What levels of educational attainment are most commonly required for these jobs?</td>
</tr>
<tr>
<td>- Which industry sector-related occupations are projected to see the greatest increase in the number of jobs, and what levels of education are typically required to qualify for these jobs?</td>
</tr>
<tr>
<td><strong>How To Use This Tool</strong></td>
</tr>
<tr>
<td>The <strong>How To Use This Tool</strong> section answers the questions:</td>
</tr>
<tr>
<td>- Who are some of the major audiences who can benefit from the information contained in the report?</td>
</tr>
<tr>
<td>- What are some suggested uses of the Study?</td>
</tr>
<tr>
<td>- What are some specific tasks each audience can perform with the Study?</td>
</tr>
<tr>
<td><strong>Appendix</strong></td>
</tr>
</tbody>
</table>

**Industry Sectors**

The TDPS takes a sectoral approach to the gap analysis, focusing on six industry sectors targeted by the BWIB. The industry sectors examined in this Study are:
Industry Sectors

The TDPS takes a sectoral approach to the gap analysis, focusing on six industry sectors targeted by the BWIB. The industry sectors examined in this Study are:

- Bioscience
- Business Services
- Computer, Internet, and Software-Related Data Services
- Construction
- Healthcare and Social Assistance
- Hospitality and Tourism

Notes:

* The Port and Port-Related jobs sector was not analyzed as part of the Study, due to the fact that the nature of training necessary for occupations in this area will require a different approach to our research. It is the BWIB’s intent at this time to defer this industry sector to a future date.
* The Sustainable Energy and Environmentally-Driven Services sector was not added to the BWIB’s list of targeted industries until 2009, after extensive work on this Study had already begun. Moreover, as this is a still-emerging industry sector, it was agreed that the BWIB would be best served by waiting to conduct any research, until its full occupational scope became more evident.
* Government jobs are not included in the study since BWIB industry definitions don’t include NAICS codes for governmental organizations.

Grouping Occupations

Occupations in each industry sector were grouped at two levels. The larger grouping encompasses the broad universe of all of the opportunities with a presence in an industry sector. A smaller sub-set of this universe of jobs is referred to in the Study as the “core” occupations.
How to Use This Tool

While the Talent Development Pipeline Study was designed to serve a wide range of audiences, four major audiences are shown in the graphic below, with suggestions for how the Study can facilitate research and inform strategic planning.

<table>
<thead>
<tr>
<th>Who?</th>
<th>What?</th>
<th>How?</th>
</tr>
</thead>
</table>
| High School and Post-Secondary Guidance Counselors, Parents and Students | Academic and Career Planning | • Explore regional educational and career options.  
• Identify occupations that are expected to grow in demand in the Baltimore region.  
• Locate post-secondary educational programs in the Baltimore region linked to career preparation.  
• Compare the enrollment and graduation rates of programs within a training discipline at all of the regional post-secondary institutions. |
| Educational Institutions | Educational Program Development | • Assess the alignment of current curriculum with workforce trends.  
• Expand or modify educational programming to prepare workers for projected workforce needs.  
• Guide strategic resource development efforts. |
| Workforce Professionals and Job Seekers | Career Exploration and Job Training | • Identify occupations that are projected to grow in demand in the Baltimore region.  
• Explore a range of regionally available training options for career preparation.  
• Evaluate opportunities for short, medium, and long-term training programs in high-demand careers. |
| Businesses | Recruitment of Qualified Workers | • Identify post-secondary institutions producing qualified workers.  
• Alert employers to current or projected gaps between the supply of qualified graduates and occupational demand.  
• Partner with post-secondary institutions to address improve the alignment between programming and industry needs. |

Note: Audiences who might benefit from using the research provided in this study are not limited to those shown in the above graphic. Further, the Study can be used in many creative ways not included among the ideas suggested.
Methodology

Supply Side Data Sources

Data on enrollment and graduation rates was drawn from two reports published annually by the Maryland Higher Education Commission’s Office of Policy Analysis and Research:


The Committee developed a series of questions to frame and guide the research that underpinned this Study:

- What geographical area would the committee include in the “Baltimore Region”?
- What post-secondary degrees are associated with the targeted industry sectors?
- Which post-secondary educational institutions in the Baltimore region offer these degrees?
- What levels of degrees are offered?
- How many students are enrolled in and are graduating at each level of educational attainment?

Defining the “Baltimore Region”

The committee elected to include post-secondary training venues in the Baltimore region based on four criteria:

1) Geographic proximity to Baltimore City and Baltimore County;

2) “Statewide Program” status - these are community college programs offering a curriculum that is unique within the entire state. Maryland residents from any county can attend at in-county tuition rates;

3) “2+2” status – This term refers to programs comprising either the first or second two years of a four year college degree. A subset of educational institutions are included in the Study which, while falling outside of the Baltimore City/Baltimore County lines, offer the second two years of a 4-year college degree program at a “receiving” institution for transfer students from local community colleges; and/or

4) Professionally recognized apprenticeship programs in targeted industries. (Apprenticeships were only considered in the Construction and Energy industry sector.)
**Data Organization**

Educational programs were categorized into one of the six industry sectors targeted by the BWIB; Biosciences, Business Services, Computer, Internet and Software Related Data Services, Construction, Healthcare and Social Assistance and Hospitality and Tourism.

**Training Venues**

Below is a listing of the Post-Secondary institutions included in the Baltimore Region:

### Educational Institutions

<table>
<thead>
<tr>
<th>Anne Arundel Community College</th>
<th>Coppin State University</th>
<th>Morgan State University</th>
<th>University of Baltimore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baltimore City Community College</td>
<td>Goucher College</td>
<td>Sojourner-Douglass College</td>
<td>University of Maryland at Baltimore</td>
</tr>
<tr>
<td>Baltimore International College</td>
<td>Howard Community College</td>
<td>Stevenson University (formerly Villa Julie College)</td>
<td>University of Maryland Baltimore County</td>
</tr>
<tr>
<td>Capitol College</td>
<td>ITT Technical Institute</td>
<td>Tai Sophia Institute</td>
<td>University of Maryland Eastern Shore</td>
</tr>
<tr>
<td>College of Notre Dame of Maryland</td>
<td>Johns Hopkins University</td>
<td>TESST College of Technology</td>
<td>University of Maryland University College</td>
</tr>
<tr>
<td>Community College of Baltimore County</td>
<td>Loyola College</td>
<td>Towson State University</td>
<td></td>
</tr>
</tbody>
</table>

### Apprenticeship Professions

In addition to community colleges, colleges, and universities, numerous apprenticeship programs were identified at a variety of locations in the Baltimore region. The programs included in the Study are all formally registered with the Maryland State Department of Labor, Licensing and Regulation, and span a range of professions. The list below illustrates the spectrum of professions for which apprenticeship programs are identified. *(Apprenticeships are only noted in the Construction sector.)*

<table>
<thead>
<tr>
<th>Asbestos Workers</th>
<th>Elevator Constructors</th>
<th>Road Sprinkler Fitters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiler Makers</td>
<td>HVAC Technicians</td>
<td>Roofers</td>
</tr>
<tr>
<td>Bricklayers</td>
<td>Ironworkers</td>
<td>Sheet Metal Workers</td>
</tr>
<tr>
<td>Carpenters</td>
<td>Painters</td>
<td>Sprinkler Fitters</td>
</tr>
<tr>
<td>Electricians</td>
<td>Plumbers</td>
<td>Steamfitters</td>
</tr>
</tbody>
</table>
The DLLR-approved apprenticeship programs cited in the study were selected on the basis of their geographic proximity to Baltimore. The Director of DLLR’s Apprenticeship and Training Programs office – John P. Taylor - provided the numbers included in the study.

Levels of Educational Attainment Referenced in the Study
Post-secondary education has unfortunately often been narrowly defined as a four year college degree. There is growing recognition among educators and employers alike that a robust workforce needs employees trained at a range of levels to perform the full scope of work required in most businesses. Therefore, the committee included pathways to employment with on-ramps and off-ramps at multiple points along the educational continuum. The various educational levels at which information for the Study was collected follow:

**Lower Division Certificate**
The Lower Division Certificate is a themed grouping of lower-level post-secondary coursework, most commonly offered by community colleges. LDC’s typically consist of 12 – 15 credits which are usually focused on technical training. Post-secondary vocational training also falls into this category.

**Apprenticeship**
The duration and requirements of skilled trades apprenticeships vary with each profession. Apprenticeships typically include both coursework and work-based learning.

**A.A.S.**
The Associates of Applied Science (A.A.S.) is a terminal professional two-year degree offered through community colleges, designed to prepare students for immediate employment upon completion. While some coursework completed as part of the 60 – 70 credit A.A.S. degree may transfer to four-year educational institutions, employment is the focus.

**A.A.**
The Associates of Arts (A.A.) degree usually requires completion of 62 – 65 credits of academic work at a community college. The A.A. is designed with articulation agreements in place to facilitate transfer to four-year educational institutions.

**B.A./B.S.**
The Bachelors of Arts / Bachelors of Science degrees traditionally require completion of at least 120 hours of prescribed coursework. Depending on the discipline, the B.A. and B.S. can prepare employees for work or continuing education.

**Master’s**
A Bachelors is almost always a pre-requisite for entrance into a Masters program, also called a “Graduate Degree”. Earning a Masters usually involves completion of approximately 36 credit hours of coursework. For many fields, the Masters is a terminal degree.

