Maryland Higher Education Commission

Office of Student Financial Assistance

Report

Of the

Advisory Council on Workforce Shortage

January 2008

Advisory Council on Workforce Shortage

<u>Members</u>

Mr. P. Michael Carey
Community College of Baltimore County

The Honorable Paul Pinsky
Senator

Ms. Antoinette W. Coward
Department of Health and Mental Hygiene

Dr. Joseph Popovich
Morgan State University

Ms. Laura Donnelly
Johns Hopkins University

Ms. Jackie Potter
Chesapeake College

Mr. Peter Eide
Maryland Chamber of Commerce

Mr. Tim Priest
Greater Washington Board of Trade

Ms. Nancy Hall
MD Association of Nonprofit Organizations

Mr. Bret Schreiber
MD Independent Colleges and
Universities Association

Mr. Donald P. Hutchinson
Greater Baltimore Committee

Mr. Eric Seleznow
Governor's Workforce Investment
Board

The Honorable Anne Kaiser
Delegate

Ms. Brenda Townsend-Milton
Department of Business and
Economic Development

Ms. Barbara Klein
University of Maryland, Baltimore

Ms. Jan Moylan Wagner
Central Scholarship Bureau

Dr. James E. Lyons, Sr.
MD Higher Education Commission

Dr. John T. Wolfe
University System of Maryland

Ms. Kathy Oliver
MD State Department of Education

Mr. Tim Wolfe
St. Mary's College of Maryland

Dr. Thomas E. Perez
Department of Labor, Licensing and Regulation

Maryland Higher Education Commission
Andrea Mansfield
Elizabeth Urbanski
Maura Sappington
Dean Kendall

Advisory Council on Workforce Shortage

Table of Contents

Executive Summary

Legislation that passed during the 2006 General Assembly session, Higher Education – Workforce Shortage Student Assistance Grants (Chapter 367, Acts of 2006), consolidates seven workforce related State financial assistance programs into one program and provides a framework for developing a model to identify critical workforce occupations to be a part of the program to meet Maryland's workforce needs. As specified in the legislation, a 21-member Advisory Council on Workforce Shortage was appointed to assist with the development of the model and implementation of the program.

The Advisory Council began its work by discussing program guidelines, awarding criteria, and service obligations to implement the program for the 2007-2008 academic year. In the first year of implementation, awards in the Grant program were made in workforce areas related to the seven programs which were consolidated. The majority of the Council's work over the course of the past year focused on the development of the workforce model and program enhancements for the 2008-2009 academic year. The Advisory Council also explored private sector donations to increase funding for the program.

To develop the workforce model to be used to identify occupational areas to be incorporated into the Grant program, the Advisory Council reviewed occupational projections from the Department of Labor, Licensing and Regulation, graduation data from the Maryland Higher Education Commission, comments from public hearings examining public good and benefit occupations, and studies from other State Agencies to identify workforce fields in short supply to be served by the Grant program. Based on this information, the Advisory Council is making recommendations regarding the workforce model and the occupations to be included in the Grant program. The Advisory Council is also making recommendations for the management and allocation of funds, the manner in which occupations should be added, service obligation enhancements and requirements, and private sector donations.

Recommendations

Workforce Model

The Advisory Council endorses the model used to identify priority workforce occupations and recommends further use of the model. The Council further recommends that other analytical tools be incorporated into the model for future use as they become available.

Other financial aid uses for the workforce model

The Janet L. Hoffman Loan Assistance Repayment (LARP) program provides assistance to students who work in public service in State or local government or the nonprofit sector in Maryland providing services to low income or underserved residents with paying off student loans. Eligible occupations are similar to those in the Workforce Shortage Student Assistance Grant (WSSAG) program. Since LARP has a similar focus, the Advisory Council is making the following recommendations with respect to the program:

- The workforce model should be used to assist with making informed decisions regarding the inclusion of specific occupations in the Janet L. Hoffman Loan Assistant Repayment Program (LARP).

- MHEC should explore expanding LARP to include economic development occupations. Depending on the occupation, degree requirements and wages, some occupations may be better served through LARP than WSSAG.

- MHEC should develop criteria to assist in determining whether an occupation is better served through LARP or a scholarship.

- Considering the required degree and experience to be employed in the following occupations, which were identified through the workforce model, Education Administrators, Pharmacists, Educational and Vocational School Counselors, Speech Pathologists, Audiologists, and Sign Language Interpreters, the Advisory Council recommends that MHEC explore the inclusion of these occupations in LARP.

Program Enhancements

Overarching Recommendation

The Advisory Council strongly recommends that a balanced approach be used to address workforce shortages in both public good and economic development occupations. It also recommends that as occupations are added to the program, they be balanced amongst the types, public good and economic development.

Management and Allocation of Funds

To ensure funds are managed and allocated for occupations efficiently and effectively, the Advisory Council recommends the following.

- The current funding level should be maintained for existing occupations and new occupations should only be added if additional funds are provided in the program.

- Considering the number of existing occupations that have had waiting lists over the past couple of years, MHEC should set a goal to incrementally increase funding for awards in these occupational areas until all eligible applicants are awarded.

- To ensure a balanced approach, funds should be added to the program to keep pace with demand in all occupations, those currently in the program as well as public good and economic development occupations that may be added.

- When allocating funds to specific occupations for making awards, the following components should be taken into consideration: 1) the gap analysis; 2) the number of applications received; 3) the number of awards made in each eligible occupation; and 4) the number of students placed on a waiting list.

Addition of New Occupations

- Efforts should first be focused on both public benefit and economic development occupations demonstrating gaps in annual openings and annual graduates. Once these occupations have been incorporated into the program, occupations with small gaps or identified as emerging fields should be added.
- Occupations demonstrating gaps should be added in the following order:
    a. Medical and Clinical Laboratory Technicians and Technologists
    b. Dental Hygienists
    c. Computer and Electrical Engineers
    d. Computer/Network Managers
    e. Civil Engineers
    f. Microbiologists
    g. Aerospace Engineers
    h. Architects
- Occupations with small gaps or identified as emerging fields should be added in the following order:
    a. Medical Records and Health Information Technicians
    b. Respiratory Therapists and Technicians
    c. Radiologic Technologists and Technicians
    d. Chemical Engineers
    e. Biomedical Engineers
    f. Mechanical Engineers
    g. Computer and Information Systems

- As additional healthcare occupations are added to the program, the service obligation component associated with each occupation should include employment as a healthcare faculty member.

Service Obligation Enhancements for Existing Occupations

- Individuals receiving an award through this program must agree to work one year in an eligible occupation in the State of Maryland for each year the award was received. If a student receives a degree in a major that falls into more than one specified service area, the student can fulfill the service obligation in either area.

- Expanding the eligible employment fields for those majoring in human services degree programs to include employment by the State or any local government in Maryland.

- Expanding the approved teacher education programs to include all programs leading to certification in any teaching field as long as the individual commits to working in a Title I school or a school designated for improvement.

<u>*Service Obligation Requirements for New Occupations*</u>

Medical and Clinical Laboratory Technicians and Technologists, Medical Records and Health Information Technicians, Respiratory Therapists and Technicians, Radiologic Technologists and Technicians.

- Recipients must be employed in one of these fields in a licensed hospital, public health agency, home health agency, a nonprofit organization under 501(c)(3) or (4) of the Internal Revenue Code of 1986, or other organization authorized by the Secretary of Health and Mental Hygiene. Recipients may also be employed as faculty members in one of these areas.

Dental Hygienists

- Recipients must be employed in any federal, State, local, or private for-profit or nonprofit dental facility (including a solo, group, or incorporated private practice) that treats all persons and agrees that a minimum of 30% of its practice patient population will be MMAP recipients. This includes institutions of higher education with dental schools that provide dental services to disadvantaged populations.

Computer/Network Managers, Computer and Electrical Engineers, Civil Engineers, Microbiologists, Biomedical Engineers, Computer and Information Systems, Chemical Engineers, Mechanical Engineers, Aerospace Engineers, Architects

- Recipients must be employed in the State in an occupation directly related to the eligible program of study.

