

EXECUTIVE SUMMARY

Maryland has thoroughly integrated program, accountability and fiscal systems to improve Career and Technology Education (CTE). The use of accountability data for both state leadership and local planning has been tied to fiscal resources for program improvement.

A variety of initiatives in CTE were planned and executed at the state and local levels during fiscal year 2005. These activities were designed to provide technical assistance to local school systems and community colleges; develop leadership for improving CTE programs; offer professional development opportunities for educators, administrators and guidance counselors; ensure access to technology; and implement other related activities that assisted local school systems and community colleges in their efforts to meet or exceed the state levels of performance. Key initiatives were continuous improvement of CTE programs and implementation of the CTE Pathway Programs through Maryland's ten career clusters.

Accountability data was utilized at the local level to focus resources for raising student achievement. Local plans included activities to improve student achievement, increase academic and technical skill proficiency for career and technology education program participants, increase educator expertise, and other elements necessary to improve existing programs or develop new career and technology education programs.

Career and Technology Education efforts focused on increasing the number of students enrolled in non-traditional programs and meeting the needs of special populations. Performance measures provided information about non-traditional and special populations and assisted Maryland with efforts to continue to meet the needs of these groups. Activities conducted to assist these groups included: working with special populations to meet or exceed high levels of performance; addressing the needs of at-risk students; promoting non-traditional employment opportunities; and serving individuals in state correctional institutions.

The State Tech Prep Plan included the following components: utilizing core indicators of performance for local Tech Prep plans; continuing collaboration between secondary and post-secondary institutions to ensure that rigorous programs are in place; incorporating Maryland's Core Learning Goals, revising of the Maryland Career Development Model to include lesson plans, industry standards in Tech Prep-funded programs; providing multiple professional development for teachers and counselors; and ensuring equal access for special populations.

In order to carry out these activities and initiatives, the state has utilized its negotiated levels of performance to measure the success of these activities and initiatives. Maryland has improved the quality of the data that is collected so it is more useful to local school systems and community colleges as they create new programs, make funding decisions, and develop initiatives to improve the achievement of students. Maryland has reviewed data from the core indicators of performance, and required this data to be used by school systems and community colleges in local plan development. Data from the core indicators of performance allowed the state to identify the impact of this fiscal year's successful activities to impact activities planned for the next fiscal year.

I. PROGRAM ADMINISTRATION:

The first aspect of the program administration portion of the plan is the continuous improvement and development of Career and Technology Education programs. Local school systems and Community Colleges create a local plan for improvement. The state provided guidelines using the progress made in each of the core indicators of performance, and negotiates strategies and activities prior to plan approval.

A. Improving and Expanding the Use of Technology in Career and Technology Education Programs

The following is a summary of the activities and accomplishments in the improvement and development of career and technology education programs:

Maryland Plan for Technology in Education

In keeping with the Maryland Plan for Technology in Education, Maryland's twenty-four local school systems (LSS) are each responsible for ensuring that teachers are competent in using and integrating technology into student learning activities. Currently, teachers are responsible for helping students understand and use technology appropriately as defined by Maryland's Curricular Framework for Technology Education. A voluntary state curriculum for Technology Education was completed and is being presented to the Maryland State Board of Education for approval in September 2005. According to an annual survey produced by the Maryland Business Roundtable for Education Committee on Technology in Education, the following statistics are reported:

- 95% of all Maryland classrooms are connected to the Internet- up from 82% in 2001;
- The Mid to High capacity student-to-computer ratio is 4.3:1 versus 6:1 in 2000;
- 74% of all Maryland teachers have intermediate or higher knowledge of computer skills- an increase of 3%; and
- 68% have intermediate or higher knowledge of Internet use- an increase of 4%.

The Maryland Plan for Technology in Education 2002-2005 is Maryland's blueprint for the effective utilization of technologies in schools statewide. The revised 3-year plan is currently being implemented.

Use of VTECS as a Technology in Program Development and Curriculum Planning

VTECS Direct is a database program designed to manage information about technical standards, performance measures and academic standards linked to technical standards. Along with the alignment of academic and industry standards, Maryland worked with the software developers to align Maryland's Career Cluster Frameworks with VTECS Direct-5. Additionally, VTECS Direct will be used to house model career pathways of high quality, industry validated Career and Technology Education (CTE) programs so all staff in local school systems can access standards as they build their CTE programs.

VTECS Connect is a relational database designed to manage information concerning students participating in work-based learning opportunities. This software allows work-based learning coordinators to customize training plans for students to align what they learn in school (both academic and technical) with on-the-job skills. In an on-going effort to align standards and increase access to high quality work-based learning opportunities, Maryland delivered the following:

- In January of 2005, Maryland partnered with VTECS to conduct four computer-based training sessions on the use of VTECS Direct and VTECS Connect, upgrading the session offerings to increase the skills of the current software users;
- At the January training session, several individuals (work-based learning coordinators, teachers and administrators) learned how to use the programs and how to incorporate the information from VTECS into CTE classes;
- In FY 2005, Maryland provided on-site training for eight school systems, training both CTE faculty members and work-based learning coordinators;
- Maryland continues to survey statewide users to better meet customer needs in terms of software distribution, training and recording best practices.
- Maryland continues to make the use of VTECS software systemic throughout local school systems. Two local school systems are requiring the use of specific reporting functions and have contracted with the VTECS software engineers to customize those reports to meet their needs.
- National Academy Foundation (NAF) directors find VTECS Connect a useful tool for their students involved in school-to-work programs. Academy students are required to have an internship between their junior and senior years. The NAF directors use VTECS to assist in aligning their program standards to what students should be learning at the workplace.

