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# **Career and Technical Education In Pennsylvania**

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## **Opportunities for Commonwealth Policy**



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**JOBS FOR THE FUTURE**

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## *Opportunities for Commonwealth Policy*

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# **Career and Technical Education in Pennsylvania *Opportunities for Commonwealth Policy***

## **Introduction**

Career and technical education in Pennsylvania faces a dual challenge. CTE programs must prepare students for careers in the 21<sup>st</sup> century and the new knowledge economy. Simultaneously, CTE must meet or exceed academic expectations and standards required of all students. This report summarizes the findings and recommendations of Jobs for the Future regarding secondary career and technical education in Pennsylvania. After describing our methodology, we briefly characterize Pennsylvania career and technical education system and then highlight major policy trends in other states that are grappling with how to improve the outcomes of their secondary CTE systems. We focus on recommendations for the Commonwealth to adopt to improve the quality of secondary career and technical education and strengthen its role in supporting academic and technical achievement.

High-quality career and technical education should be an option available to help all young people adequately prepare for the 21<sup>st</sup> century economy. However, significant changes are required if the Pennsylvania CTE system is to be a first-class system available and attractive to all students, rather than continue its emphasis on serving proportionately more students who are academically under-prepared and less likely to pursue postsecondary education.

JFF's recommendations to improve the Commonwealth's CTE system are far-reaching and will require significant changes in state and district policy if structural reforms are to be sustainable over the long term. To implement these changes successfully will require strong gubernatorial leadership and a combination of legislative action, executive orders, and changes in departmental policies and local practices. Although JFF's team did not conduct an extensive review of all the relevant laws, codes, and regulations related to CTE and Pennsylvania's education reform efforts, our research positioned us to propose that the Commonwealth consider several legislative and gubernatorial actions as part of its political deliberations, as well as activities within the purview of the State Board of Education, the Pennsylvania Department of Education, local districts, and area career and technical education schools. The chart summarizing our recommendations notes which institutions and authorities will need to take steps to implement each recommendation.

## **Methodology**

In an environment of standards-based reform, changing economic conditions, and increasing pressure on K-12 education to ensure that all students are prepared for postsecondary education and careers, an examination of the role of secondary career and technical education is appropriate. It is a vastly diverse and complex enterprise: about 45 percent of high school students take three or more vocational courses while in school, and many more take at least one career and technical course. About 25 percent of students nationwide can be considered vocational concentrators. Serving for many decades as the high school track for the non-college-bound, career and technical programs and vocational schools are now expected to produce students with the technical and academic skills to continue on in either college or career. In Pennsylvania

today, as in most states, career and technical education is at an important juncture: under siege from some as not academically strong or economically relevant enough, and recognized by others as an important secondary route to accomplishment and success in education, careers, and effective citizenship, career and technical education cannot stand still or it will fail to meet rising expectations of its quality.

The Office of the Governor and the Pennsylvania Department of Education retained Jobs for the Future to develop options and recommendations for state-level action to improve secondary career and technical education. Our task was to assess, in a short time frame, the general state of career and technical education in the Commonwealth with an eye to interventions Pennsylvania can make to help improve program quality and performance. Our data collection effort drew from the following sources:

- A review of literature and national policy context;
- Site visits and interviews with state officials and CTE association leadership; and
- Interviews with Pennsylvania educators, employers, and policymakers.

JFF captured perspectives from a wide range of sources to ensure that we set our analyses and recommendations in the context of overall education reform and economic and workforce development trends. We examined national perspectives on trends in career and technical education, drawing from the recently released National Assessment of Vocational Education and from the debate surrounding reauthorization of the Carl Perkins Vocational and Technical Education Act. Publications of the American Youth Policy Forum and the Southern Regional Education Board were particularly helpful: these organizations have a longstanding interest in secondary education and the role of career and technical education. Also highly useful were resources from numerous other sources. We consulted with association leaders and education reform experts nationally and in selected states to gain their perspectives on state interventions and reform efforts. These discussions focused on state-level influence and policy rather than on school or district-level practices. Because of their importance as context for Pennsylvania's effort, we have highlighted the results of those state discussions.