<u>*Private Sector Scholarship Donations*</u>

The Advisory Council recommends that this issue be revisited when the Council begins to consider eligible occupations for the 2010 – 2011 academic year.

Background

Legislation that passed during the 2006 General Assembly session, Higher Education – Workforce Shortage Student Assistance Grants (Chapter 367, Acts of 2006) consolidates workforce related State financial assistance programs into one program and provides a framework for developing a model to identify critical workforce occupations to be a part of the program to meet Maryland's workforce needs. As specified in the legislation, an Advisory Council on Workforce Shortage was appointed to assist with the development of the model and implementation of the program.

The Advisory Council is comprised of 21 members representing higher education, state agencies, business, non-profit organizations and the General Assembly. The role of the Advisory Council is to identify workforce shortage fields in the State and recommend to the Maryland Higher Education Commission (MHEC) priority workforce shortage fields to be included in the Workforce Shortage Student Assistance Grant program and those to be removed because they no longer qualify as a workforce shortage field. When establishing the list of priority workforce shortage fields, the Advisory Council shall take into consideration whether the occupation provides a public good or benefit to the citizens of Maryland. In addition, the Advisory Council will assist with the development of program guidelines and the determination of the number of grants to be awarded in each eligible workforce shortage field.

This legislation and the consolidation of State financial assistance programs is the culmination of efforts to make career-based financial assistance less confusing for students and parents and to ensure that the programs are meeting the workforce needs of the State. The Student Financial Assistance Reform Act of 2005 (Chapter 429, Acts of 2005) required the Maryland Higher Education Commission (MHEC) to establish a workgroup to study the consolidation of economic development student assistance grants and work-based shortage grants into a single financial assistance program. The language in the bill stated that the grant program should, to the extent practicable, establish uniform criteria for grant eligibility, award amounts, and service obligation requirements and that the new program should include a methodology for prioritizing work-based shortage grants. A report with findings and recommendations was to be provided to the Governor and General Assembly prior to the 2006 General Assembly session. It is this report that resulted in the legislation to create the Workforce Shortage Student Assistant Grant Program and the Advisory Council.

This legislation consolidated the following seven programs into the Workforce Shortage Student Assistance Grant Program:

- Child Care Provider Scholarship;
- Developmental Disabilities, Mental Health, Child Welfare, and Juvenile Justice Workforce Tuition Assistance Program;
- Distinguished Scholar Teacher Education;
- Sharon Christa McAuliffe Memorial Teacher Scholarship;
- State Nursing Scholarship and Living Expenses Grant;
- Physical and Occupational Therapists and Assistants Scholarship; and,
- William Donald Schaefer Scholarship.

The legislation also established the responsibilities of the Advisory Council and the basic eligibility and awarding criteria for the program.

Advisory Council Activities

The Advisory Council was appointed in August 2006 and is comprised of 21 members representing the following organizations:

- Maryland Higher Education Commission
- Department of Labor, Licensing, and Regulation
- Governor's Workforce Investment Board
- Department of Business and Economic Development
- Department of Health and Mental Hygiene
- Maryland State Department of Education
- Senate of Maryland
- Maryland House of Delegates
- University System of Maryland
- Morgan State University
- St. Mary's College of Maryland
- Maryland Independent College and University Association
- Maryland Association of Community Colleges
- Maryland Chamber of Commerce
- Washington Board of Trade
- Greater Baltimore Committee
- Maryland Association of Nonprofit Associations
- Financial Assistance Advisory Council of the Maryland Higher Education Commission

A series of 7 meetings were held by the Advisory Council beginning in August 2006. At the first meeting a charge, Advisory Council work plan and timeline, and an administrative timeline were discussed and approved by the group. These documents can be found in Appendix A, B, and C. The Advisory Council also discussed changes to program guidelines to implement the Workforce Shortage Student Assistance Grant Program, which consolidates seven existing State workforce scholarships, and discussed components of the proposed workforce model.

Having a timeline specified for the Advisory Council's work and one for the administrative work of the agency was critical. While the Advisory Council was developing the workforce model to identify critical workforce occupations to be incorporated into the new program, MHEC's Office of Student Financial Assistance needed to implement the grant for the 7 programs being consolidated and ensure any changes proposed by the Advisory Council could be incorporated into the Commission meeting schedule. These timelines kept us on track for the first implementation year and will ensure that guidelines and procedures are in place for the second year of implementation.

For the first year of the program, academic year 2007-2008, only the occupations that fell under the existing seven programs were included. The intent is to add more occupations for the 2008-2009 academic year should additional funds be available and once the Advisory Council creates the workforce model and is able to analyze data to make informed decisions about the occupations to be included.

Guideline discussions focused on creating uniform eligibility and award criteria, establishing award amounts, fund allocation across eligible program areas, and service obligation requirements. Trend data was requested for all seven programs in the following areas: 1) funding; 2) awards made; 3) Grade Point Average (GPA) reached; and 4) service obligation completions and repayments.

Discussions on the workforce model centered around four basic components: 1) DLLR data to identify demand occupations both statewide and regional; 2) Graduation data to be used as a component of supply to be matched with demand data; 3) Data to be collected and analyzed to determine whether occupations provide a public good or benefit to Maryland citizens; and 4) Other analytical tools to be incorporated into the model for future use. The workforce model will be discussed in more detail in the recommendation section of this report.

Considering the complexity of the data and the task at hand, it was decided that a smaller working group would be established to review data and program issues prior to being presented to the Advisory Council. This working group was comprised of a few Advisory Council members, data experts from the agencies represented on the Council, and a staff member from the Department of Legislative Services who assisted with drafting the legislation to create the program. This group met four times and proved to be invaluable as we worked through data issues and developed recommendations for the Advisory Council to consider.

At the second meeting, the Advisory Council reviewed the requested data to determine minimum and maximum awards, service obligation criteria, and the GPA ranges to be used when making awards; discussed and approved the guidelines to be used for making awards in academic year 2007-2008; discussed how to solicit public comment and data to evaluate public good and benefit occupations; and reviewed occupational models. It was decided that the award amounts would be set at the amount specified in statute. As additional funds are placed in the program the awards amounts will be revisited. To be considered for an award, students are ranked by need and merit. It was determined that students will be ranked by need within the following GPA ranges:

GPA 3.8 to GPA 4.0	GPA 3.0 to GPA 3.39
GPA 3.6 to GPA 3.79	GPA 2.9 and below
GPA 3.4 to GPA 3.59	

To solicit comment and data to evaluate public good and benefit occupations it was decided that a public hearing should be held. Information gathered at the public hearing will be used by the Advisory Council to assist in determining whether the occupations should be a part of the Grant program.

The Governor's Workforce Investment Board provided an overview of the Industry Sector Model and DLLR discussed its occupational projections, how the data is collected, shortcomings, and other data available to assist with determining critical shortage fields.

The third Advisory Council meeting was the public hearing. The hearing was held on December 15, 2006 at Anne Arundel Community College. Twenty-four organizations representing mental health, rehabilitation, and substance abuse counselors; nurses and geriatric nurses; teachers; speech pathologists and audiologists; public interest law; social workers; occupational therapists; and sign language interpreters were represented. Each organization was asked to respond to the following questions to help the Advisory Council assess the critical need for these occupations:

1) An overview of the occupation(s), how or why it provides a public good or benefit, and the population served.

2) Number of individuals currently employed in occupation, if known.

3) Educational level required and pay scale.

4) Copies of surveys or studies that may have been performed documenting workforce needs of the occupation, including an explanation of why the study was performed and how the data was collected.

5) Data quantifying need for additional individuals to assist populations served (case load requirements, hiring trends, turnover rates), including an explanation of why the study was performed and how the data was collected.

6) Information to explain why need for financial assistance exists and that providing scholarships will make a difference (for example: working conditions result in individuals not going into the occupation).

7) If it is determined that scholarships will make a difference, the award amount that will have the most impact.

8) Any other information relevant to assessing the public good or benefit of the occupation.

This information was condensed into a chart to assist the working group with its review as it developed recommendations for the Advisory Council. (Appendix D).

The fourth Advisory Council meeting took place in April following two meetings of the smaller working group. The smaller group needed time to review occupational and graduation data, public hearing information, and other data collected to present findings to the Council. A number of tweaks to the program were also being discussed during the 2007 General Assembly Session.