B. Improving or Developing New Career and Technology Education Programs

Integrating Academic and Career and Technology Education

Maryland supports the integration of academic and career and technology education through a variety of initiatives. Blended Instruction (BI) has been a prominent vehicle for providing professional development to secondary and postsecondary educators on how to integrate instruction through curriculum alignment and project-based learning. Maryland also supports schools redesigning around career-focused smaller learning communities and in upgrading Career and Technology Education (CTE) programs around broad career clusters and pathways. This model creates a system where all students are challenged to higher academic achievement through a sequence of courses and instructional practices that require students to demonstrate mastery of academic and technical content. Maryland supported this initiative in the following ways:

- State staff has worked with Local School System (LSS) and individual high schools to align courses and programs of study around career clusters and pathways. The development of career pathways includes sequencing academic and technical courses at the secondary and post-secondary levels to ensure student success after high school;

- Through the support of a Tech Prep incentive grant, one local school system is supporting an advanced integration project that provides career development activities at secondary and postsecondary levels aligned to the career clusters and career pathways of the LSS.

Career Cluster Frameworks

Maryland’s Career Cluster system is described in a 2003 publication which includes an overview and guide to the 10 career clusters. The career clusters were developed and validated in facilitated, employer focus group sessions and represent key economic sectors of Maryland’s economy. Each career cluster is defined by the core business functions of the particular industry. These core functions became the career pathways for each cluster. Each career pathway also includes the full range of careers from those requiring less than a four-year college degree through those requiring more than a four-year degree.

To facilitate the development of new programs and the continuous improvement of existing programs, MSDE has identified CTE *Fast Track* programs. These are CTE programs that not only meet the requirements for program approval, but also include curriculum and professional development resources that ensure high quality and allow them to be replicated by local school systems. *Fast Track* options have been vendor developed (e.g. Project Lead The Way – Pre Engineering) or developed through a statewide collaboration process following the state policies and procedures (e.g. Maryland Academy for Teacher Education). The following key elements are a part of all *Fast Track* programs and other model CTE Pathway Programs:

- Standards-based curriculum aligned to industry/technical skill standards, academic standards, and skills for success;
- Value-added options for students through industry certification, advanced standing, or college credit earned while in high school;
- Work-based learning opportunities for students directly related to the CTE pathway program;
- Oversight and quality assurance through program certification and/or industry advisory groups;
- Teacher professional development for initiation of the program as well as on-going upgrades; and
- Program sustainability plan for costs for implementation and ongoing quality to keep pace with industry requirements.

Credentialing of Student Learning

To place greater emphasis on accountability and to document student success, Maryland revised the CTE program approval process to provide direct links to credentialing and developed a program approval process for “Fast Track” programs. Fast Track programs are CTE programs that meet additional standards for program quality including the certification or credentialing of students through industry certification and/or postsecondary credits. Currently, state-approved “Fast Track” programs include:

- Automotive Technology;
- Careers in Cosmetology;

- Construction and Development and Building Maintenance (based on the NCCER Standards - National Center for Construction Education and Research);
- Database Academy (Oracle);
- Fire Science;
- National Academy Foundation (NAF) programs in Finance, and Information Technology;
- Networking Academy (Cisco);
- Printing Technologies;
- Project Lead The Way Pre-Engineering programs with pathways in Civil Engineering and Architecture and Computer Integrated Manufacturing; and
- Teaching Professions.

Additional program areas under development for Fast Track designation include two pathways with the Health and Bioscience Cluster – Biomedical Studies and the Academy of Health Professions and the Business, Management and Finance Cluster which includes four pathways with two foundation courses applicable to all four pathways: Business Management, Accounting, Marketing, and Administrative Services. Development for these programs will continue into FY 2006.

High Schools That Work/Making Middle Grades Work

In FY 05 Maryland continued to support the efforts of *High Schools That Work (HSTW)* and *Making Middle Grades Work (MMGW)* initiatives. The following activities were conducted to support these initiatives:

- *MMGW* Data Training was offered to assist schools in analyzing their 2004 NAEP-based assessment results;
- Tech Prep Incentive grants provided funding in excess of \$79,000 to schools/systems to support the State and National *HSTW* initiatives;
- Orientation Workshops were conducted for incoming sites;
- *HSTW* Technical Assistance Visits were conducted at four high schools; and
- *MMGW* Technical Assistance Visits were conducted at six middle schools.

C. Local Perkins Plan Application

The local Perkins Plan addressed how local recipients planned to increase the numbers and percentage of students achieving challenging state standards for academic, occupational and related workplace skill proficiencies. The Plan included how local programs planned to achieve state standards and additional local evaluation measures for student achievement. It focused on data based decision making to address gaps identified by Indicators and Sub-Indicators for each of the four “Core Indicators of Performance.”