**Upper Division Certificates**
As improving technology increases the complexities within professions, the value of certification for specialized advanced training is gaining popularity. Advanced certifications, variably referred to by post-secondary institutions as “Post-Baccalaureate Certificates”, “Advanced Certificates”, and “Upper Division Certificates” are offered as subsets of graduate programs, or as extensions beyond graduate-level work that do not yet rise to the level of doctoral work.
 Demand Side

Methodology for Aligning Occupations with BWIB Industry Sectors

SOC – The 2000 Standard Occupational Classification (SOC) system is used by Federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data. All workers are classified into one of over 820 occupations according to their occupational definition.

NAICS – The North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.

Governor’s Workforce Investment Board (GWIB) determines industry sectors by creating lists of NAICS codes for each sector. However, the Department of Labor provides estimates for employment changes within each occupational (SOC) category. Thus, DOL also developed 2008 National NAICS industry-specific occupational estimates that show how many people were employed within each industry sector in each occupational category. So, for example, they provide data on how many managers were employed in transportation industry sector.

Having this data allowed us to compute the number of employees in each industry sector by occupational category, nationally, and derive the percent of jobs within a particular occupational category attributed to each industry. In other words, we calculated the percent of managers employed in transportation industry category in total number of all the managers employed nationally in 2008.

Then, we applied these percentages to the Baltimore City and Baltimore County occupational 2016 projections developed by DOL. After that, we looked at the Occupational Projections and Training Data from the Bureau of Labor Statistics and used Educational attainment cluster system to single out occupations that in 2006 (most recent available) required at least some college or college degree.

As a result, we came up with a list of occupational categories for each industry sector for Baltimore City and Baltimore County combined that require at least some college or college education. The data for each category included: number of employees in 2006, projected number of employees in 2016, percentage change in demand and volume change in demand.

To analyze the change in demand for employees in each industry cluster we looked at the total number of employees projected to be needed by 2016 including turnover effect. To develop a list of occupations that will see the largest increase in demand, we computed a volume increase in demand (or percent increase in demand). Also, in order to be able to compare the increase in demand to the number of

Ph.D. / M.D. Both degrees represent extended academic coursework beyond the Masters level. Completion of the degree program usually requires at least three years of

1st Professional 1st Professional degrees usually require at least six years of full-time equivalent academic study, including college study prior to entering the professional degree program. These degrees are associated particularly with certain licensed

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graduates in relevant programs, we combined demand for employees in core (for this industry) major occupational groups.

The Construction Industry sector required a departure from the Study methodology used in other sectors. The construction sector is unique in its reliance on state-approved apprenticeship programs to prepare skilled trades workers, who are central to much of the work performed. Business leaders in the industry used their judgment and created a list of occupations from the list of all occupations existing in Baltimore City and Baltimore County. Then, using DLLR’s list of apprenticeships, we identified which occupations need apprenticeship training. Thus, to compute the demand for construction jobs, projected demand for occupations requiring apprenticeship and higher education were summed up.

**Study Limitations**

No collection of data (or consequential analysis) will ever be flawless. The information presented in this report will prove to be no exception to that rule. Therefore, the reader should bear certain caveats in mind as they consider the content contained in the Talent Development Pipeline Study.

**Supply Side Data**

The data collected on Enrollments and Degrees Granted was drawn from annual performance reports published by the Maryland Higher Education Commission. These numbers are a valuable indicator of programming trends and capacity at the reviewed institutions. However, there are some important limitations to extrapolating definitive assumptions from these measures. David Stevens of the Jacob France Institute, who reviewed the supply-side portion of the Study, observed several issues:

1. Viewing enrollments as a stable indicator of the pipeline of trained workers is problematic, since many people never complete programs in which they've enrolled, either because they switch to a different major or because they leave the institution.

2. Even among those who do earn a degree in a given discipline, there is no guarantee that they will end up working in that field.

3. People come from around the nation—and the world— to attend Baltimore’s prestigious post-secondary institutions. Unfortunately, Baltimore is notoriously “porous”, in terms of keeping graduates in our region once they’ve completed their schooling.

4. Educational programs were sorted into the targeted industry sectors based on the “Code for Instructional Programming” (CIP) system used to identify programs by subject focus. In some instances where the choice was not clear, subjective judgment was applied.

**Demand Side Data**

1. Current LMI data, issued by Maryland’s Department of Labor, Licensing and Regulation (DLLR) in July of 2009, covers the time span from 2006—2016. Projections for 2016 were based on 2006 data. Consequently, the impact of the recession may not be fully reflected in these numbers.

2. The most authoritative sources were used to determine the levels of educational attainment required for occupations. But this data should be accepted as an indicator of trends, not a definitive statement. There are some instances where requirements are rigid and constant—to be a medical doctor, for example, one must earn a medical degree. There are many occupations, though, where experience is
applied as a substitute for some portion of education. In such instances, the Study focuses on the level of education held by the largest percentage of those working in an occupation.
Industry Sector: Bioscience

Prepared by:
The Baltimore Workforce Investment Board’s Committee on Training and Post-Secondary Education
Introduction

Building better connections between and among business and educational institutions is a key priority of the Baltimore Workforce Investment Board (BWIB). To meet this aim, the BWIB’s Training and Post-Secondary Education Committee has conducted a gap analysis to assess whether local colleges, universities and trade schools are preparing students for the kinds of jobs available here in the Baltimore region. Results of the Committee’s analysis have been organized into six independent reports, each focused on a single industry sector targeted by the BWIB. The structure of every industry sector report is consistently ordered according to the description below.

Bioscience Report Structure

Supply Side Summary

The Supply Side Summary answers the questions:
- Which jobs are included in the analysis for this industry sector?
- How many post-secondary programs are available in the Baltimore region that prepare students for work in Bioscience-related occupations?
- How many people are enrolled in these programs?
- What levels of educational attainment are graduates coming out of school with?

Demand Side Summary

The Demand Side Summary answers the questions:
- How many jobs in Bioscience are projected for the Baltimore region in 2016?
- What levels of educational attainment are most commonly required for these jobs?
- Which Bioscience-related occupations are projected to see the greatest increase in the number of employees, and what levels of education are typically required to qualify for these jobs?

How To Use This Tool

The How To Use This Tool section answers the questions:
- Who are some of the major audiences who can benefit from the information contained in the report?
- What are some suggested uses of the Study?
- What are some specific tasks each audience can perform with the Study?

Appendix

Supply Side Data
Inventory of post-secondary educational programs focused on preparing workers for Bioscience-related occupations

Demand Side Data
Current and projected labor market projections and related educational requirements for high demand occupations in Bioscience
The BWIB has adopted a system used by federal agencies to sort business establishments into industry sectors, based on commonalities in the goods they produce, services they deliver, or activities they perform. Occupational demand within industry sectors is calculated using national estimates for the number of people employed within industries in each occupational category. BWIB has associated specific occupational categories to industry sectors based on the degree to which these occupations support the core business activities in the sector. The graphic below illustrates the relationship between the BWIB’s definition for the industry sector and the associated core occupational categories.

**The Supply Side—Connecting the Industry Sector to Occupations**

**BWIB’s Definition for the Bioscience Industry Sector**

The BWIB Bioscience sector includes industries that are "biology driven". Their activity substantially involves research, development or manufacture of the following:

- Biologically active molecules
- Devices that employ or affect biological processes
- Biological information resources

*Within this broad definition, the target sector includes the following employers:*

- Private sector (Bioscience companies - R&D, Service and Manufacturing, Testing labs such as Quest Diagnostics, and Hospital Labs such as University of Maryland Medical Center);
- Higher Education (University research labs);
- Federal Labs (such as National Institutes of Health); and
- Research Institutes

**Core Occupational Categories within the Bioscience Industry Sector**

- Life, Physical, and Social Sciences
- Architecture and Engineering
- Computer and Mathematical
- Healthcare Support

**The Supply Side—Regional Post-Secondary Programming**

**Student Enrollments**

The Maryland Higher Education Commission collects data annually to track statewide student enrollment in post-secondary programs. Based on the most recently published report for 2008, 6,718 students were enrolled in programs designed to prepare workers for a range of Bioscience-related careers.