Legislation changed the name of the service area of the program for students who plan to work in the fields of developmental disabilities, mental health, child welfare, and juvenile justice to the Ida G. and L. Leonard Ruben Scholarship. Other changes altered the eligibility requirements to allow students in mandatory summer academic sessions to be

eligible for additional funding, and to require students to earn a certain number of credit hours in an academic year to meet full-time or part-time status. It was also decided that the application deadline would be moved to July 1 to ensure students will be able to submit transcripts to be considered for the program.

During the fourth meeting, the Advisory Council fully discussed the components of the workforce model, how the occupations examined were narrowed, the gap analysis that resulted, and whether occupations were currently eligible under an existing scholarship program. Key documents that assisted with this discussion are included in Appendices E, F, and G.

The Advisory Council also discussed the solicitation of business donations to add funding to the program for economic development occupations. This discussion continued at the fifth meeting. A number of questions were suggested to posed to businesses to determine interest. GWIB offered to survey businesses through its Industry Clusters model to determine interest. The ability of a business to deduct donations was also reviewed. It was determined that a donation is tax deductible, but limitations may exist and a tax advisor should be consulted.

Also at the fifth meeting, the Council discussed the expansion of service obligation employment areas for certain occupations and began its discussion of economic development and public benefit occupations not currently in the grant program that should be considered as the programs expands. Documents can be found in Appendices H, I, and J. These discussions continued into the sixth meeting and were finalized. Service obligation recommendations are included in this report and the gap analysis data used to recommend new occupations for inclusion in the program are further explained in the Workforce Model section of this report.

At the seventh meeting of the Advisory Council, the group discussed how funds should be allocated across occupations, approved service obligation employment areas for the new occupations, finalized recommendations and discussed its final report.

Workforce Model

The Advisory Council on Workforce Shortage has been charged with identifying workforce fields in the State of Maryland and recommending to the Maryland Higher Education Commission (MHEC) the priority workforce shortage fields to be included in the Workforce Shortage Student Assistance Grant program and those that should be removed. To identify and recommend these fields, the Advisory Council will use occupational projections from the Department of Labor, Licensing and Regulation, graduation data from the Maryland Higher Education Commission, comments from public hearings examining public good and benefit occupations, and studies from other State agencies identifying workforce fields in short supply. To assist with this process, a smaller workgroup was established from the larger Advisory Council to work in collaboration with the staff of MHEC to review data and discuss findings prior to sharing information with the Advisory Council for consideration.

To determine the total number of openings for occupations in Maryland, or occupational demand, MHEC consulted with the staff of the Maryland Department of Labor, Licensing, and

Regulation (DLLR). Using DLLR's Occupational Projection for 2004-2014, staff assessed a total of 253 occupations requiring an associate, bachelors, masters, doctorate or professional degree. Occupations were ranked by projected employment, growth openings, replacement openings, and the total openings expected by 2014. In addition, DLLR looked at the projected wage growth in these occupations from 2000 to 2005 and 2003 to 2005 to further refine the data. From this data, the projected average growth rate and wage rate was calculated. Thirty-eight (38) occupations with a higher than average growth rate and wage rate between 2000-2005 and between 2003-2005 were identified for further study. It should be noted that this data does have limitations. It is not collected for certain workforce populations and it is difficult to capture all circumstances that affect employment. The use of other studies and documentation addresses these limitations to some degree.

A public hearing was held on December 15, 2006 to solicit comments and to determine public good or benefit demand occupations that may be a subset of certain occupations or not easily identifiable through DLLR occupational projections. MHEC staff went back through the list of 253 occupations identified using DLLR occupational data and added occupations that were represented at the public hearing or through supporting information from the business community, State entities and other organizations. These occupations include those in science and technology, health and teaching fields, and postsecondary education. Twenty-four (24) additional occupations were identified bringing the total number of occupations identified for further study to 62. MHEC reranked these occupations based on projected employment, growth openings and total openings.

Next, MHEC matched occupational data with graduation data to determine where there may be gaps in the number of annual openings and the number of annual graduates. Occupational titles are all identified by a standard occupational classification code (SOC code) and all academic programs are identified by a standard classification of instructional program code (CIP code). Using the National Crosswalk Service Center, staff was able to match the SOC code of the occupational title with the CIP code of the academic program. It should be noted that a number of individuals who graduate in a degree program each year may decide to continue their education, and not become employed. Therefore, graduation data may overstate supply. This issue should be examined more closely.

CIP code information for the 62 identified occupational titles was matched with MHEC graduation data for the past ten years to establish a graduation trend line for each program. Staff then analyzed the graduation data for 2006 and annual openings for one year. Since multiple programs can lead to employment in similar occupations, some occupations were collapsed to provide a more accurate picture of supply and demand. A listing of occupations collapsed is in the document titled "Discussion Packet Document Footnotes." A gap analysis was performed and numerous charts and graphs were constructed to easily identify which occupations have a shortage of graduates.

Many of the occupations identified are already eligible occupations under the Workforce Shortage Student Assistance Grant Program or the Janet L. Hoffman Loan Assistance Repayment Program. Therefore, occupations were grouped by those already covered under either of these programs and those that are not currently included in a State financial assistance

program. Occupations were then ranked by the gap in annual openings and annual graduates in descending order. MHEC staff then reviewed reports and studies from State and business entities to further document the shortage of workers in these identified fields. This information is intended to give the Advisory Council additional justification for the inclusion of these occupations in the grant program should it be desired. These studies include the Maryland State Department of Education (MSDE)'s annual Teacher Staffing Report, and the Maryland Department of Health and Mental Hygiene (DHMH)'s annual Health Occupations Shortage List.

Allocation Methodology

Occupations are recommended for inclusion in the scholarship program based on the Workforce Model. Once funds are provided for awards in an occupational area, funds need to be allocated appropriately to ensure awards are being made in those occupational areas of greatest demand. It should be noted that greatest demand may not be those occupations demonstrating the largest gap between annual openings and annual graduates. Demand for awarding scholarships is driven by the number of applications received, the number of awards made in each eligible occupation, and the number of students placed on a waiting list because funds are insufficient. The allocation methodology needs to be flexible enough to consider the Workforce Model gap analysis and each of these components as awards are being made.

Advisory Council Recommendations

Workforce Model

Overarching Recommendation

The Advisory Council endorses the model used to identify priority workforce occupations and recommends further use of the model. The Council acknowledges some of the shortcomings with the data, but when combined with other types of analysis, it is a very sound model. The Council further recommends that other analytical tools be incorporated into the model for future use. It is envisioned that as new tools become available the workforce model will be adapted to incorporate new techniques. For example, a model is being developed to determine demand occupations by region of the State. GWIB, through its Center for Industry Initiatives, is convening industry, education and government stakeholders to address workforce issues in the industries that are significant to the economy of Maryland. In addition, the Advisory Council recommends that options be explored to better define the graduation data to reflect graduates who are employable rather than returning to postsecondary education. This may involve surveying institutions with specific programs.

Other financial aid uses for the workforce model

In addition to the WSSAG program, MHEC administers the Janet L. Hoffman Loan Assistance Repayment program to assist students who work in public service in State or local government or

the nonprofit sector in Maryland providing services to low income or underserved residents with paying off student loans. Eligible occupations are similar to those in the WSSAG program. Since LARP has a similar focus, the Advisory Council is making the following recommendations with respect to the program:

- The workforce model should be used to assist with making informed decisions regarding the inclusion of specific occupations in the Janet L. Hoffman Loan Assistant Repayment Program (LARP).

- MHEC should explore expanding LARP to include economic development occupations. Depending on the occupation, degree requirements and wages, some occupations may be better served through LARP than WSSAG.

- MHEC should develop criteria to assist in determining whether an occupation is better served through LARP or a scholarship.

- Considering the required degree and experience to be employed in the following occupations, which were identified through the workforce model, Education Administrators, Pharmacists, Educational and Vocational School Counselors, Speech Pathologists, Audiologists, and Sign Language Interpreters, the Advisory Council recommends that MHEC explore the inclusion of these occupations in LARP.