Local school systems and community colleges used these Indicators to map out strategies, which assisted them in meeting the levels of performance. Technical assistance was provided in the form of statewide workshops, as well as individual assistance from the Regional Coordinators to all local school systems and community colleges. Maryland provided data to each local school system and community college to help them determine their relative performance for each of the

core indicators of performance. Additionally each local recipient was provided program data at the Classification of Instructional Program (CIP) level for each Sub-Indicator and by race, gender, and special population to assist in “drilling down” to target specific programs and student populations for improvements.

D. Preparation for High Skill, High Wage Jobs in Current and Emerging Occupations

Labor Market Information

Maryland’s Labor Market Information (LMI) has been organized around the 10 career clusters and pathways. The full range of careers presented in the Maryland Career Clusters publication and support materials have been aligned with the State Occupational system which is ONET. The Career Cluster/LMI system includes education, state licensure and certification requirements.

Maryland’s Career Development Model

A K-Postsecondary/Adult Career Development Framework was developed through the State Career Development Council. It is a companion document with the Maryland Career Clusters booklet. The purpose of this standards-based framework is to enable students to select a career cluster and develop a program sequence. The sequenced program of study becomes part of a secondary-postsecondary plan in reference to the Code of Maryland Regulations for Pupil Services.

The framework is standards-based and aligned with the format of the Voluntary State Curriculum (VSC) and levels of cognitive demand represented in the VSC. The six standards are based on six process steps including Self Awareness, Career Awareness, Career Exploration, Career Preparation, Job- Seeking/Advancement; and Career Satisfaction, Re-Focus and Transition. Decision-Making skills are incorporated as indicator statements for each of the six standards. Additional content is derived from the revised National Career Development Guidelines, Maryland’s *Skills For Success*, and the National Standards for School Counseling Programs. The Career Development Framework has lesson plans for grades 2, 5, 8, and 9 related to the objectives and aligned with the content standards in Science, Mathematics, English, and Social Studies of the VSC. On-going development of model lesson plans will focus on the postsecondary and adult community. The lessons will integrate national standards, *Equipped for the Future*, designed for adult learners and workforce development. Regional training will be provided in February and March 2005.

E. Professional Development

Maryland provided a variety of professional development opportunities for faculty, administrators, and counselors at both the secondary and postsecondary levels. In addition, Maryland collaborated with postsecondary institutions to support pre-service professional development opportunities for emerging teachers. The following is a list of the major professional development opportunities provided by Maryland.

- Professional development was offered to local school systems and community colleges on Maryland’s Career Development Model;
- A *HSTW* conference and a middle school site development workshop were held. Currently, there are 24 *HSTW* sites and 18 *MMGW* sites; and
- VTECS training was offered in a variety of ways: one statewide session was held and two school systems offered training and had their faculty and administrators trained in the use of VTECS Connect.

In addition to these activities, Maryland provided professional development to a cadre of Technology Education teachers on the new Voluntary State Curriculum (VSC). Maryland has also provided support on the development of a VSC for Family and Consumer Sciences. It has also provided input to the Division of Certification and Accreditation on the Praxis exams for two certification areas: Trades and Industry and Family and Consumer Sciences.

F. Involving Parents, Teachers, Local Businesses and Labor Organizations in Career and Technology Education Programs

Maryland’s history of education reform is based on a collaborative model inclusive of stakeholder groups. Groups such as the High School Assessment Task Force, Maryland Business Roundtable, Governor’s Workforce Investment Board, and the Local Advisory Committees all involve parents, teachers, business and industry. Most notably, MSDE utilized these stakeholder groups as it validated each of the 10 Career Clusters and identified the technical content standards for each of the pathways within the clusters.

In addition, as part of the CTE program approval process, LSSs realign and upgrade CTE programs using the Career Cluster Frameworks. As new programs are developed, LSS use Program Advisory Committees (PAC) that represent the full range of occupations in a career cluster. LSSs specify the contribution of each PAC member in terms of providing industry standards, program development resources, and/or work-based learning opportunities.

G. Improving the Academic and Technical Skills of Students Participating in Career and Technology Education Programs

Maryland currently has in place a number of initiatives that are designed to raise academic expectations. These initiatives include the Maryland State Performance Assessment Program and the High School Assessment Program. A statewide assessment system, promotes rigor and higher-level skills, which are demanded in the workplace and higher education. Career and Technology Education programs are linked to these initiatives and support the skills and content via Maryland’s Skills for Success and the reinforcement of academic standards through curriculum integration and/or Blended Instruction.

The Blended Instruction Model is the vehicle by which Career and Technology Education programs synthesize rigorous academic skills with technical content. Professional Development opportunities during the past year have provided many educators and administrators with the tools needed to develop rigorous technical programs that meet high academic standards as well as national occupational skill standards. The framework, developed by the Southern Regional

Education Board, has provided a model for continuous improvement in Career and Technology Education programs that links high academic and technical standards.