JFF also carefully examined career and technical education policy and practice in the Commonwealth. We interviewed senior officials across the education system, in schools and district offices, at the state level, and in education associations. We supplemented our secondary education perspective with views of other key stakeholders in secondary CTE: employers, state officials, and postsecondary education providers. We reviewed pertinent documentation about CTE in Pennsylvania, including program data collected by PDE and the 2001 report of the Keystone Commission chaired by Representative Jess M. Stairs (R-Westmoreland County) and co-chaired by Rep. Nicholas A. Colafella (D-Beaver County). The recommendations of the Commission, which was established to study ways to better prepare students for the workforce and to retain skilled graduates, should be revisited and implemented where appropriate.

Our team visited seven regional CTE centers, several of which comprise multiple campuses. Visits to these sites, which varied by geography, program type, size, demographics, and other characteristics, provided an invaluable opportunity for an on-the-ground view of both the strengths of the Commonwealth's CTE schools and the

serious challenges facing contemporary CTE in its diverse manifestations across the state.

Our goal was to determine, in the highly decentralized enterprise that is the U.S. education system, how state policy and targeted investment can drive and support significant reform and improvement of CTE in the Commonwealth. Through our research and analysis of the data we collected, we identified common concerns, program areas requiring attention and strengthening, and guidance for state leaders on strategies to promote reform. The recommendations in this report, as guiding principles for reform, should serve as the foundation for detailed planning and implementation at the state level and with participants and stakeholders in CTE across the Commonwealth.

The recommendations are summarized in the following chart. The chart is designed to highlight the most important recommendations for action, It is also designed to be a tool for use by state officials and policymakers. The columns identify potential leaders and partners for implementation of each recommendation: filling them in can be a helpful exercise in thinking through the implementation strategy for particular recommended actions.

## Career and Technical Education in Pennsylvania Opportunities For Commonwealth Policy

### Summary of Recommendations

RECOMMENDATION	Lead and Responsible Parties						
	General Assembly	Governor	State Board of Education	PDE	District	ACTES/ High schools	Association and other
<b>Academic Rigor</b>							
<b><i>Insist on higher academic standards for all CTE programs, regardless of career field, economic conditions, or demographic characteristics.</i></b>							
Hold CTE programs to the same academic standards as other high school programs, through legislative or regulatory mechanisms.							
Eliminate the general, or vocational, track in practice, through legislative or regulatory action							
Ensure adequate remediation and academic support for students who enter CTE programs below grade level in core academic subjects							
Review the content of CTE curricula to ensure that underlying academic content is captured and taught							
Expand professional development opportunities for teachers and administrators to build academic standards into CTE curricula and to help academic teachers build technical competencies into their teaching pedagogy							
Identify and implement other methods of integrating reading, writing, and mathematics across technical fields							
Amend the Commonwealth's Vocational Education law and codes to require that CTE programs are aligned with and integrate the state's academic standards							
Revise, enact, and implement Career Education and Work Standards, providing specificity and guidance similar to the process used to implement Pennsylvania's academic standards							
Ensure that CTE students are integrated with other students in their home high schools and provided with the same academic program choices, particularly in programs where CTE students rotate in and out on a less than daily basis							
Eliminate academic subjects offered for vocational concentrators as a separate cohort, except as absolutely necessary and educationally advisable							
Improve collection, analysis and use of data to focus attention on academic performance for all students							
Seek means to share accountability with local sending schools so that incentives will encourage efforts to improve performance of all students							