Program Enhancements

Overarching Recommendation

The Advisory Council strongly recommends that a balanced approach be used to address workforce shortages in both public good and economic development occupations. The Council understands the importance of both types of occupations, however given the public benefit focus of occupations represented in the newly merged program, it wants to ensure the current number of students being served is maintained and not reduced. It also recommends that as occupations are added to the program, that they be balanced amongst the types, public good and economic development.

To ensure this approach, the Council is making specific recommendations regarding the management and allocation of funds, as well as an incremental way of adding new eligible occupations. In addition, the Advisory Council is making recommendations concerning service obligations and private scholarship donations.

Management and Allocation of Funds

To ensure funds are managed and allocated for occupations efficiently and effectively, the Advisory Council recommends the following.

- The current funding level should be maintained for existing occupations and new occupations should only be added if additional funds are provided in the program.

- Considering the number of existing occupations that have had waiting lists over the past couple of years, MHEC should set a goal to incrementally increase funding for awards in these occupational areas until all eligible applicants are awarded.

- To ensure a balanced approach, funds should be added to the program to keep pace with demand in all occupations, those currently in the program and public good and economic development occupations that may be added.

- When allocating funds to specific occupations for making awards, the following components should be taken into consideration: 1) the gap analysis; 2) the number of applications received; 3) the number of awards made in each eligible occupation; and 4) the number of students placed on a waiting list.

Addition of New Occupations

A number of new occupations, which have varying gaps between annual openings and annual graduates, have been identified for inclusion in the program. It may appear that for some occupations the number of necessary graduates is being produced, but these areas have been identified as emerging fields and therefore more graduates will be needed to meet an emerging demand. The Advisory Council recommends the following as occupations are being added:

- Efforts should first be focused on both public benefit and economic development occupations demonstrating gaps in annual openings and annual graduates. Once these occupations have been incorporated into the program, occupations with small gaps or identified as emerging fields should be added.

- Occupations demonstrating gaps should be added in the following order:
  a. Medical and Clinical Laboratory Technicians and Technologists
  b. Dental Hygienists
  c. Computer and Electrical Engineers
  d. Computer/Network Managers
  e. Civil Engineers
  f. Microbiologists
  g. Aerospace Engineers
  h. Architects

- Occupations with small gaps or identified as emerging fields should be added in the following order:
  a. Medical Records and Health Information Technicians
  b. Respiratory Therapists and Technicians
  c. Radiologic Technologists and Technicians
  d. Chemical Engineers
  e. Biomedical Engineers
  f. Mechanical Engineers

g. Computer and Information Systems

Another occupational area identified for inclusion in this program is healthcare faculty. The GWIB Healthcare Industry Initiative Steering Committee and other studies has shown that Maryland's higher education system does not have the teaching faculty capacity to accommodate the volume of applicants for enrollment into healthcare academic programs; particularly nursing. Other healthcare occupations such as occupational therapy, physical therapy and pharmacy also identify teaching faculty capacity as a workforce shortage need. With the current and projected healthcare workforce shortage, this critical issue is currently being addressed by the Military Health Care Personnel-staffing Initiative and the Statewide Commission on the Shortage in the Health Care Workforce both led by the Department of Health and Mental Hygiene (DHMH). Maryland's inadequate teaching capacity to prepare students for Maryland's healthcare occupations, due to inadequate teaching capacity, must be resolved. Nursing faculty are currently eligible for scholarship assistance, but other health faculty positions are not. Therefore, the Advisory Council recommends that:

- As additional healthcare occupations are added to the program, the service obligation component associated with each occupation should include employment as a healthcare faculty member.

Service Obligation Enhancements for Existing Occupations

Overarching Service Obligation Requirement: Individuals receiving an award through this program must agree to work one year in an eligible occupation in the State of Maryland for each year the award was received. If a student receives a degree in a major that falls into more than one specified service area, the student can fulfill the service obligation in either area.

Other enhancements include the following:

- Expanding the eligible employment fields for those majoring in human services degree programs to include employment by the State or any local government in Maryland. Previously, recipients could only work in community-based programs licensed or approved to operate by certain State entities. These State entities also hire staff who work as direct care workers or first-line supervisors to provide rehabilitation, rehabilitation, residential, or related community support services to individuals with developmental disabilities, mental health disorders, or who are dependent on alcohol or drugs; or who serve children in the custody of a local Department of Social Services or in any residential childcare program operated or licensed by the Department of Human Resources or the Department of Juvenile Justice. These agencies expressed difficulty in hiring and retaining staff in these agencies. Therefore, it seems logical to expand the eligible employment area to include working in these State agencies.

- Expand the approved teacher education programs to include all programs leading to certification in any teaching field as long as the individual commits to working in a Title I school or a school designated for improvement; or, individuals majoring in teaching

fields not determined to be a critical shortage field must work as a full-time teacher in a Title I school or school designated for improvement by the Maryland State Department of Education. Individuals receiving their certification in a designated critical shortage field are able to work in any Maryland public or private elementary or secondary school as a teacher in the State.

Service Obligation Requirements for New Occupations

Medical and Clinical Laboratory Technicians and Technologists, Medical Records and Health Information Technicians, Respiratory Therapists and Technicians, Radiologic Technologists and Technicians.

- Recipients must be employed in one of these fields in a licensed hospital, public health agency, home health agency, a nonprofit organization under 501(c)(3) or (4) of the Internal Revenue Code of 1986, or other organization authorized by the Secretary of Health and Mental Hygiene. Recipients may also be employed as faculty members in one of these areas.

Dental Hygienists

- Recipients must be employed in any federal, State, local, or private for-profit or nonprofit dental facility (including a solo, group, or incorporated private practice) that treats all persons and agrees that a minimum of 30% of its practice patient population will be MMAP recipients. This includes institutions of higher education with dental schools that provide dental services to disadvantaged populations.

Computer/Network Managers, Computer and Electrical Engineers, Civil Engineers, Microbiologists, Biomedical Engineers, Computer and Information Systems, Chemical Engineers, Mechanical Engineers, Aerospace Engineers, Architects

- Recipients must be employed in the State in an occupation directly related to the eligible program of study.

Private Sector Scholarship Donations

The statute authorizes MHEC to accept any gift or grant from any organization, business or private party to be used to provide scholarships in designated shortage occupations. To secure industry feedback about providing support for scholarships, GWIB surveyed business leaders involved in industry initiatives. Many businesses indicated an unwillingness to do so at this time for economic reasons. Some businesses indicated a willingness to donate if the State provided matching funds for this purpose. The Advisory Council therefore recommends that this issue be revisited when the Council begins to consider eligible occupations for the 2010 – 2011 academic year. The Advisory Council also suggests that GWIB, working with Maryland's industry leaders, continue to provide information on the industry's perspective of this issue.

Appendix A
Advisory Council on Workforce Shortage

<u>CHARGE</u>

The Advisory Council on Workforce Shortage is to identify workforce fields in the State and recommend to the Commission priority workforce shortage fields to be included in the grant program and those that should be removed.

At a minimum, the Advisory Council will make recommendations every two years in September to the Commission on the occupations to be included or removed from the grant program. The recommendations will include a list of priority demand occupations not to exceed a number recommended by the Advisory Council and specified in program guidelines. When establishing the priority list, the Advisory Council shall take into consideration whether the occupation provides a public good or benefit to the citizens of Maryland. The recommendations will also contain a plan for the inclusion or phasing out of certain occupations if they are found to be in greater or lesser demand. Recommendations will be submitted to the Commission for approval and will then be included in the program guidelines.

Once priority demand occupations are determined, the Advisory Council will assist with determining the allocation of funds across occupations and priorities for awarding if necessary. The Advisory Council will also assist with the development of program guidelines.