H. Ensuring That Participants in Career and Technology Education Programs are Taught Challenging Academic Proficiencies

The *High Schools That Work (HSTW)* initiative has provided Maryland with a vehicle for school reform in career and technology education programs. As a member of this network, Maryland has provided schools with the opportunity to become a *HSTW* site. One of the key practices of this network is a means to leverage resources necessary for increasing the academic proficiencies of students enrolled in career and technology education programs. The data provided to the schools who are members of the network allows educators and administrators to see gaps in the rigor of academic areas while promoting the technical skills needed in the workplace.

Maryland continues to promote challenging CTE programs such as Project Lead The Way Pre-Engineering, the National Academy of Information Technology (AOIT) and Cisco Networking. Academic components of these rigorous programs are aligned to the industry-related curricula. It is a requirement that students in an AOIT participate in a quality work-based learning experience. VTECS Connect assists coordinators in creating individualized training plans for students, aligning what they learn in school (both academic and technical) with on-the-job skills.

I. Providing Technical Assistance to Local Recipients

Technical assistance to local school systems and community colleges is a critical component of the role of the branches of Career and Technology Education within the Division of Career Technology and Adult Learning at the Maryland State Department of Education.

The Governance Structure for Career and Technology Education in Maryland is as follows:

Maryland State Board of Education (MSBOE)

The Board takes action on matters of the Maryland public schools. It approves policy including graduation requirements. The MSBOE serves as the State Board for Career Technology Education and annually convenes a meeting to address CTE issues.

The Maryland State Department of Education is the direct recipient of Perkins funds. The Division of Career Technology and Adult Learning administers career and technology education programs. The three CTE branches of the division are: Student and Assessment Services; Instruction; and Systems. These three branches provide leadership, guidance and technical assistance to local school systems and community colleges. They assist in the development of programs and plans, and have provided technical assistance. Examples of the leadership provided by these branches includes training for new directors, quarterly meetings for directors and deans of community colleges, as well as joint meetings with deans and directors. In addition, individualized assistance is provided for local school systems and community colleges on an as needed basis.

Maryland Higher Education Commission

The Maryland Higher Education Commission provides a direct link between Secondary and Postsecondary CTE programs. Postsecondary programs that are articulated are submitted to the Maryland State Department of Education for approval, and this program development process links learning at the Secondary and Postsecondary levels.

Local Boards of Education

Local boards of education are the public authority legally responsible for educational matters that affect their local school system. They are free to impose additional requirements at the local level; however, all state requirements must be met.

J. Career and Technology Education and State and Regional Occupational Opportunities

MSDE works in collaboration with several state workforce development agencies on numerous economic priorities. These agencies include: the Department of Business and Economic Development (DBED); the Department of Labor, Licensing and Regulation (DLLR); the Governor's Workforce Investment Board (GWIB); the Maryland Higher Education Commission (MHEC); as well as local entities such as school systems, representatives at the postsecondary level, business and labor. This collaboration has led to the development of cluster templates for Maryland's growing industries. The mapping of ten career clusters has led to the development of new programs that prepare students to enter the workplace in high growth and high wage areas.

K. Methods for Joint Planning and Coordination of Perkins III Programs with Other Federal Education Programs

MSDE staff serve on committees for the GWIB, Maryland's Workforce Development entity, to develop and continually improve Maryland's workforce preparation system. Another method of joint planning is the requirement that the local superintendent of schools and the occupational dean of the community college serve on the Local Workforce Investment Board. Many times the superintendent appoints the Local Director of Career and Technology Education to serve in his/her place on this committee.

L. Linking Secondary and Postsecondary Education

Secondary and Postsecondary education is linked in a variety of ways, including the following:

- Maryland's State Partnership Team for Project Lead The Way (PLTW), a pre-engineering program for high school students, is in the process of developing a common articulation agreement among Maryland's two- and four-year institutions;
- The Maryland State Department of Education with its PLTW Affiliate, the University of Maryland, Baltimore County continue to college certify PLTW programs, which allows to get transcribed and/or articulated credit at a number of postsecondary colleges and universities throughout the country. In the 2004-2005 school-year, eight schools received college certification.

- Tech Prep consortia agreements ensure that all activities span Secondary and Postsecondary levels;
- A program development process has been instituted that requires all programs to include course sequences that include Secondary and Postsecondary courses;
- Many school systems and community colleges have joint advisory committees; and
- Both Secondary and Postsecondary partners have been involved in the development of the CTE portion of Maryland's Unified Plan.

M. Addressing Equity

Maryland is committed to providing continued technical support to promote equity in career and technology education. MSDE provides local school systems and community colleges a list of programs by CIP numbers that are non-traditional by gender. This enables the school systems and community colleges to identify non-traditional programs in their consortia and develop strategies to promote these programs. Students at both educational levels are assisted by Vocational Support Services to help them meet the core indicators of performance.

N. Developing the Memorandum of Understanding

Maryland has developed a Memorandum of Understanding in concert with WIA partners for each local WIB and one-stop partners.

O. Coordination of Non-duplication Among Programs

Under the leadership of the Governor's Workforce Investment Board, Maryland continues to work on non-duplication among workforce development programs.