**Current Regional Availability of Bioscience-related Programs**

Lower Division Certificate Programs: 3
A.A.S. / A.A.’ Program: 4
B.A./B.S. Programs: 32
Masters Programs: 24
Upper Division Certificates: 5
Ph.D / MD Programs: 20

**Number of 2008 Graduates in Bioscience-Related Programs**

1,353

Data Sources: Maryland Higher Education Commission—2008 Reports on Annual Trends in Enrollment by Program and Trends in Degrees and Certificates by Program—Available online at: http://www.mhec.state.md.us/Publications/research/index.asp
The Demand Side—Projected High-Demand Occupations

The table below notes the top ten jobs in the Bioscience industry sector, by the projected increase in the total number of openings in 2016 (including turnover effect). The occupations below were derived from the entire universe of all Bioscience jobs.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>2006 Jobs, City and County Combined</th>
<th>Number of Jobs Projected in 2016</th>
<th>Total Openings in 2016</th>
<th>Percent Increase</th>
<th>Educational Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Engineers</td>
<td>1,300</td>
<td>1,512</td>
<td>558</td>
<td>42.89%</td>
<td>Bachelor's Degree</td>
</tr>
<tr>
<td>Management Analysts</td>
<td>2,022</td>
<td>2,078</td>
<td>403</td>
<td>19.92%</td>
<td>Bachelor's Degree</td>
</tr>
<tr>
<td>Architects, Except Landscape and Naval</td>
<td>914</td>
<td>1,067</td>
<td>324</td>
<td>35.41%</td>
<td>Bachelor's Degree</td>
</tr>
<tr>
<td>Biological Technicians</td>
<td>385</td>
<td>446</td>
<td>199</td>
<td>51.58%</td>
<td>Bachelor's Degree</td>
</tr>
<tr>
<td>General and Operations Managers</td>
<td>676</td>
<td>650</td>
<td>174</td>
<td>25.77%</td>
<td>Bachelor's Degree</td>
</tr>
<tr>
<td>Surveyors</td>
<td>289</td>
<td>357</td>
<td>155</td>
<td>53.42%</td>
<td>Bachelor's Degree</td>
</tr>
<tr>
<td>Architectural and Civil Drafters</td>
<td>468</td>
<td>488</td>
<td>153</td>
<td>32.76%</td>
<td>Post-Secondary Vocational Award</td>
</tr>
<tr>
<td>Environmental Scientists and Specialists, including Health</td>
<td>236</td>
<td>301</td>
<td>126</td>
<td>53.21%</td>
<td>Master's Degree</td>
</tr>
<tr>
<td>Medical Scientists, Except Epidemiologists</td>
<td>305</td>
<td>331</td>
<td>120</td>
<td>39.32%</td>
<td>Doctoral Degree</td>
</tr>
<tr>
<td>Computer Systems Analysts</td>
<td>219</td>
<td>275</td>
<td>114</td>
<td>51.91%</td>
<td>Bachelor's Degree</td>
</tr>
</tbody>
</table>

Data Sources: Baltimore City WIA and Baltimore County WIA Occupational Projections 2006-2016 - Total openings include openings created through turnover.

The Demand Side—Jobs and Educational Requirements

3,074 Number of Projected Job Openings in Core Bioscience-Related Occupations in 2016

Educational Attainment Requirements for Core Bioscience-Related Occupations

The Top Ten list in the table above takes into account all of the jobs with a numerical presence in the industry sector. In contrast, the pie-chart to the left includes a subset of that broad universe of occupations considered to be “core”, or focused on industry specific expertise.

To identify gaps between the supply of graduates prepared to fill industry “core” occupations and the demand for jobs requiring similar levels of educational preparation, compare the pie chart to the left with the Supply Side pie chart on the opposing page.

Recommendations

Based on the findings, the Committee makes the following recommendations:

◊ A more detailed comparative analysis of specific educational programs and in-demand occupations should be conducted to assess the degree to which program availability is satisfying business needs.

◊ Partnerships should be formed between education and the public and private sectors to create more internship programs, work-study programs, and hands-on learning experience for both high school age and college age students, to accelerate their ability to gain work experience and to apply it in a meaningful environment.

◊ Stronger coordination is needed among high schools, community colleges and Bachelors programs to assure seamless, integrated and non-redundant preparation for continuous career advancement in bioscience.

◊ Local industry and industry organizations should be invited to participate in discussions about industry training needs.

◊ Industry standardization of required competencies for different job levels would strengthen the preparation of workers.

◊ Shorter-term training for middle-skill jobs should receive the support of regional workforce agencies.

◊ Representatives from the Bioscience industry sector that reviewed this report recommend follow-up analysis to capture the near-term employment growth anticipated in emerging regional Bioscience companies.
How to Use This Tool

While the Talent Development Pipeline Study was designed to serve a wide range of audiences, four major audiences are shown in the graphic below, with suggestions for how the Study can be used to facilitate research and inform strategic planning.

<table>
<thead>
<tr>
<th>Who?</th>
<th>What?</th>
<th>How?</th>
</tr>
</thead>
</table>
| High School and Post-Secondary Guidance Counselors, Parents and Students | Academic and Career Planning | - Explore regional educational and career options.  
- Identify occupations that are expected to grow in demand in the Baltimore region.  
- Locate post-secondary educational programs in the Baltimore region linked to career preparation.  
- Compare the enrollment and graduation rates of programs within a training discipline at all of the regional post-secondary institutions. |
| Educational Institutions | Educational Program Development | - Assess the alignment of current curriculum with workforce trends.  
- Expand or modify educational programming to prepare workers for projected workforce needs.  
- Guide strategic resource development efforts. |
| Workforce Professionals and Job Seekers | Career Exploration and Job Training | - Identify occupations that are projected to grow in demand in the Baltimore region.  
- Explore a range of regionally available training options for career preparation.  
- Evaluate opportunities for short, medium, and long-term training programs in high-demand careers. |
| Businesses | Recruitment of Qualified Workers | - Identify post-secondary institutions producing qualified workers.  
- Alert employers to current or projected gaps between the supply of qualified graduates and occupational demand.  
- Partner with post-secondary institutions to address improve the alignment between programming and industry needs. |

*Note: Audiences who might benefit from using the research provided in this study are not limited to those shown in the above graphic. Further, the Study can be used in many creative ways not included among the ideas suggested.*
Industry Sector: Business Services

Prepared by:
The Baltimore Workforce Investment Board’s Committee on Training and Post-Secondary Education
Introduction

Building better connections between and among business and educational institutions is a key priority of the Baltimore Workforce Investment Board (BWIB). To meet this aim, the BWIB’s Training and Post-Secondary Education Committee has conducted a gap analysis to assess whether local colleges, universities and trade schools are preparing students for the kinds of jobs available here in the Baltimore region. Results of the Committee’s analysis have been organized into six independent reports, each focused on a single industry sector targeted by the BWIB. The structure of every industry sector report is consistently ordered according to the description below.

### Business Services Report Structure

<table>
<thead>
<tr>
<th>Demand Side Summary</th>
<th>Supply Side Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>The <strong>Supply Side Summary</strong> answers the questions:</td>
<td>The <strong>Demand Side Summary</strong> answers the questions:</td>
</tr>
<tr>
<td>• Which jobs are included in the analysis for this industry sector?</td>
<td>• How many jobs in Business Services are projected for the Baltimore region in 2016?</td>
</tr>
<tr>
<td>• How many post-secondary programs are available in the Baltimore region that prepare students for work in Business Services-related occupations?</td>
<td>• What levels of educational attainment are most commonly required for these jobs?</td>
</tr>
<tr>
<td>• How many people are enrolled in these programs?</td>
<td>• Which Business Services-related occupations are projected to see the greatest increase in the number of employees, and what levels of education are typically required to qualify for these jobs?</td>
</tr>
<tr>
<td>• What levels of educational attainment are graduates coming out of school with?</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How To Use This Tool</th>
</tr>
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<tr>
<td>The <strong>How To Use This Tool</strong> section answers the questions:</td>
</tr>
<tr>
<td>• Who are some of the major audiences who can benefit from the information contained in the report?</td>
</tr>
<tr>
<td>• What are some suggested uses of the Study?</td>
</tr>
<tr>
<td>• What are some specific tasks each audience can perform with the Study?</td>
</tr>
</tbody>
</table>

### Appendix

<table>
<thead>
<tr>
<th>Supply Side Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inventory of post-secondary educational programs focused on preparing workers for Business Services-related occupations</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Demand Side Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current and projected labor market projections and related educational requirements for high demand occupations in Business Services</td>
</tr>
</tbody>
</table>
The BWIB has adopted a system used by federal agencies to classify business establishments into industry sectors, based on commonalities in the goods they produce, services they deliver, or activities they perform. To connect industry sectors to occupational demand, national estimates were developed for how many people were employed within each industry in each occupational category. The graphic below illustrates the relationship between the BWIB’s definition for the Business Services industry sector and the core occupational categories that form the current staffing pattern within the industry sector.

**BWIB’s Definition for the Business Services Industry Sector**

BWIB includes the following industries in the **Business Services Sector**:

- Accounting, Tax Preparation, Bookkeeping, and Payroll Services;
- Management Consulting Services;
- Advertising and Related Services;
- Management of Companies and Enterprises (except government establishments) that administer, oversee, and manage establishments of the company or enterprise and that normally undertake the strategic or organizational planning and decision-making role of the company or enterprise; and
- Administrative and Support Services

**Core Occupational Categories within the Business Services Industry Sector**

- Management
- Business and Financial Operations
- Office and Administrative Support
- Legal

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**The Supply Side—Connecting the Industry Sector to Occupations**

The Supply Side—Connecting the Industry Sector to Occupations

**The Supply Side—Regional Post-Secondary Programming**

**Student Enrollments**

The Maryland Higher Education Commission collects data annually to track statewide student enrollment in post-secondary programs. Based on the most recently published report for 2008, **34,022** students were enrolled in programs designed to prepare workers for a range of Business Services-related careers.