Appendix B

**Advisory Council on Workforce Shortage
Draft Work Plan and Timeline**

Aug 21 – 25   **First Advisory Council Meeting**

Organizational Items – discuss interim workgroup, legislation, charge and operational timelines

Discuss proposed guidelines to begin new program with existing occupational areas for academic year 2007-2008

Discuss components of proposed workforce model including: 1) DLLR data to identify demand occupations both statewide and regional; 2) Graduation data as components of supply; 3) Collection of data to determine whether occupations provide a public good or benefit to Maryland citizens; 4) Other analytical tools for future use

Sept. 25 – 29   **Second Advisory Council Meeting**

Finalize guidelines to be submitted to MHEC Finance Policy Committee in October*

Begin review of demand occupations

Discuss the establishment of gross demand thresholds

Discuss and decide how to solicit comment and collect data to evaluate occupations that provide a public good or benefit to Maryland citizens

Dec. 11 - 15   **Third Advisory Council Meeting**

Public hearing to solicit comments and determine public good or benefit demand occupations - begin with an overview of Maryland's economic climate and job market

Determine gross demand thresholds to be used to designate demand occupations*

Identify demand occupations to be matched with enrollment and graduation data*

*Signifies dates key decisions need to be made by the Advisory Council

Feb 26 – Mar 2   **Fourth Advisory Council Meeting**

Review and discuss the matching of graduation data with demand occupations

Determine public benefit occupations

Discuss thresholds to be used to determine critical need

Begin identifying critical occupations

April 16 – 20   **Fifth Advisory Council Meeting**

Determine critical need thresholds

Determine critical occupations to be included in the financial assistance program

May 29 – Jun 1   **Sixth Advisory Council Meeting**

Finalize selection of critical occupations*

Discuss program budget and determine allocation of funds across occupations and priorities for awarding if any

July 16 – 20   **Seventh Advisory Council Meeting**

Review and discussion of Draft Advisory Council Report to Commission including recommendations on critical shortage occupations to be included in or removed from the scholarship program

Sept. 10 – 14   **Eighth Advisory Council Meeting**

Finalize Advisory Council Report to the Commission*

Review and finalize guideline changes to administer the program for academic year 2008-2009

Oct. 2007   Advisory Council reports to the Finance Policy Committee of the Commission and recommended guidelines changes are presented

Nov 2007   Advisory Council presents its report to the Commission and the Commission discusses and approves guidelines changes

*Signifies dates key decisions need to be made by the Advisory Council

Appendix C

Workforce Shortage Student Assistance Grant Program
Administrative Timeline

July 2006	Legislation takes effect Advisory Council Appointed
Oct. 19, 2006	Guidelines approved by MHEC Finance Policy Committee for initial implementation of program with existing occupational areas
Nov. 15, 2006	Guidelines approved by MHEC for initial implementation of program with existing occupational areas
Jan. 2007	Program information and applications available for existing occupational areas
March 1, 2007	FAFSA deadline for students to be considered by need
June 1, 2007	Application deadline for students to be considered for an award
August 2007	Awards are made for existing occupational areas and students/institutions are notified
Oct. 2007	Finance Policy Committee to discuss and approve new guideline changes based on the Advisory Council's recommendations
Nov. 2007	MHEC to discuss and approve new guidelines that incorporate new critical shortage occupations
Jan. 2008	Program information and applications available incorporating new occupational areas identified by the Advisory Council and approved by MHEC
July 1, 2008	FAFSA deadline for students to be considered by need
July 1, 2008	Application deadline for students to be considered for an award
July 2008	Awards are made in new occupational areas

	Occupation Overview	Number of Individuals currently employed in occupation	Education Level Required and Pay Scale	Need for Additional Individuals in Population	Why need for financial assistance/Why scholarships would make a difference	Scholarship award amount	Comments
Maryland Dept. of Aging	Provide services to older individuals to enable them to live with choice, independence, and dignity throughout their lives.			Aging boom and exponential amount of older people retiring and needing geriatric care	Last year, Congress eliminated funding for the Title VII geriatric health professions training programs for FY06.		Currently 1.6 million baby boomers in Maryland, in the next twenty-five years, this population will constitute nearly 25% of the MD population. Individuals over 85 are the fastest growing segment of this population.
Mental Health Assoc. of MD, Maryland Senior Citizens Action Network	Geriatric care and aid to the elderly and aging population in MD.		Average wage for Certified Nursing Asst is $10/hr	Between 1990 and 2020, the population of people 85+ will increase by 122%. Currently there is a severe shortage of practitioners in mental health.	Workforce crisis is inevitable. Students are not interested in geriatric care, salaries are low, work is unappealing.		20% of Maryland's community dwelling elders, 42% of assisted living residents, and 54% of nursing home residents suffer from mental health problems.
MSDE	Teachers include nursery, elementary, middle, and secondary instructors. Over 58,000 teachers serve 860,000 students.	Over 58,000 teachers	BA required. Within ten years, all must have MA degree. Average salary is $44,946.	MD has experienced a teacher shortage for many years; MD is an 'import' state, producing only about half of the teachers required by the local school systems each year.	In order for MD to comply with *No Child Left Behind*, teachers need to be highly qualified; it is essential to have financial assistance for future teachers.		2006: hired over 8,000 teachers, largest amount ever. 1,439 were new graduates of MD's higher education institutions. 20.5% of these newly hired teachers were hired with conditional certificates, meaning they did not meet the qualifications.
Behavioral Health Assoc, Community Services, Families and Youth, Alcoholism & Drugs	Staff, employed by community agencies, assist individuals with mental or physical impairments (commonly called developmental disabilities) to live independently outside of an institutional setting.	6,000 staff currently in MD	Most only have high school diplomas.	Increasing percentage of population depend on mental health providers, regardless of population changes	Tuition assistance is usually the only source of higher education assistance for students in this field.		MD-22,000 people receiving community based support for developmental disabilities (retardation, cerebral palsy), over 16,000 waiting for services- the majority of these people are 'in crisis'

16

Mosaic Community Services	Residential Rehab Assistants, Residential Counselors, Rehab Assistants, Rehab Counselors, and Service Coordinators are the occupations in charge of enhancing the quality of life and promoting recovery through mental health services.	380 employees in organization	High school education required. Around $10/hr. Coordinators around $16,000/yr	Turnover trends show about 39% annual turnover in organization.	Education is costly and employee salaries are very low. Retention of employees is essential, financial assistance and scholarships would help this.	$3000/yr
Carol Porto Treatment Center, Department of Juvenile Services, Caroline County Health Dept	Addiction counselors and similar professions assist those who are in need of treatment and support in dealing with substance abuse usually of alcohol and drugs.			In youth centers, less than 12 staff, lost at least 2 staff every years, and it takes 18 months to replace staff. People leave addictions staff for better paying jobs or other opportunities with fewer responsibilities	With tuition assistance, current staff would get master's degrees, professional degrees, and recruit new staff.	
Reality Inc, Gaudenzia, CSC-AD M.A.T.T., Inc.	Addiction counselors including drug and alcohol counselors constitute a necessity in the State. They serve different communities and thousands of people each year, helping them advance and contribute to the State.		Different degrees are needed for different occupations.	Retention is the biggest problem, cannot find a supervisor. People are carrying caseloads of 40-50 clients	MD has around 15,000 people in jail. Many of these people leave jail and need to work; many of these people are working in addiction facilities. They want to further their education but do not have the resources	
The Arc of Anne Arundel County	Provide services to people with learning disabilities, autism, retardation, cerebral palsy, intense behavioral issues, etc. Staff works with families regarding guilt issues, overwhelming issues, family dynamic issues		Staff often starts at $10 an hour. No level of education is required.	Serve over 850 families and individuals a year. Turnover is well over 30% a year because overworked and underpaid	Positions have been open for over a year. Tuition assistance helps staff in a number of ways, including promotional opportunities	

University of MD, Baltimore	Graduates most amount of professionals of any institution in MD in fields such as medicine, pharmacy, nursing, law, etc.		MA or higher degree, salaries vary.		Average debt in dentistry, medicine, physical therapy, law, etc is average between $65,000 and $133,000. Tuition assistance would help alleviate this burden.		Registered nurses constitute the largest shortage, then physicians and surgeons, then pharmacists, dentists, and physical therapists.
Office of the Deaf and Hard of Hearing	Sign language interpreters serve to provide a language to those who are deaf or hard of hearing	300 in the MD, VA, and DC area	Minimum of a BA degree	There are approximately 550,000 deaf and hard of hearing residents in MD, this is overwhelming in comparison to the services available.	There is a strong need to make sure every interpreter has a BA with the new standards. Assistance is necessary to retain and recruit new interpreters.		Most interpreters are private and have their own practices. The cost for these interpreters is very high due to the demand.
Deaf Shalom Zone, Inc.	Private organization that positively impact the lives of deaf people.	In the 1980 census, there were 37,000 signing deaf people in MD.	BA minimum for certification	(same as above)	(same as above)		
Community College of Baltimore County	Interpreting program at CCBC for students to learn and get certified in interpreting; it is the only interpreting program in the State (?)			Strong need for interpreters, usually in medium to large cities. Highest concentration for interpreters in this area in the country,- because of Gallaudet University.	In 2008, a candidate for RID needs an Associates Degree, in 2012, BA is mandatory	$500-1000	About 10-15 graduates a year, however about 300 students enrolled each semester. About half have a BA already. Many students are getting the certificate to use in their current occupation or combine it in another field/career.