P. Special Populations

Program Strategies for Special Populations

As CTE programs are updated and as new programs are designed, local school systems and community colleges are required to identify how they will meet the needs of members of special populations. Maryland has successfully used the Vocational Support Service Team approach, which provides both direct and indirect services to special populations enrolled in CTE programs.

Non-traditional funds have been targeted to statewide improvements in Automotive and Construction careers to increase the numbers of female program participants and completers.

Technology has played a major role in meeting the needs of special populations. Through the use of technology, all students have access to a variety of strategies, which improve their opportunities to learn and grow. Students may gather and absorb information at their own pace. An example of how technology can assist special populations is Career Net. Not only can special population's students utilize Career Net due to its accessibility over the Internet, but also

counselors, educators and others who work with special populations have access to it for resource purposes.

Another example of how Maryland has provided for special populations is the Tech Prep application. The Tech Prep application requires equal access to programming for special populations.

Special Populations and Performance Levels

Each local plan addresses how members of special populations will be served. Included in this plan are vocational support services for members of special populations. Tech Prep also addresses special populations and a description of how members of special populations will be served is a required element in all Tech Prep consortia agreements.

Students in Alternative Programs

Maryland had contributed to the state unified plan under the Governor's Workforce Investment Board to address the needs of at-risk students and adults.

Non-Traditional Employment and Training

Non-traditional employment and training are a priority for Maryland. First, Maryland measures non-traditional enrollment and completion at both the secondary and postsecondary levels. By measuring these indicators of performance, local school systems and community colleges make these indicators a priority as well. This, along with the collaboration with other government agencies, indicates that Maryland is working to integrate non-traditional employment and training in all aspects of CTE program development.

Q. Individuals in State Correctional Institutions

In all three regions, vocational instructors have actively developed linkages and articulations with private business and industry. In both the Eastern and Central regions, such articulations have recently provided valuable material and equipment donations for instruction.

In the Western region, vocational educators have enjoyed the benefits of private industry's support of our correctional programs. These articulations have netted material gain such as; raw construction materials, autos from the major auto manufacturers for diagnostic instruction, and cut-away demonstration models for theory instruction. Beyond the material gain is the invaluable input these companies can share with our instructors for curriculum updating.

The important activity of formally establishing advisory/craft committees is ongoing and meetings have been planned for the Occupational Skills Training Center for the Greater Baltimore Businesses. We are hopeful that these meetings will continue to translate into committed advisory committees for all correctional education programs.

Statewide fiscal vocational priorities were established. Institutional and regional priorities were gathered and method of distribution provides not only accountability but also front-end decision making for representatives from each region.

Professional development improved significantly this year due to the National Center for Construction Education and Research (NCCER). Eight instructors were provided the opportunity to attend training that certified them to teach using the NCCER curriculum. These programs in construction trades greatly enhanced the students' abilities and skills for better job placement. The students can now receive a national recognized certification.

Computers purchased in past years have shown sufficient impact on program delivery. Program instructors continued to enhance their curriculum by purchasing additional computers and software programs. In FY'05, additional computers and other hardware were purchased to improve technology enhancement to the business programs introducing Windows 2000 and XP and Professional Office 2003.

The Occupational Skills Training Center continues to be a major project to facilitate the transition of incarcerated persons (male and female) from economic dependence to economic independence. A critical need is preparation for civilian employment and support in the transition into the civilian labor market at the point of release. Job development and placement is also an integral part of the ongoing training process at the center (*see initiative below*). Also to enhance the skill training programs, a computerized related math and reading job skills program (Skills Compass) was installed as a network for use by all students assigned to the center and a life skills program that covers Wellness, Communication and Employability Skills Training. Both enhancement programs were integrated into each student's schedule to give every OSTC student the opportunity to complete a total integrated training program.

Employment Assessment and Post-Incarceration Job Placement

Initiative: Continue to expand the systematic job readiness/job placement program which interfaces with current on-site occupational training and enhances current life skills, education, training, counseling, and pre-release planning with structural services to enhance and accelerate individualized reintegration into the community. These services act as a transitioning agent to assist inmates in securing employment prior to or immediately after release, to maintain employment, provide post-placement follow-up and client tracking.

R. Tech Prep

Tech Prep Program and Articulation Agreements

Tech Prep funds have been awarded on a competitive basis to local consortia consisting of local school systems and eligible postsecondary partners in the consortium. Funds support Tech Prep programs carried out under both consortium and articulation agreements. Additional incentive funds have been awarded to consortia to support the development of new Tech Prep programs to address economic and workforce development needs including pre-engineering, information technology, nursing, automotive technology, law enforcement and manufacturing.

Tech Prep incentive grant funds also supported the enhancement and development of High Schools That Work (HSTW) sites and professional development opportunities for career and technology education teachers; guidance counselors and post-secondary faculty. In partnership with the University System of Maryland, a statewide articulation agreement is being developed for students who complete the Project Lead the Way pre-engineering program. Maryland will continue to support the review and update of articulation agreements and to expand the number of Tech Prep programs linked with four-year degree programs.

In FY05, Maryland continued its support of PLTW with over \$605,000 in Tech Prep funds. This money supported new and ongoing development of 27 PLTW schools in 12 school systems.