**Current Regional Availability of Business Services-related Post-Secondary Programs**

- Lower Division Certificate Programs: 37
- A.A.S. / A.A. Program: 33
- B.A./B.S. Programs: 37
- Masters Programs: 37
- Upper Division Certificates: 47
- Ph.D Programs: 3
- 1st Professional: 4

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*Data Sources: Maryland Higher Education Commission—2008 Reports on Annual Trends in Enrollment by Program and Trends in Degrees and Certificates by Program—Available online at: http://www.mhec.state.md.us/Publications/research/index.asp*
The Demand Side—Projected High-Demand Occupations

The table below notes the top ten jobs in the Business Services industry sector, by the projected increase in the total number of openings in 2016 (including turnover effect). The occupations below were derived from the entire universe of all Business Services jobs.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>2006 Jobs, City and County Combined</th>
<th>Number of Jobs Projected in 2016</th>
<th>Total Openings in 2016</th>
<th>Increase in Demand</th>
<th>Educational Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lawyers</td>
<td>4502</td>
<td>4868</td>
<td>1224</td>
<td>27.2%</td>
<td>1st Professional Degree</td>
</tr>
<tr>
<td>Accountants and Auditors</td>
<td>3205</td>
<td>3612</td>
<td>972</td>
<td>30.3%</td>
<td>Bachelor’s Degree</td>
</tr>
<tr>
<td>Marketing Managers</td>
<td>2648</td>
<td>2544</td>
<td>682</td>
<td>25.8%</td>
<td>Bachelor’s Degree or Higher, Plus Experience</td>
</tr>
<tr>
<td>Computer Systems Analysts</td>
<td>1268</td>
<td>1590</td>
<td>658</td>
<td>51.9%</td>
<td>Bachelor’s Degree</td>
</tr>
<tr>
<td>Management Analysts</td>
<td>3280</td>
<td>3372</td>
<td>654</td>
<td>19.9%</td>
<td>Bachelor’s Degree or Higher, Plus Experience</td>
</tr>
<tr>
<td>Civil Engineers</td>
<td>1348</td>
<td>1567</td>
<td>578</td>
<td>42.9%</td>
<td>Bachelor’s Degree</td>
</tr>
<tr>
<td>Paralegals and Legal Assistants</td>
<td>2434</td>
<td>2684</td>
<td>568</td>
<td>23.3%</td>
<td>Associate’s Degree</td>
</tr>
<tr>
<td>Network Systems and Data Communications Analysts</td>
<td>965</td>
<td>1288</td>
<td>519</td>
<td>53.8%</td>
<td>Bachelor’s Degree or Higher</td>
</tr>
<tr>
<td>Computer Software Engineers, Applications</td>
<td>852</td>
<td>1174</td>
<td>445</td>
<td>52.3%</td>
<td>Bachelor’s Degree or Higher</td>
</tr>
<tr>
<td>Computer Support Specialists</td>
<td>1161</td>
<td>1206</td>
<td>439</td>
<td>37.8%</td>
<td>Associate’s Degree</td>
</tr>
</tbody>
</table>

Data Sources: Baltimore City WIA and Baltimore County WIA Occupational Projections 2006-2016 - Total openings include openings created through turnover.

The Demand Side—Jobs and Educational Requirements

6,314 Number of Projected Job Openings in Core Business Services-Related Occupations in 2016

Educational Attainment Requirements for Core Business Services Occupations

To identify gaps between the supply of qualified workers and occupational demand for jobs requiring similar levels of educational preparation, compare the pie chart to the left with the pie chart on the opposing page.

Recommendations

Based on the findings, the Committee makes the following recommendations:

The report indicates general alignment between the availability of post-secondary education and the educational requirements associated with projected high-demand occupations, however,

◊ A more detailed comparative analysis of specific educational programs and in-demand occupations should be conducted to assess the degree to which program availability is satisfying business needs.

◊ Workforce entities should target training opportunities for the middle-skilled occupations, positioning individuals to move up the career ladder to related higher-level occupations that also appear in the Top Ten list.

◊ The pipeline of high school students gaining skills and experience in accounting and finance-related careers should be strengthened by forming collaborative partnerships that bring together local companies and youth in summer youth employment and internship opportunities.

◊ In addition, accounting and finance firms should visit schools, particularly those already operating finance-related academic programs, to speak with students about the field and how their education will support what they do on the job.
# How to Use This Tool

While the Talent Development Pipeline Study was designed to serve a wide range of audiences, four major audiences are shown in the graphic below, with suggestions for how the Study can be used to facilitate research and inform strategic planning.

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<tr>
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- Locate post-secondary educational programs in the Baltimore region linked to career preparation.  
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- Guide strategic resource development efforts. |
| Workforce Professionals and Job Seekers | Career Exploration and Job Training | - Identify occupations that are projected to grow in demand in the Baltimore region.  
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| Businesses | Recruitment of Qualified Workers | - Identify post-secondary institutions producing qualified workers.  
- Alert employers to current or projected gaps between the supply of qualified graduates and occupational demand.  
- Partner with post-secondary institutions to address improve the alignment between programming and industry needs. |

Note: Audiences who might benefit from using the research provided in this study are not limited to those shown in the above graphic. Further, the Study can be used in many creative ways not included among the ideas suggested.
Industry Sector: Computer, Internet and Software-Related Data Services

Prepared by:
The Baltimore Workforce Investment Board’s Committee on Training and Post-Secondary Education
**Computer, Internet and Software-Related Data Services**

**Introduction**

Building better connections between and among business and educational institutions is a key priority of the Baltimore Workforce Investment Board (BWIB). To meet this aim, the BWIB’s Training and Post-Secondary Education Committee has conducted a gap analysis to assess whether local colleges, universities and trade schools are preparing students for the kinds of jobs available here in the Baltimore region. Results of the Committee’s analysis have been organized into six independent reports, each focused on a single industry sector targeted by the BWIB. The structure of every industry sector report is consistently ordered according to the description below.

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<thead>
<tr>
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<th>Demand Side Summary</th>
<th>How To Use This Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>The <strong>Supply Side Summary</strong> answers the questions:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Which jobs are included in the analysis for this industry sector?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ How many post-secondary programs are available in the Baltimore region that prepare students for work in Computer, Internet and Software-Related Data Services-related occupations?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ How many people are enrolled in these programs?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ What levels of educational attainment are graduates coming out of school with?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The <strong>Demand Side Summary</strong> answers the questions:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ How many jobs in Computer, Internet and Software-Related Data Services are projected for the Baltimore region in 2016?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ What levels of educational attainment are most commonly required for these jobs?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Which Computer, Internet and Software-Related Data Services-related occupations are projected to see the greatest increase in the number of employees, and what levels of education are typically required to qualify for these jobs?</td>
<td></td>
<td></td>
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<td>The <strong>How To Use This Tool</strong> section answers the questions:</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>▪ What are some specific tasks each audience can perform with the Study?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Appendix**

**Supply Side Data**  
Inventory of post-secondary educational programs focused on preparing workers for Computer, Internet and Software-Related Data Services-related occupations

**Demand Side Data**  
Current and projected labor market projections and related educational requirements for high demand occupations in Computer, Internet and Software-Related Data Services
The Supply Side—Connecting the Industry Sector to Occupations

The BWIB has adopted a system used by federal agencies to sort business establishments into industry sectors, based on commonalities in the goods they produce, services they deliver, or activities they perform. Occupational demand within industry sectors is calculated using national estimates for the number of people employed within industries in each occupational category. BWIB has associated specific occupational categories to industry sectors based on the degree to which these occupations support the core business activities in the sector. The graphic below illustrates the relationship between the BWIB’s definition for the industry sector and the associated core occupational categories.

BWIB’s Definition for the Computer, Internet and Software-Related Data Services Industry Sector

Core Occupational Categories within the Computer, Internet and Software-Related Data Services Industry Sector

- Architecture and Engineering
- Arts, Design, Entertainment, Sports and Media
- Computer and Mathematical
- Management

The BWIB includes the following occupational areas in the Computer, Internet and Software-Related Data Services Industry Sector:

- Internet Publishing and Broadcasting;
- Internet Service Providers and Web Search Portals, and Data Processing Services;
- Computer Facilities management Services (including establishments primarily engaged in providing on-site management and operation of clients’ computer systems and/or data processing facilities as well as establishments providing computer systems or data processing facilities support services).

The Supply Side—Regional Post-Secondary Programming

Student Enrollments

The Maryland Higher Education Commission collects data annually to track statewide student enrollment in post-secondary programs. Based on the most recently published report for 2008, 16,337 students were enrolled in programs designed to prepare workers for a range of Computer, Internet and Software-Related Data Services careers.