Audiology, Speech Language Pathology & Deaf Studies, Towson Univ.	These programs are meant to educate and certify students in Audiology, speech language pathology and deaf studies.	MD projections show there will be an increase of 960 jobs for speech pathologists in next 15 years.	BA minimum	With this growing number of jobs and increased demand for services, assistance is essential.	Scholarships would help attract and retain students in these fields, as they are already unpopular programs.	$4,000-$6,000 a year	Tuition assistance is needed to expand the number of students entering the undergraduate program and to fill the empty seats at the graduate level.
Occupational Therapy & Occupational Science	Occupational therapy is based on performing the meaningful activities of daily life (self-care skills, education, work, or social interaction), especially to enable or enhance participation in such activities despite impairments or limitations in physical or mental functioning.	121,000 practitioners total in US	Beginning Jan '07, post-BA degree is required; Average income of $54,660.	13% vacancy rate in 2005 for occupational therapists in MD hospitals	Assistance is needed to offset the costs of child care, transportation expenses, time spent in fieldwork, costs of textbooks, tuition, and fees	Between $500 and $1000	There are two types of programs; a cost effective community college education, the program can afford access to the profession for students interested in direct patient care.
Speech-Language Pathology/Audiology, Loyola College	Speech pathologists and audiologists serve the deaf and hard of hearing community and further their advancement.	34,000 more speech pathologists are needed in the next decade	BA required, MA needed for certain fields.	Vacancies are staggering; there are at least 103 vacancies in MD public schools	Standards for certain fields require graduate level education. Recruitment and retention is difficult, tuition assistance would be helpful		Speech language pathology attracts individuals who are committed to serving children and adults who have impairments. Many are changing careers, and others have depleted their financial resources and changing their majors or undergraduate careers.
Maryland Hospital Association	Personnel in MD hospitals have about 41 specific occupations in 11 hospital departments. Personnel range from doctors and nurses to support staff.		BA and higher degrees required for most positions.	Hospital-wide turnover rate averaged 15.5%, with rates only increasing each year	Assistance is needed for recruitment and retention of workers in MD hospitals		Nursing is the main occupation the Maryland Hospital Associations are concerned with.

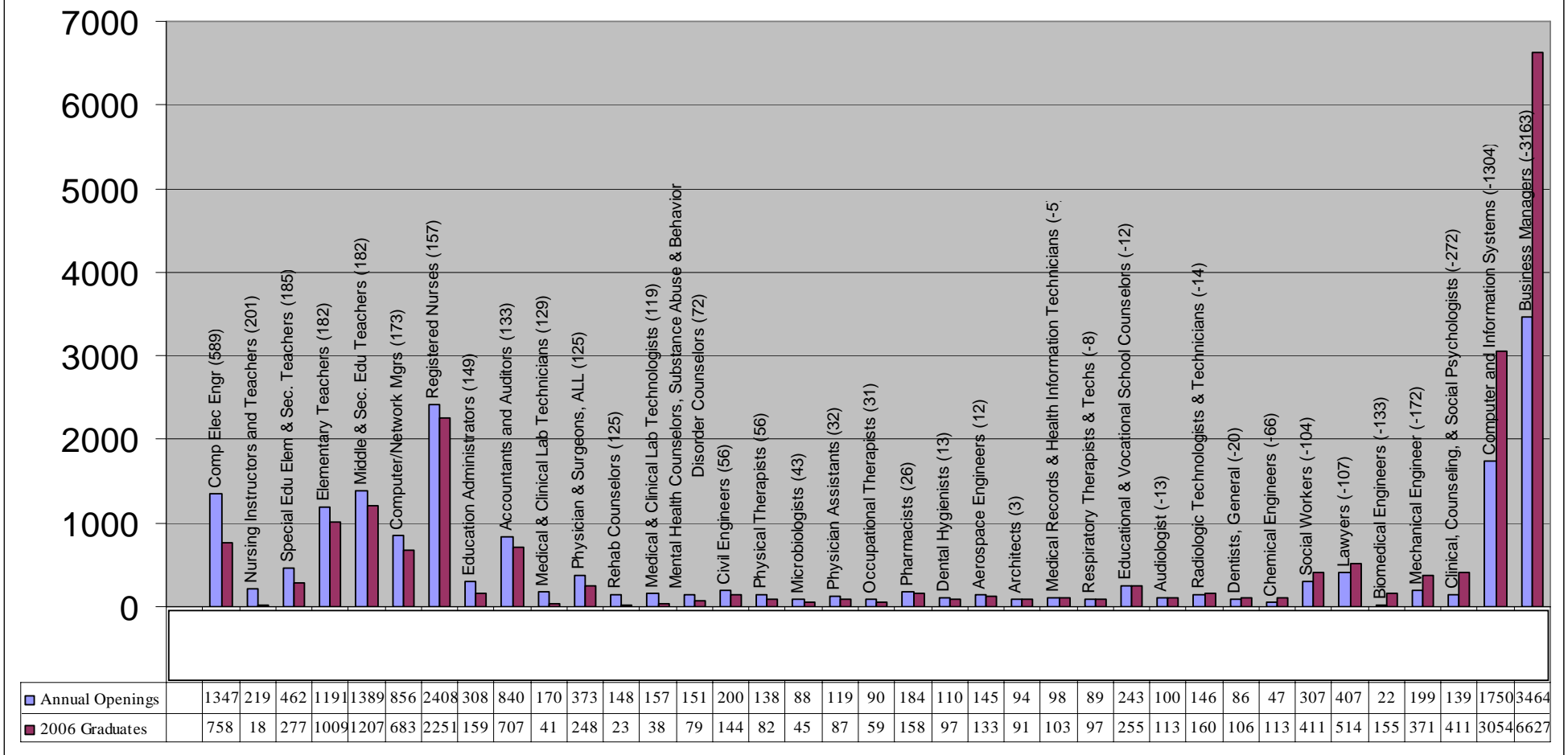| MHEC RANKING	Occupational Title	Estimated Employment 2004	Estimated Employment 2014	Ranked by 2014 Employment	Growth Openings	Ranked by Growth Openings	Total Openings	Ranked by Total Openings	Composite Score	Wage Growth 2000-2005	Wage Growth 2003-2005	Usual Education Requirement
1	Business Managers[1]	103,270	120,560	1	17,290	1	34,640	1	3	2.03%	22.34%	Bachelor's degree
2	Registered Nurses	48,595	62,510	3	13,915	2	24,080	2	7	21.08%	8.74%	Associate degree
3	Computer & Information Systems[2]	57,345	69,255	2	11,905	3	20,425	3	8	13.53%	7.47%	Bachelor's degree
4	Computer Engineering and Electrical Engineering[3]	31,360	42,200	4	10,850	4	14,455	4	12	21.71%	9.01%	Bachelor's degree
5	Middle and Secondary School Teachers, Except Special and Vocational Education[4]	29,820	36,005	5	6,190	7	13,895	5	17	9.97%	5.88%	Bachelor's degree
6	Elementary School Teachers, Except Special Education	25,695	31,935	6	6,240	6	11,910	6	18	27.07%	5.17%	Bachelor's degree
7	Computer/Network Managers[5]	15,240	22,065	8	6,815	5	8,560	7	20	26.11%	8.19%	Bachelor's degree
8	Accountants and Auditors	24,675	28,415	7	3,740	8	8,400	8	23	22.11%	8.58%	Bachelor's degree
9	Special Education Teachers, ALL[6]	7,935	10,665	11	2,730	9	4,620	9	29	21.40%	9.05%	Bachelor's degree
10	Lawyers	14,165	16,420	9	2,250	10	4,070	10	29	35.32%	20.10%	First professional degree
11	Physicians and Surgeons, ALL[12]	9,615	14,470	10	2,070	11	3,730	11	32	N/A	N/A	First professional degree
12	Social Workers[7]	7,595	8,805	12	1,765	12	3,065	13	37	2.13%	21.24%	Master's degree
13	Education Administrators[8]	7,350	8,600	13	1,250	13	3,075	12	38	23.26%	27.65%	Bachelor's or higher degree, plus work experience
14	Educational, Vocational, and School Counselors	5,560	6,720	14	1,160	14	2,430	14	42	2.76%	-4.56%	Master's degree
15	Civil Engineers	5,405	6,540	15	1,135	15	1,995	16	46	32.80%	14.19%	Bachelor's degree
16	Health Specialties Teachers, Postsecondary & Nursing Instructors and Teachers[9]	4,885	5,970	16	1,085	16	2,185	15	47	15.00%	5.81%	Master's degree
17	Pharmacists	4,440	5,420	17	980	18	1,840	18	53	26.29%	10.96%	First professional degree
18	Mechanical Engineers	4,670	5,375	18	705	26	1,985	17	61	25.29%	8.87%	Bachelor's degree
19	Medical and Clinical Laboratory Technicians	3,595	4,325	20	730	24	1,700	19	63	2.03%	13.95%	Associate degree
20	Physical Therapists	3,130	4,205	22	1,075	17	1,385	26	65	13.94%	4.17%	Bachelor's degree
21	Radiologic Technologists and Technicians[10]	3,445	4,260	21	815	21	1,460	23	65	23.53%	9.72%	Associate degree
22	Mental Health Counselors, Substance Abuse and Behavioral Disorder Counselors[11]	3,195	3,965	24	780	23	1,505	21	68	16.44%	2.47%	Master's degree
23	Rehabilitation Counselors	2,970	3,770	26	800	22	1,480	22	70	34.16%	15.05%	Master's degree
24	Medical and Clinical Laboratory Technologists	3,580	4,180	23	600	30	1,565	20	73	1.68%	13.94%	Bachelor's degree
25	Clinical, Counseling, and School Psychologists	3,080	3,795	25	715	25	1,390	25	75	30.37%	19.87%	Doctoral degree
26	Aerospace Engineers and Operations Technicians	4,285	4,680	19	395	32	1,450	24	75	14.07%	6.17%	Bachelor's degree
27	Dental Hygienist	2,310	3,205	29	900	19	1,095	28	76	11.03%	-0.53%	Associate degree
28	Physician Assistants	2,155	3,005	31	855	20	1,185	27	78	26.90%	33.99%	Bachelor's degree
29	Architects, Except Landscape and Naval	2,615	3,250	28	635	27	935	31	86	38.33%	13.77%	Bachelor's degree
30	Medical Records and Health Information Technicians	2,440	3,070	30	630	28	975	30	88	2.58%	26.13%	Associate degree
31	Audiologist Speech-Language Pathologists & Audiologists[13]	2,465	2,870	32	405	31	1,015	29	92	19.61%	20.60%	Master's degree
32	Occupational Therapists	2,005	2,630	33	625	29	895	32	94	12.91%	5.37%	Master's degree
33	Dentists, General	3,235	3,545	27	310	35	855	35	97	N/A	N/A	First professional degree
34	Respiratory Therapists and Technicians[14]	1,875	2,235	34	355	34	885	33	101	N/A	N/A	Associate Degree
35	Microbiologists	1,615	1,990	35	375	33	880	34	102	31.35%	11.03%	Doctoral degree
36	Chemical Engineers	920	1,115	36	195	36	470	36	108	16.19%	9.38%	Bachelor's degree
37	Biomedical Engineers	415	560	37	145	37	215	37	111	41.66%	14.28%	Bachelor's degree