Two Years at the Secondary Level and Two or More of Higher Education or Apprenticeship

Maryland required that each funded Tech Prep program consist of at least two years of secondary school preceding graduation and two years or more of higher education, or a two-year apprenticeship program. Proposed Tech Prep programs were evaluated through Maryland's program approval process to ensure secondary instruction includes a common core of required proficiencies in math, science, written communications and technology designed to lead to an associate degree or a postsecondary certificate in a specific career field. Technical assistance will continue to be provided to local consortia on the program proposal process, the evaluation of Tech Prep programs and the development of local Tech Prep plans, which strengthen student academic and technical preparedness.

Meeting Academic Standards and Ensuring Non-duplicative Sequences of Courses

In order to prepare students for Maryland's High School Assessment program, new and revised Tech Prep programs incorporated the High School Core Learning Goals, including the Skills for Success, into curriculum and instruction. Secondary and postsecondary stakeholders collaborated in the development of non-duplicative course sequences to ensure the smooth transition from secondary to postsecondary education. The program proposal process continues to emphasize collaboration among stakeholders to ensure non-duplicative course sequences and facilitate a seamless transition between educational institutions.

Professional Development for Teachers

Professional development for teachers focused on: upgrading teachers' skills and knowledge of engineering concepts to be taught in PLTW; integrating mathematics and reading strategies into technical curricula; the use of blended instruction to ensure student mastery of challenging academic and technical standards within a specified career area; implementation of the Maryland Career Development Model and National Occupational Information Coordinating Council competencies; the use of technology for career and technology education administrators, teachers, and counselors; and technical assistance to create plans promoting higher levels of student attainment.

In committing to implement PLTW, schools agreed to have PLTW teachers trained to deliver the PLTW curriculum. In FY 2005, Maryland hosted on-going training for the 31 PLTW teachers that had been trained in July 2004. During the summer of 2004, 31 teachers received over 75 hours of training on the Principles of Engineering, Introduction to Engineering Design, Digital Electronics, Computer Integrated Manufacturing, Civil Engineering and Architecture, and/or Engineering Design and Development curriculum. In conjunction, faculty members from the Engineering Department at the University of Maryland, Baltimore County (UMBC) as well as faculty from the community colleges' engineering departments were also trained in order to offer continuing professional development on the PLTW curriculum within the state.

Professional Development for Counselors

Professional development was designed to provide counselors with resources to inform students about Tech Prep programs. Teams representing secondary and postsecondary counselors, administrators and teachers attended a statewide career development conference focusing on ways to systemically integrate the Maryland Career Development Model. Project Lead the Way has designed a counselor's conference that assists counselors in guiding students toward educational and career opportunities in engineering. In FY 2005, Maryland hosted a conference and invited a maximum of four guidance counselors from each PLTW high school and/or feeder middle school site to attend. Thirty-eight counselors participated in sessions that addressed issues pertinent to secondary and postsecondary engineering education. As a result of attending the conference, they were able to apply for credit from the National Board for Certified Counselors.

Equal Access for Special Populations

Maryland requires local Tech Prep consortia to provide equal access to individuals who are members of special populations to cover fairness in admission practices, adaptations necessary to ensure that students succeed in their CTE programs, and support services for members of special populations. Local plans and progress reports are monitored to ensure equal access to individuals who are members of special populations.

Providing Preparatory Services in Tech Prep

Local consortia worked to enhance curriculum in career and technology education to prepare students for postsecondary education and decrease student remediation rates in reading, writing and mathematics. The state provided professional development for personnel from local consortia in the implementation of the Maryland Career Cluster Frameworks and pathways, Maryland's Career Development Model and on the recruitment, retention and tracking of students enrolled in Tech Prep programs. Efforts continue to support the development and implementation of local marketing efforts of Tech Prep programs, appropriate career development activities, and data collection.

WIA State Incentive Grant

Funds were provided to form a consortium to develop a Biomedical Program under the direction of Project Lead The Way in cooperation with the following states: Missouri, South Carolina, and Indiana. The mission of the initiative is to create dynamic partnerships within the nation's schools to prepare an increasing and more diverse group of students to become more successful in the study of Biomedical and Life Sciences at the post-secondary level and to move into careers. The goals are to improve the quality of programs, increase the number of programs to ensure student access, and increase the number of students graduating prepared to enter careers in the biomedical field. During the first year of the grant, the project achieved completion of two kernels of study and the development of a third that meet the agreed-upon standards. The first course, Principles of Medical Science, is under development and will be piloted by the curriculum writers upon its completion. Writing teams were convened in Baltimore and Albany, New York to develop the first course. The draft kernels were written, edited and prototyped by teachers in cooperation with representatives from higher education and the business community. A rigor filtering team was convened to evaluate the work. Research was conducted to identify content standards and resources essential to the curriculum writing process.

II. PROGRAM PERFORMANCE

A. State Performance Summary

The following provides a description of Maryland's performance results as compared to negotiated performance levels for program year 2004-2005. All performance data is reported for program participants during 2004-2005 except as noted:

1S1 - Secondary Academic Achievement (Exceeded Performance Level)

The performance of secondary CTE concentrators for the academic skill attainment sub-indicator exceeded the negotiated performance level by 2% for the program year. Performance gaps between gender, racial and special population groups exist for this measure and are addressed in current year strategies below. However, performance gaps have been eliminated for limited English proficient and nontraditional enrollees.