Current Regional Availability of Computer, Internet and Software-Related Data Services Post-Secondary Programs

Lower Division Certificate Programs: 3
A.A.S. / A.A. Program: 4
B.A./B.S. Programs: 32
Masters Programs: 24
Upper Division Certificates: 5
Ph.D / MD Programs: 20

Number of 2008 Graduates in Computer, Internet and Software-Related Data Services Programs

Number of 2008 Graduates in Computer, Internet and Software-Related Data Services Programs in 2008 by Educational Level

Data Sources: Maryland Higher Education Commission—2008 Reports on Annual Trends in Enrollment by Program and Trends in Degrees and Certificates by Program—Available online at: http://www.mhec.state.md.us/Publications/research/index.asp
The table below notes the top ten jobs in the Computer, Internet and Software-Related Data Services industry sector, by the projected increase in the total number of openings in 2016 (including turnover effect). The occupations below were derived from the entire universe of all Computer jobs.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>2006 Jobs, City and County Combined</th>
<th>Number of Jobs Projected in 2016</th>
<th>Total Openings in 2016</th>
<th>Increase in Demand</th>
<th>Educational Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer systems analysts</td>
<td>939</td>
<td>1178</td>
<td>487</td>
<td>51.9%</td>
<td>Bachelor's</td>
</tr>
<tr>
<td>Computer software engineers, applications</td>
<td>713</td>
<td>983</td>
<td>373</td>
<td>52.3%</td>
<td>Bachelor's</td>
</tr>
<tr>
<td>Network systems and data communications analysts</td>
<td>630</td>
<td>841</td>
<td>339</td>
<td>53.8%</td>
<td>Bachelor's</td>
</tr>
<tr>
<td>Computer support specialists</td>
<td>831</td>
<td>863</td>
<td>314</td>
<td>37.8%</td>
<td>Associates Degree</td>
</tr>
<tr>
<td>Computer specialists, all other</td>
<td>801</td>
<td>774</td>
<td>212</td>
<td>26.5%</td>
<td>Associates Degree</td>
</tr>
<tr>
<td>Computer software engineers, systems software</td>
<td>525</td>
<td>641</td>
<td>192</td>
<td>36.6%</td>
<td>Bachelor's</td>
</tr>
<tr>
<td>Computer programmers</td>
<td>926</td>
<td>840</td>
<td>192</td>
<td>20.7%</td>
<td>Bachelor's</td>
</tr>
<tr>
<td>Network and computer systems administrators</td>
<td>417</td>
<td>513</td>
<td>190</td>
<td>45.6%</td>
<td>Bachelor's</td>
</tr>
<tr>
<td>General and operations managers</td>
<td>678</td>
<td>651</td>
<td>175</td>
<td>25.8%</td>
<td>Bachelor's Degree or Higher</td>
</tr>
<tr>
<td>Management analysts</td>
<td>649</td>
<td>667</td>
<td>129</td>
<td>19.9%</td>
<td>Bachelor's Degree or Higher</td>
</tr>
</tbody>
</table>

Data Sources: Baltimore City WIA and Baltimore County WIA Occupational Projections 2006-2016 - Total openings include openings created through turnover.

The Demand Side—Projected High-Demand Occupations

The table below notes the top ten jobs in the Computer, Internet and Software-Related Data Services industry sector, by the projected increase in the total number of openings in 2016 (including turnover effect). The occupations below were derived from the entire universe of all Computer jobs.

The Demand Side—Jobs and Educational Requirements

Number of Projected Job Openings in Core Computer, Internet and Software-Related Data Services Occupations in 2016

Educational Attainment Requirements for Core Computer, Internet and Software-Related Data Services Occupations

The Top Ten list in the table above takes into account all of the jobs with a numerical presence in the industry sector. In contrast, the pie-chart to the left includes a subset of that broad universe of occupations considered to be “core”, or focused on industry specific expertise.

To identify gaps between the supply of graduates prepared to fill industry “core” occupations and the demand for jobs requiring similar levels of educational preparation, compare the pie chart to the left with the Supply Side pie chart on the opposing page.

Recommendations

Based on the findings, the Committee makes the following recommendations:

◊ A more detailed comparative analysis of specific educational programs and in-demand occupations should be conducted to assess the degree to which program availability is satisfying business needs.

◊ Representatives from the education and business communities should partner in efforts to increase the number of students pursuing related Associate and Bachelor’s-level degrees, in order to close the gap between the number of graduates and the projected employment demand.

◊ Science, Technology, Engineering and Math (STEM) related programs should be widely adopted at the middle-school and high school levels in order to increase in the number of students pursuing computer degrees upon entry into college.

◊ Partnerships should be formed between education and the public and the private sectors to create more internship programs, work-study programs and hands on learning experience for both high school age and college age students, to accelerate their ability to gain work experience and to apply it in a meaningful environment.

◊ Post secondary institutions should add value to their educational programs by providing students with opportunities to gain industry-standard technical certifications and licenses as a part of their degreed programs. This could be accomplished through closer partnerships between research institutions and the private sector, to make sure that the degree programs are staying current with the demands of the industry.

◊ The incredible speed with which technological advances emerge demands a highly agile response from the educational community at every level. Curriculum development and the institutional approval processes required to implement new programs should be reviewed and streamlined, to facilitate rapid deployment of new training programs.

◊ Up-skilling incumbent workers to ensure that they maintain their competitive edge in the marketplace should be an important focus of the continuing education departments of regional community colleges.
How to Use This Tool

While the Talent Development Pipeline Study was designed to serve a wide range of audiences, four major audiences are shown in the graphic below, with suggestions for how the Study can be used to facilitate research and inform strategic planning.

**Who?**

- **High School and Post-Secondary Guidance Counselors, Parents and Students**
  - Academic and Career Planning
  - Explore regional educational and career options.
  - Identify occupations that are expected to grow in demand in the Baltimore region.
  - Locate post-secondary educational programs in the Baltimore region linked to career preparation.
  - Compare the enrollment and graduation rates of programs within a training discipline at all of the regional post-secondary institutions.

- **Educational Institutions**
  - Educational Program Development
  - Assess the alignment of current curriculum with workforce trends.
  - Expand or modify educational programming to prepare workers for projected workforce needs.
  - Guide strategic resource development efforts.

- **Workforce Professionals and Job Seekers**
  - Career Exploration and Job Training
  - Identify occupations that are projected to grow in demand in the Baltimore region.
  - Explore a range of regionally available training options for career preparation.
  - Evaluate opportunities for short, medium, and long-term training programs in high-demand careers.

- **Businesses**
  - Recruitment of Qualified Workers
  - Identify post-secondary institutions producing qualified workers.
  - Alert employers to current or projected gaps between the supply of qualified graduates and occupational demand.
  - Partner with post-secondary institutions to address improve the alignment between programming and industry needs.

**What?**

- **High School and Post-Secondary Guidance Counselors, Parents and Students**
- **Educational Institutions**
- **Workforce Professionals and Job Seekers**
- **Businesses**

**How?**

Note: Audiences who might benefit from using the research provided in this study are not limited to those shown in the above graphic. Further, the Study can be used in many creative ways not included among the ideas suggested.
Industry Sector: Construction

Prepared by:
The Baltimore Workforce Investment Board’s Committee on Training and Post-Secondary Education
Introduction

Building better connections between and among business and educational institutions is a key priority of the Baltimore Workforce Investment Board (BWIB). To meet this aim, the BWIB’s Training and Post-Secondary Education Committee has conducted a gap analysis to assess whether local colleges, universities and trade schools are preparing students for the kinds of jobs available here in the Baltimore region. Results of the Committee’s analysis have been organized into six independent reports, each focused on a single industry sector targeted by the BWIB. The structure of every industry sector report is consistently ordered according to the description below.

Construction

Introduction

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Construction Report Structure

The Supply Side Summary answers the questions:
- Which jobs are included in the analysis for this industry sector?
- How many post-secondary programs are available in the Baltimore region that prepare students for work in Construction-related occupations?
- How many people are enrolled in these programs?
- What levels of educational attainment are graduates coming out of school with?

The Demand Side Summary answers the questions:
- How many jobs in Construction are projected for the Baltimore region in 2016?
- What levels of educational attainment are most commonly required for these jobs?
- Which Construction-related occupations are projected to see the greatest increase in the number of employees, and what levels of education are typically required to qualify for these jobs?

The How To Use This Tool section answers the questions:
- Who are some of the major audiences who can benefit from the information contained in the report?
- What are some suggested uses of the Study?
- What are some specific tasks each audience can perform with the Study?

Appendix

Supply Side Data
Inventory of post-secondary educational programs focused on preparing workers for Construction-related occupations

Demand Side Data
Current and projected labor market projections and related educational requirements for high demand occupations in Construction
The Supply Side—Connecting the Industry Sector to Occupations

A meaningful analysis of the relationship between the supply of trained workers and occupational demand in the Construction industry sector required a departure from the methodology used in other sectors. From a supply perspective, the construction sector is unique in its reliance on state-approved apprenticeship programs as a key component of post-secondary training. Industry leaders also recommended an alternative approach to evaluating demand, in order to place special focus on high-demand skilled trades occupations. The broad-based BWIB industry definition for Construction is shown below. The universe of occupations included in the data sets for this sector was selected by business leaders in the industry.

BWIB’s Definition for the Construction Industry Sector

The Construction sector comprises establishments primarily engaged in the construction of buildings or engineering projects. Construction work done may include new work, additions, alterations, or maintenance and repairs. Activities of these establishments generally are managed at a fixed place of business, but they usually perform construction activities at multiple project sites. Production responsibilities for establishments in this sector are usually specified in: 1) contracts with the owners of construction projects (prime contracts) or 2) contracts with other construction establishments (subcontracts).

The Supply Side—Regional Post-Secondary Programming

Student Enrollments

Data was drawn from two sources to determine enrollments. MHEC enrollment numbers for 2008 provided data on regional post-secondary institutions, at which 5,290 students were enrolled in Construction-related post-secondary programs. Maryland’s Department of Labor, Licensing, and Regulation, which collects annual data on state-approved apprenticeship programs, indicates that 3,569 individuals were registered in apprenticeship programs in 2007. Combining the two sources, 8,859 students were enrolled in programs designed to prepare workers for a range of Construction-Related careers.