Source: 2004-2014 Occupational Projections – Department of Labor Licensing and Regulation &
2000-2005 and 2003-2005 Wage Data – Bureau of Labor Statistics website

Appendix E Document Footnotes

1. Business Managers include: Financial Managers, General and Operations Managers, Management Analysts, Administrative Service Managers, Marketing Managers, Financial Analysts, Budget Analysts, Logisticians, and Advertising and Promotions Managers.
2. Occupations within Computer and Information Systems include: Computer and Information Systems, Computer and Information Systems Managers, Computer Programmers, Computer and Systems Analyst, and Computer and Support Specialist.
3. Occupations within Computer Engineering and Electrical Engineering include: Computer Engineers, Computer Hardware Engineers, Computer Software Engineers, Computer Software Engineers – Applications, Computer Software Engineers – Systems Software, and Electrical Engineers.
4. Middle and Secondary School Teachers, Except Special and Vocational Education: Middle and Secondary school teacher occupations were combined in this category.
5. Computer/Network Managers include: Computer and Network Managers, Network and Computer Systems Administrators, and Network Systems and Data Communication Analysts.
6. Special Education Teachers, ALL: All the special education teaching categories from early-childhood to secondary were combined.
7. Social Workers: Different specializations of social work were combined.
8. Education Administrators includes Education Administration and Education Leadership.
9. Health Specialty Teachers, Postsecondary & Nurse Instructors and Teachers: Towson University is the only institution that graduates students specifically for Nursing Instruction. However, other schools with graduate nursing students may have graduates enter nurse instruction, but there is no clear way of determining how many students choose this occupation from those graduate programs.
10. Radiologic Technologists and Radiologic Technicians were combined.
11. Mental Health Counselors, Substance Abuse and Behavioral Disorder Counselors were combined.
12. The Physician and Surgeon specialty occupations were all combined into one major category labeled 'Physicians & Surgeons, ALL'
13. Audiologist Speech-Language Pathologists & Audiologists were combined. Data and evidence from the public hearing by professionals in this field combined these occupations as well.
14. Respiratory Therapists and Technologists were combined.

2006 Graduates vs. Annual Openings

(Occupation data shown by greatest gap in descending order)

	Comp Elec Engr (589)	Nursing Instructors and Teachers (201)	Special Edu Elem & Sec. Teachers (185)	Elementary Teachers (182)	Middle & Sec. Edu Teachers (182)	Computer/Network Mgrs (173)	Registered Nurses (157)	Education Administrators (149)	Accountants and Auditors (133)	Medical & Clinical Lab Technicians (129)	Physician & Surgeons, ALL (125)	Rehab Counselors (125)	Medical & Clinical Lab Technologists (119)	Mental Health Counselors, Substance Abuse & Behavior Disorder Counselors (72)	Civil Engineers (56)	Physical Therapists (56)	Microbiologists (43)	Physician Assistants (32)	Occupational Therapists (31)	Pharmacists (26)	Dental Hygienists (13)	Aerospace Engineers (12)	Architects (3)	Medical Records & Health Information Technicians (-5)	Respiratory Therapists & Techs (-8)	Educational & Vocational School Counselors (-12)	Audiologist (-13)	Radiologic Technologists & Technicians (-14)	Dentists, General (-20)	Chemical Engineers (-66)	Social Workers (-104)	Lawyers (-107)	Biomedical Engineers (-133)	Mechanical Engineer (-172)	Clinical, Counseling, & Social Psychologists (-272)	Computer and Information Systems (-1304)	Business Managers (-3163)
Annual Openings	1347	219	462	1191	1389	856	2408	308	840	170	373	148	157	151	200	138	88	119	90	184	110	145	94	98	89	243	100	146	86	47	307	407	22	199	139	1750	3464
2006 Graduates	758	18	277	1009	1207	683	2251	159	707	41	248	23	38	79	144	82	45	87	59	158	97	133	91	103	97	255	113	160	106	113	411	514	155	371	411	3054	6627