1S2 - Secondary Technical Achievement (Exceeded Performance Level)

The percentage of CTE concentrators meeting the technical achievement standard exceed the negotiated level by more than 4% for the program year. As above, there are performance gaps for some sub-populations, however, such gaps have been eliminated for nontraditional enrollees for this measure. Remaining performance gaps are addressed in current year strategies below.

2S1 - Secondary Completion (Did Not Meet Performance Level)

Secondary CTE concentrators graduate from high school at high rates (92.2%), however, they did not meet the performance standard. None of the subgroups met the performance level for this measure. The determination of a graduate and the data collection process have been

modified by the state of Maryland and may have contributed to the overall decline in students reported as high school graduates in comparison to previous years. Strategies to address this performance measure are listed below, including alignment to new reporting procedures.

3S1 - Secondary Placement **(Did Not Meet Performance Level)**

The percentage of CTE completers who can be shown to have entered postsecondary education, employment, or the military two quarters after high school completion increased by 6% for the current program year, however, fell slightly below the target (0.26%). Placement in postsecondary education showed an increase of 1%, while employment showed an increase of more than 8%. Strategies to address this performance measure are listed below.

4S1 - Secondary Non-Traditional Enrollment **(Did Not Meet Performance Level)**

The percentage of under-represented individuals enrolled in secondary non-traditional programs had a slight decline (0.22%) following three years of increased enrollment. Strategies to address this performance measure are listed below.

4S2 - Secondary Non-Traditional Completion **(Exceeded Performance Level)**

Overall performance showed an increase for the year, exceeding the performance level. Performance for all subgroups by gender, race and special populations also exceed negotiated levels, with the exception of students with disabilities and American Indian, with less than one percentage point gap in performance.

1P1 & 1P2 - Postsecondary Academic and Technical Achievement **(Exceeded Performance Level)**

Performance continues at a very high level (98.39%). Subgroup performance exceeds negotiated level for all genders, races and special populations.

2P1 - Postsecondary Completion **(Did Not Meet Performance Level)**

Reported performance showed a slight decline (0.53%) from the previous year, however, improvements to the data collection methodology has allowed for measures approaching comparability with those used to establish the original baseline measure. Strategies to address this performance measure are listed below.

3P1 - Postsecondary Placement **(Exceeded Performance Level)**

Placement for post-secondary CTE program showed a 4% increase during the current program year and remained substantially above the negotiated level. Progress has been made for subpopulation groups with all subpopulations exceeding the performance level.

3P2 - Postsecondary Retention **(Exceeded Performance Level)**

Retention in employment of post-secondary CTE completers who entered employment two quarters after completion showed more than a 4% increase. This performance exceeds the negotiated performance level for all subgroups, with the exception of students with disabilities.

4P1 - Postsecondary Enrollment (**Did Not Meet Performance Level**)

Enrollment of under-represented individuals in non-traditional programs declined slightly (0.59%) during the current program year causing Maryland to miss the performance target. Strategies to address this performance measure are listed below.

4P2 - Postsecondary Completion (**Exceeded Performance Level**)

Completion of non-traditional programs by under-represented students at the post-secondary level continues to exceed the negotiated performance target. There continue to be more underrepresented males completing these programs than females.

B. Define Vocational Concentrator and Tech Prep Students

Definitions remain the same as the previous program year:

- Concentrator students are any student enrolling in a course at the Concentrator level for a CTE completer program. Concentrator courses were identified for every CTE program sequence in every local school system in Maryland; and
- Tech Prep students are all students that are concentrators in a Tech Prep program. Tech Prep is a combined secondary and postsecondary program that leads to an associate's degree, two-year certificate, or completion of a two-year apprenticeship program.

Measurement Approaches and Data Quality Improvement

Measurement approaches for all sub-indicators remains the same as in the previous program year, and are accurately reflected in the electronic and paper reports published by OVAE.

Data quality improvements for the current program year were based primarily on a joint effort with the Maryland Higher Education Commission (MHEC) to more accurately capture data for Perkins eligible programs. Working with MHEC, MSDE utilized the state approved Academic Program Inventory to construct a new Occupational Program Inventory that allows for more accurate extraction of Perkins enrollment and performance measures..

C. Effectiveness of Improvement Strategies in Previous Year

The following provides a brief summary of state level improvement strategies by sub-indicator for program year 2004-2005 and an assessment of their effectiveness:

1S1 - Secondary Academic Achievement

While Maryland continues to exceed negotiated levels of performance, the effectiveness of strategies to increase academic skill attainment will be reviewed as a part of analyzing the drop

in overall grade point averages reported for this program year. Achievement gaps by race and other subpopulations persist and will continue to be addressed, most directly through alignment of academic standards to CTE programs.