Current Regional Availability of Construction-related Programs

Lower Division Certificate Programs: 24
Apprenticeships: 35
A.A.S. / A.A. Program: 23
B.A./B.S. Programs: 18
Masters Programs: 16
Upper Division Certificates: 4
Ph.D / MD Programs: 7

Data Sources: Maryland Higher Education Commission—2008 Reports on Annual Trends in Enrollment by Program and Trends in Degrees and Certificates by Program—Available online at: http://www.mhec.state.md.us/Publications/research/index.asp
The Demand Side—Projected High-Demand Occupations

The table below notes the top ten jobs in the Construction industry sector, by the projected increase in the total number of openings in 2016 (including turnover effect). The occupations below were derived from the entire universe of all Construction jobs.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>2006 Jobs, City and County Combined</th>
<th>Number of Jobs Projected in 2016</th>
<th>Total Openings in 2016</th>
<th>Percent Increase</th>
<th>Educational Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carpenters</td>
<td>6470</td>
<td>7845</td>
<td>2250</td>
<td>34.8%</td>
<td>Apprenticeship</td>
</tr>
<tr>
<td>Construction Laborers</td>
<td>6580</td>
<td>7710</td>
<td>1700</td>
<td>25.8%</td>
<td>Moderate-term on-the-job training</td>
</tr>
<tr>
<td>Construction Managers</td>
<td>3535</td>
<td>4385</td>
<td>1400</td>
<td>39.6%</td>
<td>Bachelor's degree</td>
</tr>
<tr>
<td>First-Line Supervisors/Managers of Construction Trades and Extraction Workers</td>
<td>4270</td>
<td>4890</td>
<td>1230</td>
<td>28.8%</td>
<td>Work experience in a related occupation</td>
</tr>
<tr>
<td>Electricians</td>
<td>3585</td>
<td>3840</td>
<td>1225</td>
<td>34.2%</td>
<td>Apprenticeship</td>
</tr>
<tr>
<td>Plumbers, Pipefitters, and Steamfitters</td>
<td>3065</td>
<td>3515</td>
<td>1080</td>
<td>35.2%</td>
<td>Apprenticeship</td>
</tr>
<tr>
<td>Civil Engineers</td>
<td>2425</td>
<td>2820</td>
<td>1040</td>
<td>42.9%</td>
<td>Bachelor's degree</td>
</tr>
<tr>
<td>Painters, Construction and Maintenance</td>
<td>2085</td>
<td>2260</td>
<td>585</td>
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<tr>
<td>Sheet Metal Workers</td>
<td>1460</td>
<td>1645</td>
<td>545</td>
<td>37.3%</td>
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<tr>
<td>Operating Engineers and Other Construction Equipment Operators</td>
<td>1385</td>
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Data Sources: Baltimore City WIA and Baltimore County WIA Occupational Projections 2006-2016. Total openings include openings created through turnover.

The Demand Side—Jobs and Educational Requirements

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Educational Attainment Requirements for Core Construction Occupations

To identify gaps between the supply of graduates prepared to fill industry “core” occupations and the demand for jobs requiring similar levels of educational preparation, compare the pie chart to the left with the Supply Side pie chart on the opposing page.

Recommendations

Based on the findings, the Committee makes the following recommendations:

◊ An independent study needs to be done to look at supply and demand in the Construction Trades. Trades people such as Welders, Ironworkers, Carpenters, Operating Engineers, Pipefitters and Plumbers make up a critical part of the construction and energy industry sector, and as such, should be the focus of additional examination.

◊ Study results indicate that a gap exists in a number of industry sectors. This information needs to be shared with local Colleges and Universities. We believe we should be doing everything we can to grow and educate individuals in our own community in order that they will stay in the community for their entire careers. For example there needs to be a major effort to produce more Civil Engineers locally to fill the projected needs. The number of Civil Engineers produced by local Colleges and Universities is woefully inadequate.

◊ Efforts to improve the perception of professions in the skilled trades as a respected and financially rewarding career choice should be supported.

◊ Increased support should be made available to expand enrollment in the Career and Technology Education completer programs offered in secondary educational institutions. Curricula standards should be fully aligned with industry-recognized credentials.

◊ Study data reveal that full four-year undergraduate programs in Construction Management are offered only on a very limited basis in the State of Maryland. While there are a number of Community Colleges offering two-year Associates degrees in this field, there needs to be a more convenient and readily accessible means of transferring from these programs to full Bachelor’s programs.

◊ Likewise, the study results for projected labor market demand indicate a major need for General and Operations Managers. Industry representatives who reviewed the study confirm that management-level construction and energy occupations typically require a combination of technical and management skill sets. Colleges and Universities in the region that offer management-related Masters programs in should reach out to students graduating with Bachelor’s degrees in technical disciplines.

◊ In summary, there needs to be an on going dialogue developed between the stakeholders, to include private industry (such as Construction Companies, Energy Companies, Civil Design Firms, etc.) and regional higher education institutions to more closely align educational programming in quality and quantity with industry needs.
How to Use This Tool

While the Talent Development Pipeline Study was designed to serve a wide range of audiences, four major audiences are shown in the graphic below, with suggestions for how the Study can be used to facilitate research and inform strategic planning.

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• Identify occupations that are expected to grow in demand in the Baltimore region.  
• Locate post-secondary educational programs in the Baltimore region linked to career preparation.  
• Compare the enrollment and graduation rates of programs within a training discipline at all of the regional post-secondary institutions. |
| Educational Institutions | Educational Program Development | • Assess the alignment of current curriculum with workforce trends.  
• Expand or modify educational programming to prepare workers for projected workforce needs.  
• Guide strategic resource development efforts. |
| Workforce Professionals and Job Seekers | Career Exploration and Job Training | • Identify occupations that are projected to grow in demand in the Baltimore region.  
• Explore a range of regionally available training options for career preparation.  
• Evaluate opportunities for short, medium, and long-term training programs in high-demand careers. |
| Businesses | Recruitment of Qualified Workers | • Identify post-secondary institutions producing qualified workers.  
• Alert employers to current or projected gaps between the supply of qualified graduates and occupational demand.  
• Partner with post-secondary institutions to address improve the alignment between programming and industry needs. |

Note: Audiences who might benefit from using the research provided in this study are not limited to those shown in the above graphic. Further, the Study can be used in many creative ways not included among the ideas suggested.
Industry Sector: Healthcare and Social Assistance

Prepared by:
The Baltimore Workforce Investment Board’s Committee on Training and Post-Secondary Education
Healthcare and Social Assistance

Introduction

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Healthcare and Social Assistance Report Structure

Supply Side Summary

The Supply Side Summary answers the questions:
- Which jobs are included in the analysis for this industry sector?
- How many post-secondary programs are available in the Baltimore region that prepare students for work in Healthcare and Social Assistance-related occupations?
- How many people are enrolled in these programs?
- What levels of educational attainment are graduates coming out of school with?

Demand Side Summary

The Demand Side Summary answers the questions:
- How many jobs in Healthcare and Social Assistance are projected for the Baltimore region in 2016?
- What levels of educational attainment are most commonly required for these jobs?
- Which Healthcare and Social Assistance-related occupations are projected to see the greatest increase in the number of employees, and what levels of education are typically required to qualify for these jobs?

How To Use This Tool

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Appendix

Supply Side Data
Inventory of post-secondary educational programs focused on preparing workers for Healthcare and Social Assistance-related occupations

Demand Side Data
Current and projected labor market projections and related educational requirements for high demand occupations in Healthcare and Social Assistance
The Supply Side—Connecting the Industry Sector to Occupations

The BWIB has adopted a system used by federal agencies to sort business establishments into industry sectors, based on commonalities in the goods they produce, services they deliver, or activities they perform. Occupational demand within industry sectors is calculated using national estimates for the number of people employed within industries in each occupational category. BWIB has associated specific occupational categories to industry sectors based on the degree to which these occupations support the core business activities in the sector. The graphic below illustrates the relationship between the BWIB’s definition for the industry sector and the associated core occupational categories.

BWIB’s Definition for the Healthcare and Social Assistance Industry Sector

BWIB defines the Healthcare and Social Assistance industry sector as one which includes establishments providing health care and social assistance for individuals. Trained professionals deliver the services provided by establishments in this sector. Many Healthcare and Social Assistance positions are defined based on the educational degree held by the practitioners included in the industry.

Core Occupational Categories within the Healthcare and Social Assistance Industry Sector

- Business and Financial Operations
- Community and Social Services
- Computer and Mathematical
- Healthcare Practitioners and Technical
- Healthcare Support
- Legal Occupations
- Life, Physical and Social Science
- Management

The Supply Side—Regional Post-Secondary Programming

Student Enrollments

The Maryland Higher Education Commission collects data annually to track statewide student enrollment in post-secondary programs. Based on the most recently published report for 2008, 27,315 students were enrolled in programs designed to prepare workers for a range of Healthcare/Social Assistance-related careers.