Comparison of Annual Openings and Graduation Data

Occupations	Annual Openings	2006 Graduates	Difference Between Projected Total Annual Openings & Graduates in 2006	
			#	%
Computer and Electrical Engineer	1347	758	589	44%
Health Specialties Teachers, Postsecondary & Nursing Instructors and Teachers	219	18	201	92%
Special Education Elementary & Secondary Teachers	462	277	185	40%
Elementary Teachers	1191	1009	182	15%
Middle and Secondary Education Teachers	1389	1207	182	13%
Computer/Network Managers	856	683	173	20%
Registered Nurses	2,408	2,251	157	7%
Education Administrators	308	159	149	48%
Accountants and Auditors	840	707	133	16%
Medical and Clinical Laboratory Technicians	170	41	129	76%
Physician and Surgeons, ALL	373	248	125	34%
Rehabilitation Counselors	148	23	125	84%
Medical and Clinical Laboratory Technologists	157	38	119	76%
Mental Health Counselors, Substance Abuse and Behavior Disorder Counselors	151	79	72	48%
Civil Engineers	200	144	56	28%
Physical Therapists	138	82	56	41%
Microbiologists	88	45	43	49%
Physician Assistants	119	87	32	27%
Occupational Therapists	90	59	31	34%
Pharmacists	184	158	26	14%
Dental Hygienists	110	97	13	12%
Aerospace Engineers	145	133	12	8%
Architects	94	91	3	3%
Medical Records and Health Information Technicians	98	103	-5	-5%
Respiratory Therapists & Techs	89	97	-8	-9%
Educational & Vocational School Counselors	243	255	-12	-5%
Audiologist Speech-Language Pathologists & Audiologists	100	113	-13	-13%
Radiologic Technologists and Technicians	146	160	-14	-10%
Dentists, General	86	106	-20	-23%
Chemical Engineers	47	113	-66	-140%
Social Workers	307	411	-104	-34%
Lawyers	407	514	-107	-26%
Biomedical Engineers	22	155	-133	-605%
Mechanical Engineer	199	371	-172	-86%
Clinical, Counseling, and Social Psychologists	139	411	-272	-196%
Computer and Information Systems	1750	3054	-1304	-75%
Business Managers	3464	6627	-3163	-91%

Priority List Covered by a MHEC Program			Difference Between Projected Total Annual Openings & Graduates in 2006		
Occupations	**Annual Openings**	**2006 Graduates**	**#**	**%**	**Priority Area**
Health Specialties Teachers, Postsecondary & Nursing Instructors and Teachers (Nurse Faculty currently eligible)	219	18	201	92%	Workforce
Special Education Elementary & Secondary Teachers	462	277	185	40%	Workforce
Elementary Teachers (Title 1/Needs Improvement or Shortage Areas)	1191	1009	182	15%	LARP
Middle and Secondary Education Teachers (Title 1/Needs Improvement or Shortage Areas)	1389	1207	182	13%	Workforce/LARP
Registered Nurses	2,408	2,251	157	7%	Workforce
Physician and Surgeons, ALL	373	248	125	34%	LARP
Rehabilitation Counselors	148	23	125	84%	Workforce
Mental Health Counselors, Substance Abuse and Behavior Disorder Counselors	151	79	72	48%	Workforce
Physical Therapists	138	82	56	41%	Workforce/LARP
Physician Assistants	119	87	32	27%	LARP
Occupational Therapists	90	59	31	34%	Workforce/LARP
Audiologist Speech-Language Pathologists & Audiologists	100	113	-13	-13%	Workforce/LARP
Dentists, General	86	106	-20	-23%	LARP
Social Workers	307	411	-104	-34%	Workforce/LARP
Lawyers	407	514	-107	-26%	LARP
Clinical, Counseling, and Social Psychologists	139	411	-272	-196%	Workforce
Workforce: Included in the current Workforce Shortage Student Assistance Grant Program					
LARP: Loan Assistance Repayment Program					

Public Benefit Occupations NOT Covered by a MHEC Program

Occupations	Degree Requirement	Annual Openings	2006 Graduates	Average Wage 2005	Difference Between Projected Total Annual Openings & Graduates in 2006		Supporting Reports	Proposed Program
					#	%		
Education Administrators	Bachelor's	308	159	$79,465	149	48.38%	MSDE*	LARP
Medical and Clinical Laboratory Technicians	Associate	170	41	$36,850	129	75.88%	DHMH*	Scholarship
Medical and Clinical Laboratory Technologists	Bachelor's	157	38	$52,960	119	75.80%	DHMH*	Scholarship
Pharmacists	First Professional	184	158	$85,350	26	14.13%	DHMH*	LARP
Dental Hygienists	Associate	110	97	$54,880	13	11.82%	DHMH*	Scholarship
Medical Records and Health Information Technicians	Associate	98	103	$33,980	-5	-5.10%	DHMH*	Scholarship
Respiratory Therapists & Techs	Associate	89	97	$53,565	-8	-8.99%	DHMH*	Scholarship
Educational & Vocational School Counselors	Master's	243	255	$43,940	-12	-4.94%	MSDE*	Both
Radiologic Technologists and Technicians	Associate	146	160	$54,170	-14	-9.59%	DHMH*	Scholarship
MSDE*: "*Maryland Teacher Staffing Report 2006-2007*" - Maryland State Department of Education								
DHMH*: Appears on the Department of Health and Mental Hygiene's Health Occupations Shortage List for 2006[2]								
BRAC*: "*Educational Needs Assessment: Supply and Demand of Educational Programs Likely to Support the DOD BRAC Movements into Maryland*" 2006,								
Science Applications International Corporation for the Maryland Department of Business and Economic Development.								
RAGS*: "*Rising Above the Gathering Storm*," National Academy of Sciences, National Academy of Engineering and the Institute of Medicine								

Economic Development Fields NOT Covered by a MHEC Program

Occupations	Degree Requirement	Annual Openings	2006 Graduates	Average Wage 2005	Difference Between Projected Total Annual Openings & Graduates in 2006		Supporting Reports	Proposed Program
					#	%		
Computer and Electrical Engineer -	Bachelor's	1347	758	$87,595	589	43.73%	BRAC/RAGS*	Scholarship
Computer/Network Managers	Bachelor's	856	683	$86,655	173	20.21%	RAGS*	Scholarship
Accountants and Auditors	Bachelor's	840	707	$60,980	133	15.83%		
Civil Engineers	Bachelor's	200	144	$69,270	56	28.00%	RAGS*	Scholarship
Microbiologists	Bachelor's	88	45	$84,140	43	48.86%		Scholarship
Aerospace Engineers	Bachelor's	145	133	$85,210	12	8.28%	RAGS*	Scholarship
Architects	Bachelor's	94	91	$66,410	3	3.19%		Scholarship
Chemical Engineers	Bachelor's	47	113	$79,030	-66	-140.43%	RAGS*	Scholarship
Biomedical Engineers	Bachelor's	22	155	$84,330	-133	-604.55%	RAGS*	Scholarship
Mechanical Engineer	Bachelor's	199	371	$75,460	-172	-86.43%	RAGS*	Scholarship
Computer and Information Systems	Bachelor's	1750	3054	$67,620	-1304	-74.51%	BRAC/RAGS*	
Business Managers	Bachelor's	3464	6627	$96,706	-3163	-91.31%		
MSDE: "*Maryland Teacher Staffing Report 2006-2007*" - Maryland State Department of Education								
DHMH*: Appears on the Department of Health and Mental Hygiene's Health Occupations Shortage List for 2006[2]								
BRAC*: "*Educational Needs Assessment: Supply and Demand of Educational Programs Likely to Support the DOD BRAC Movements into Maryland*" 2006,								
Science Applications International Corporation for the Maryland Department of Business and Economic Development.								
RAGS*: "*Rising Above the Gathering Storm,*" National Academy of Sciences, National Academy of Engineering and the Institute of Medicine								

Source: 2004-2014 Occupational Projections – Department of Labor and Licensing
and Regulation, 2000-2005 and 2003-2005 Wage Data – Bureau of Labor Statistics,
and MHEC Degree Information System