1S2 - Secondary Technical Achievement

Leadership will continue to focus on aligning state level resources to our framework for improving CTE program quality. The state has continued to identify high quality CTE programs (CTE Pathway Programs) and has expanded efforts by adding seven (7) new “model” programs. All new CTE Pathway Programs include alignment to industry standards and “value-added” options for students through industry certification.

2S1 - Secondary Completion

MSDE will continue to integrate and align CTE program improvement activities with the broader state level high school reform programs, such as *High Schools That Work* and Smaller Learning Communities, to ensure higher levels of high school graduation for CTE concentrators.

3S1 - Secondary Placement

Implementation of the Maryland Career Development Model and Career Cluster Frameworks continues to be an effective means of providing students with transparent information about the demands of further education and the contemporary job market. Continued development of Tech Prep programs and state-wide articulation agreements has also strengthened student transition to college and careers.

4S1 - Secondary Non-Traditional Enrollment

State-wide efforts have continued to produce high levels of under-represented student enrollment in non-traditional programs. Early efforts of the demonstration grants in automotive and construction clusters have been expanded to programs in Pre-Engineering and Printing Technologies.

4S2 - Secondary Non-Traditional Completion

Major strategies for non-traditional completion are being deployed through demonstration projects that were in their initial year of implementation making it difficult to assess effectiveness. While expanding efforts, we would not expect to see impacts on program completion for two to three years from initiation.

1P1 & 1P2 - Postsecondary Academic and Technical Achievement

Post secondary institution’s use of improved instructional and assessment strategies have continued to provide significant improvements in both academic and technical performance.

2P1 - Postsecondary Completion

Post-secondary recipients are continuing efforts to have students achieve program completion prior to transfer and/or placement in employment. These efforts have included review of program offerings to provide more customized degrees and certificates, and transcript analysis to determine student eligibility for program completion.

3P1 - Postsecondary Placement

Implementation of the Maryland Career Development Model and Career Cluster Frameworks continues to be an effective means of providing students with transparent information about the demands of further education and the contemporary job market.

3P2 - Postsecondary Retention

Implementation of the Maryland Career Development Model and Career Cluster Frameworks continues to be an effective means of providing students with transparent information about the demands of further education and the contemporary job market.

4P1 - Postsecondary Enrollment

State-wide efforts have continued to produce high levels of under-represented student enrollment in non-traditional programs. Targeted efforts in automotive and construction clusters have been expanded to Pre-Engineering and Printing Technologies.

4P2 - Postsecondary Completion

Focus on program completion for underrepresented students in non-traditional programs by way of the initiation of demonstration projects appears to have raised awareness of this issue. Performance during the plan year shows significant improvements.

D. Improvement Strategies for Next Year

The following provides a brief summary of state level improvement strategies by subindicator planned for program year 2005-2006 (Note: numbering refers to FY03 Deployment Strategies from DCTAL Strategic Plan for CTE FY 2003-2006):

1S1 - Secondary Academic Achievement

- 1.1.1.1 Develop an utilize performance data for CTE program improvement
- 1.1.1.2 Create success strategies for special needs students
- 1.2.1.1 Align Perkins Core Indicators of Performance with School System Master Plans

1S2 - Secondary Technical Achievement

- 1.2.1.2 Require all new CTE programs to align to state standards as outlined in the 2001 CTE Program Proposal Framework

- 1.2.13 Identify lowest 20% of CTE Programs for revision using 2001 CTE Program Framework
 - 1.2.2.4 Provide leadership and support to Tech Prep Consortia in designing quality secondary and postsecondary CTE programs
 - 2.1.1.1 Implement CTE cluster frameworks
 - 2.1.1.2 Curricular alignment of CTSOs
- 2S1 - Secondary Completion
- 1.2.1.4 Provide leadership to LSS Guidance Supervisors on implementation of MD's Career Development Standards.
- 3S1 - Secondary Placement
- 2.1.1.3 Align Career Development Model with CTE cluster frameworks and integrate academic measures aligned with new state curriculum
- 4S1 - Secondary Non-Traditional Enrollment
- 1.1.1.3 Implement non-traditional demonstration grants
- 4S2 - Secondary Non-Traditional Completion
- 1.1.1.3 Implement non-traditional demonstration grants
- 1P1 & 1P2 - Postsecondary Academic and Technical Achievement
- 1.2.1.4 Align Tech Prep resources to increase academic and technical rigor of CTE Programs
 - 4.1.1.1 Refocus Tech Prep to support the use of career focused educational solutions
- 2P1 & 3P1 - Postsecondary Completion and Postsecondary Placement
- 1.2.14 Provide leadership to local school system guidance supervisors on Maryland Career Development Model
 - 2.1.1.3 Align Career Development Model with CTE cluster frameworks and integrate academic measures aligned with new state curriculum
- 3P2 - Postsecondary Retention
- 1.2.14 Provide leadership to local school system guidance supervisors on Maryland Career Development Model
 - 2.1.1.3 Align Career Development Model with CTE cluster frameworks and integrate academic measures aligned with new state curriculum
- 4P1 - Postsecondary Enrollment
- 1.1.1.3 Implement non-traditional demonstration grants
- 4P2 - Postsecondary Completion
- 1.1.1.3 Implement non-traditional demonstration grants