Current Regional Availability of Healthcare and Social Assistance-related Post-Secondary Programs

Lower Division Certificate Programs: 47
A.A.S./A.A. Programs: 49
B.A./B.S. Programs: 47
Master’s Programs: 64
Upper Division Certificates: 31
Ph.D./MD Programs: 53

Data Sources: Maryland Higher Education Commission—2008 Reports on Annual Trends in Enrollment by Program and Trends in Degrees and Certificates by Program—Available online at: http://www.mhec.state.md.us/Publications/research/index.asp
The Demand Side—Projected High-Demand Occupations

The table below notes the top ten jobs in the Healthcare and Social Assistance industry sector, by the projected increase in the total number of openings in 2016 (including turnover effect). The occupations below were derived from the entire universe of all Healthcare and Social Assistance jobs.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>2006 Jobs, City and County Combined</th>
<th>Number of Jobs Projected in 2016</th>
<th>Total Openings in 2016</th>
<th>Increase in Demand</th>
<th>Educational Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered Nurses</td>
<td>18003</td>
<td>22552</td>
<td>7523</td>
<td>41.8%</td>
<td>Associates Degree</td>
</tr>
<tr>
<td>Physicians and Surgeons, all other</td>
<td>2632</td>
<td>2953</td>
<td>798</td>
<td>30.3%</td>
<td>Doctorate</td>
</tr>
<tr>
<td>Physical Therapists</td>
<td>1412</td>
<td>1691</td>
<td>446</td>
<td>31.6%</td>
<td>Master's Degree</td>
</tr>
<tr>
<td>Medical and clinical laboratory technologists</td>
<td>1428</td>
<td>1613</td>
<td>400</td>
<td>28.0%</td>
<td>Bachelor's Degree</td>
</tr>
<tr>
<td>Radiologic Technologists and Technicians</td>
<td>1265</td>
<td>1459</td>
<td>360</td>
<td>28.5%</td>
<td>Associates Degree</td>
</tr>
<tr>
<td>Medical and Public Health Social Workers</td>
<td>986</td>
<td>1120</td>
<td>339</td>
<td>34.4%</td>
<td>Bachelor's Degree</td>
</tr>
<tr>
<td>Respiratory Therapists</td>
<td>703</td>
<td>905</td>
<td>306</td>
<td>43.6%</td>
<td>Associates Degree</td>
</tr>
<tr>
<td>Dental Hygienists</td>
<td>756</td>
<td>903</td>
<td>288</td>
<td>38.1%</td>
<td>Associates Degree</td>
</tr>
<tr>
<td>Occupational Therapists</td>
<td>637</td>
<td>779</td>
<td>237</td>
<td>37.1%</td>
<td>Master's Degree</td>
</tr>
<tr>
<td>Medical and clinical laboratory technicians</td>
<td>813</td>
<td>923</td>
<td>233</td>
<td>28.6%</td>
<td>Associates Degree</td>
</tr>
</tbody>
</table>

Data Sources: Baltimore City WIA and Baltimore County WIA Occupational Projections 2006-2016 - Total openings include openings created through turnover.

The Demand Side—Jobs and Educational Requirements

Number of Projected Job Openings in Core Healthcare and Social Assistance-Related Occupations in 2016

15,485

Educational Attainment Requirements for Core Healthcare and Social Assistance Occupations

The Top Ten list in the table above takes into account all of the jobs with a numerical presence in the industry sector. In contrast, the pie-chart to the left includes a subset of that broad universe of occupations considered to be “core”, or focused on industry specific expertise.

To identify gaps between the supply of graduates prepared to fill industry “core” occupations and the demand for jobs requiring similar levels of educational preparation, compare the pie chart to the left with the Supply Side pie chart on the opposing page.


The Department of Labor, Licensing and Regulation Division of Labor and Industry- Apprenticeship and Training. Available online at: http://dllr.maryland.gov/labor/APP.html
Recommendations

Based on the findings, the Committee makes the following recommendations:

◊ Study results indicate that a large gap exists between the current number of graduates from Associates Degree-level programs and the demand for workers with this level of education. Representatives from the Healthcare and Social Assistance business community, members of regional workforce agencies, and post-secondary institutions should partner to examine Study results in greater depth, to determine which post-secondary programs need to be created or expanded to meet occupational demand.

◊ A systemic evaluation of enrollment rates in regional post-secondary programs should be conducted. This evaluation should focus specifically on those programs that prepare workers in occupations for which the current and/or projected demand is outstripping the supply of graduates. The administrations of regional post-secondary institutions should partner to develop a shared mechanism that directs students to programs with open seats.

◊ Partnerships should be formed between education and the public and private sectors to create more internship programs, work-study programs, and hands-on learning experience for both high school age and college age students, to accelerate their ability to gain work experience and to apply it in a meaningful environment.

◊ Post-secondary institutions should implement a variety of strategies for producing greater numbers of graduates for high-demand occupations, including the following options: 1) Programs should be redesigned to offer an accelerated graduation option, in which the length of time it takes to complete the program is shortened; 2) Online, hybrid and other alternative delivery models should be incorporated into programs where possible, to promote the increased enrollment of “non-traditional” students. 3) industry partners should work with post-secondary institutions on initiatives that support student success.

◊ Healthcare and Social Assistance professionals should work with regional post-secondary institutions on a regularly scheduled basis, (perhaps annually or bi-annually) to review and update curriculum to meet industry standards, and to stay connected to changes in workforce trends.
How to Use This Tool

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Industry Sector: Hospitality and Tourism

Prepared by:
The Baltimore Workforce Investment Board’s Committee on Training and Post-Secondary Education
Hospitality and Tourism

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</tr>
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Supply Side Data
Inventory of post-secondary educational programs focused on preparing workers for Hospitality and Tourism-related occupations

Demand Side Data
Current and projected labor market projections and related educational requirements for high demand occupations in Hospitality and Tourism
The BWIB has adopted a system used by federal agencies to sort business establishments into industry sectors, based on commonalities in the goods they produce, services they deliver, or activities they perform. Occupational demand within industry sectors is calculated using national estimates for the number of people employed within industries in each occupational category. BWIB has associated specific occupational categories to industry sectors based on the degree to which these occupations support the core business activities in the sector. The graphic below illustrates the relationship between the BWIB’s definition for the industry sector and the associated core occupational categories.

BWIB’s Definition for the Hospitality and Tourism Industry Sector

- Retail Trade; Food and Beverage; Clothing and Clothing Accessories Stores; Sporting Goods, Hobby, Book, and Music Stores; General Merchandise Stores; Miscellaneous Store Retailers: Scenic and Sightseeing Transportation; Convention and Visitors Bureaus; Convention and Trade Show Organizers; Performing Arts, Spectator Sports, and Related Industries; Accommodation Industries; and Food Services and Drinking Places (Including full-service restaurants; limited-service eating places; special food services, such as food service contractors, caterers, and mobile food services; and drinking places).

Core Occupational Categories within the Hospitality and Tourism Industry Sector

- Management
- Business and Financial Operations
- Sales

The Supply Side—Regional Post-Secondary Programming

Student Enrollments

The Maryland Higher Education Commission collects data annually to track statewide student enrollment in post-secondary programs. Based on the most recently published report for 2008, 1,090 students were enrolled in programs designed to prepare workers for a range of Hospitality and Tourism-related careers.

Current Regional Availability of Hospitality and Tourism-related Programs

- Lower Division Certificate Programs: 13
- A.A.S. / A.A.' Program: 4
- B.A./B.S. Programs: 3
- Masters Programs: 1

Number of 2008 Graduates in Hospitality and Tourism-Related Programs

Data Sources: Maryland Higher Education Commission—2008 Reports on Annual Trends in Enrollment by Program and Trends in Degrees and Certificates by Program—Available online at: http://www.mhec.state.md.us/Publications/research/index.asp
The Demand Side—Projected High-Demand Occupations

The table below notes the top ten jobs in the Hospitality and Tourism industry sector, by the projected increase in the total number of openings in 2016 (including turnover effect). The occupations below were derived from the entire universe of all Hospitality and Tourism jobs.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>2006 Jobs, City and County Combined</th>
<th>Number of Jobs Projected in 2016</th>
<th>Total Openings in 2016</th>
<th>Percent Increase</th>
<th>Educational Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>General and operations managers</td>
<td>867</td>
<td>833</td>
<td>224</td>
<td>25.8%</td>
<td>Bachelor’s Degree and Experience</td>
</tr>
<tr>
<td>Musicians and singers</td>
<td>438</td>
<td>404</td>
<td>94</td>
<td>21.5%</td>
<td>Long-Term On-the-Job Training</td>
</tr>
<tr>
<td>Coaches and scouts</td>
<td>222</td>
<td>252</td>
<td>87</td>
<td>39.1%</td>
<td>Long-Term On-the-Job Training</td>
</tr>
<tr>
<td>Sales representatives, services, all other</td>
<td>155</td>
<td>191</td>
<td>72</td>
<td>46.4%</td>
<td>Work Experience in a Related Field</td>
</tr>
<tr>
<td>Accountants and auditors</td>
<td>164</td>
<td>185</td>
<td>50</td>
<td>30.3%</td>
<td>Bachelor’s Degree</td>
</tr>
<tr>
<td>Massage therapists</td>
<td>190</td>
<td>216</td>
<td>46</td>
<td>24.2%</td>
<td>Vocational Post-secondary Award</td>
</tr>
<tr>
<td>Meeting and convention planners</td>
<td>90</td>
<td>94</td>
<td>33</td>
<td>37.2%</td>
<td>Bachelor’s Degree</td>
</tr>
<tr>
<td>Managers, all other</td>
<td>111</td>
<td>116</td>
<td>29</td>
<td>26.4%</td>
<td>Work Experience in a Related Field</td>
</tr>
<tr>
<td>Self-enrichment education teachers</td>
<td>100</td>
<td>116</td>
<td>26</td>
<td>25.9%</td>
<td>Work Experience in a Related Field</td>
</tr>
<tr>
<td>Business operations specialists, all other</td>
<td>89</td>
<td>102</td>
<td>23</td>
<td>25.3%</td>
<td>Bachelor’s Degree</td>
</tr>
</tbody>
</table>

Data Sources: Baltimore City WIA and Baltimore County WIA Occupational Projections 2006-2016 - Total openings include openings created through turnover.

The Demand Side—Jobs and Educational Requirements

551

Number of Jobs Projected In Core Hospitality and Tourism-Related Occupations in 2016

Educational Attainment Requirements for Core Hospitality and Tourism Occupations

The Top Ten list in the table above takes into account all of the jobs with a numerical presence in the industry sector. In contrast, the pie-chart to the left includes a subset of that broad universe of occupations considered to be "core", or focused on industry specific expertise.

To identify gaps between the supply of graduates prepared to fill industry "core" occupations and the demand for jobs requiring similar levels of educational preparation, compare the pie chart to the left with the Supply Side pie chart on the opposing page.

Recommendations

Based on the findings, the Committee makes the following recommendations:

◊ A more detailed comparative analysis of specific educational programs and in-demand occupations should be conducted to assess the degree to which program availability is satisfying business needs.

◊ Based on the gap between supply and demand that was identified in this study, the number of post-secondary institutions that currently offer a B.S./B.A. degree program in Hospitality and Tourism should be modestly increased to meet projected need.

◊ Post-secondary educational institutions that offer lower division certificate programs, A.A.S./A.A. programs, B.A./B.S. programs, and Master’s Programs should utilize the data collected for this study as the basis for discussions with business stakeholders in the Hospitality and Tourism industry, in order to determine, among other things, what jobs their students are interested in filling upon graduation.

◊ Partnerships should be formed between education and the public and the private sectors to create more internship programs, work-study programs and hands on learning experience for both high school age and college age students, to accelerate their ability to gain work experience and to apply it in a meaningful environment.

◊ More specifically we would like to see the post-secondary schools make it mandatory for students to complete a six month internship in which they receive school credits that count toward their required graduation requirements. This would help better prepare the students to be successful leaders in our industry.
How to Use This Tool

While the Talent Development Pipeline Study was designed to serve a wide range of audiences, four major audiences are shown in the graphic below, with suggestions for how the Study can be used to facilitate research and inform strategic planning.

<table>
<thead>
<tr>
<th>Who?</th>
<th>What?</th>
<th>How?</th>
</tr>
</thead>
</table>
| High School and Post-Secondary Guidance Counselors, Parents and Students | Academic and Career Planning | • Explore regional educational and career options.  
• Identify occupations that are expected to grow in demand in the Baltimore region.  
• Locate post-secondary educational programs in the Baltimore region linked to career preparation.  
• Compare the enrollment and graduation rates of programs within a training discipline at all of the regional post-secondary institutions. |
| Educational Institutions | Educational Program Development | • Assess the alignment of current curriculum with workforce trends.  
• Expand or modify educational programming to prepare workers for projected workforce needs.  
• Guide strategic resource development efforts. |
| Workforce Professionals and Job Seekers | Career Exploration and Job Training | • Identify occupations that are projected to grow in demand in the Baltimore region.  
• Explore a range of regionally available training options for career preparation.  
• Evaluate opportunities for short, medium, and long-term training programs in high-demand careers. |
| Businesses | Recruitment of Qualified Workers | • Identify post-secondary institutions producing qualified workers.  
• Alert employers to current or projected gaps between the supply of qualified graduates and occupational demand.  
• Partner with post-secondary institutions to address improve the alignment between programming and industry needs. |

Note: Audiences who might benefit from using the research provided in this study are not limited to those shown in the above graphic. Further, the Study can be used in many creative ways not included among the ideas suggested.
Conclusions

The Talent Development Pipeline Study is the result of an intensive, two-year investigation, originally prompted by one simple question: “Are post-secondary institutions here in the Baltimore region preparing students for the kinds of jobs local business are trying to fill?” The representatives from business, education, and government who serve on the BWIB’s Training and Post-Secondary Education Committee were naturally drawn to the question, which reflects shared concern as to whether local post-secondary institutions are producing graduates with occupational skill sets, certifications, and degrees aligned to the industry make-up of the local economy.

The Committee elected to take a regional approach in the design of the Study from the inception of the project, in recognition of the fact that the artificial geographic boundaries separating Baltimore City from Baltimore County are rarely the deciding factor in filling a job, either for graduates seeking employment in their field or for employers seeking qualified applicants. In adopting a regional perspective, the Committee took the view that promoting the necessary conditions to prepare a competitive workforce with 21st Century skills is key to positioning the entire Baltimore area for a healthy, thriving economy in the years to come.

It was not the Committee’s goal, in publishing the Study, to produce definitive answers with respect to the question of alignment between educational capacity and labor market demand. Each industry sector is comprised of a complex collection of variables requiring a much deeper examination than was possible in a work of this scope. Rather, it is the Committee’s intent that the Study illustrate general trends, and launch a wider discussion among regional stakeholders.

The Study will serve as an excellent source for informing and influencing regional workforce development efforts. The recently formed Baltimore Regional Initiatives Taskforce will play an important role in utilizing the Study to identify opportunities for partnership, and generate greater focus on preparing a pipeline of credentialed, qualified professionals. City and County post-secondary educational institutions can refer to the study as a resource for strategic planning based on a clearly documented landscape of regional program offerings. Similarly, secondary school guidance counselors and parents from both the City and County jurisdictions can use the Study to gain valuable insight into projected growth in occupational demand across a wide range of professions, along with an inventory of the full breadth of related available local post-secondary programming. Other regions, unified in the consensus that a strong, well-qualified workforce is an asset worth promoting, may choose to leverage the Study as a model for their own efforts.

And while the subject matter addressed in the Talent Development Pipeline Study zeroes in on education/industry alignment issues at a regional level, this work is also part of a much larger dialogue. Recent state and national initiatives are placing similar focus on optimizing the alignment between occupational preparation and industry demand. The most prominent of such activities is Skills2Compete (S2C), a non-partisan campaign sponsored by the National Skills Coalition. S2C seeks to promote the notion that members of the American workforce must possess the skills necessary to simultaneously meet business demand, foster innovation, and move toward shared prosperity.
Conclusions

In March 2010, Maryland joined ten other states with initiatives aligned with National Skills Coalition’s national Skills2Compete campaign. At the direction of Governor Martin O’Malley, Maryland has crafted its own similar effort, unique to the State’s workforce needs¹. The goals of Maryland’s S2C campaign are as follows:

◊ Increase Maryland’s skilled workforce by 20% by 2012;

◊ Increase Maryland’s economic competitiveness;

◊ Increase the number of Maryland’s who attain education and training beyond high school;

◊ Produce more skilled workers to meet the growth of middle/high skill jobs;

◊ Grow the middle class by providing opportunities for more Marylanders to gain skills, increase earnings and advance in the workplace;

◊ Support President Barack Obama’s goal of increased community college graduation rates and increased post-secondary participation to improve the nation’s competitiveness.

The focus that this Study has placed on the supply and demand side of the education and training continuum will surely facilitate the State of Maryland’s collective efforts to meet or exceed the S2C goals outlined above.

General Recommendations

The Committee conducted an individual review of each industry sector report in order to generate recommendations. It became evident during the review that certain recommendations were universally applicable across all industry sectors. Therefore, while specialized recommendations are included for each sector, those deemed by the Committee to have universal value are also noted here.

Based on the findings, the Committee makes the following recommendations:

◊ The Talent Development Pipeline Study offers a high-level snapshot of each industry sector. However, a more detailed comparative analysis of specific educational programs and in-demand occupations should be conducted to assess the degree to which program availability is satisfying business needs within each industry sector.

◊ Partnerships should be formed between education and the public and private sectors to create more internship programs, work-study programs, and hands-on learning experience for both high school age and college age students, to accelerate their ability to gain work experience and to apply it in a meaningful environment.

◊ Stronger coordination is needed among high schools, community colleges and Bachelors pro-

¹ For additional information regarding Maryland Skills2Compete, please refer to the following webpage: http://www.skills.maryland.gov/qanda.html
Conclusions

grams to assure seamless, integrated and non-redundant preparation for continuous career adv-
ancement.

◊ Post secondary institutions should add value to their educational programs by providing students
with opportunities to gain industry-standard technical certifications and licenses as a part of their
degree programs. This could be accomplished through closer partnerships between research
institutions and the private sector, to make sure that the degree programs are staying current with
the demands of the industry.

◊ Up-skilling incumbent workers to ensure that they maintain their competitive edge in the market-
place should be an important focus of the continuing education departments of regional commu-
nity colleges.

◊ Regional secondary and post-secondary institutions should coordinate efforts to promote educa-
tional opportunities in science, technology, education and math, (referred to collectively as the
"STEM disciplines"). STEM-related skill sets, certifications, and degrees are central to
many emerging occupational trends, especially those related to the jobs coming to the Baltimore
region as a result of the Base Realignment and Closure Act of 2005.