RECOMMENDATION	Lead and Responsible Parties						
	General Assembly	Governor	State Board of Education	PDE	District	ACTES/ High schools	Association and other
Develop and promote strategies that strengthen CTE's academic underpinnings, identify promising practices among its members and provide opportunities to share those practices across Pennsylvania							
<b>Take steps to further integrate CTE, regardless of program model, with broader secondary school reform efforts.</b>							
Ensure that state and district-level high school reform efforts include a CTE component							
Merge Pennsylvania's Project 720, High Schools That Work, and CTE initiatives into one high school reform effort							
Consider adoption of a career pathways or cluster framework to help structure individual educational planning and awareness							
Require that CTE leaders actively participate in sending districts' decisions about student referrals to CTE programs							
<b>Industry Relevance</b>							
<b>Expect CTE programs to adopt nationally recognized industry standards or, in their absence, a recognized measure of quality, to demonstrate relevance of programs to the demands of the 21<sup>st</sup> century economy.</b>							
Apply industry standards to all CTE programs as appropriate							
Conduct analysis and approval at the state level of industry certification options and applicability							
Invest in teacher development to assist teachers in accessing appropriate technical training							
Consider legislation to require career and technical education programs to reflect current best-practice and industry accepted standards							
Counsel students in programs that fall short of industry standards to seek alternatives							
Work with the NOCTI to broaden the competencies measured in the assessments to reflect academic performance as well as technical job skills							
<b>To ensure that Pennsylvania's workforce is well-suited to demands of the new economy, tie CTE programs closely to business and industry needs and to labor market trends.</b>							
Eliminate programs that have become out of date and lack enrollment or external demand							
Use the career pathway framework for relating CTE programs to Commonwealth human capital and economic priorities							
Identify the elements of strong industry advisory board practice and disseminate statewide							
Improve use of local, regional and state labor market data to guide program decisions and resource allocation							
<b>Postsecondary Transition</b>							
<b>Strengthen CTE programs significantly, and provide opportunities for youth and adults across the Commonwealth, by strengthening links to postsecondary education and reducing turf barriers between education sectors.</b>							



RECOMMENDATION	Lead and Responsible Parties						
	General Assembly	Governor	State Board of Education	PDE	District	ACTES/ High schools	Association and other
Consider legislation and regulatory language that provides strong incentives for articulation between CTE programs and the state's postsecondary systems (both two-year and four-year)							
Adopt a more standardized state process for developing and implementing articulation agreements							
Implement other means of strengthening secondary-postsecondary links such as faculty sharing or facility sharing							
Identify incentives for institutions to create dual enrollment options for CTE students							
Expand and encourage the ability of regional career and technology centers to seek postsecondary accreditation							
Provide ACTESs that deliver high quality programs with the ability to grant college credit for approved programs and provide incentives for them to do so							
Support PDE's role as accreditor of programs granting postsecondary credit							
<b>State Leadership and Capacity</b>							
<b><i>At the gubernatorial level, craft a simple, clear, consistent message and agenda regarding the role of quality secondary career and technical education in meeting Pennsylvania's education and workforce needs.</i></b>							
Provide strong message from the gubernatorial level about CTE's role in high school education and in preparing the Pennsylvania workforce of the 21 <sup>st</sup> century							
Provide stronger state leadership for policy direction that CTE must be rigorous, preparing students for PSSA success and industry certification; and that CTE must be part of the range of quality options for future success available to high school students							
Use state role to highlight quality criteria and also provide examples of exemplary programs							
<b><i>To achieve the dual objectives of strong academic underpinnings and industry relevance, realign resources to invest in teaching capacity and system support.</i></b>							
Provide more coordinated, consistent professional development for technical and academic instructors in CTE programs							
Consider raising the certification requirements for CTE teachers who enter teaching directly from industry							
Clarify, where possible, confusion about CTE funding and shift focus to improving policy and quality of existing programs							
Examine options for allowing funding for special education to follow the student to CTE programs							
Share information about effective practice in renegotiating articles of agreement among sending districts							
Revisit the existing CTE funding formula and consider whether CTE funding should be increased by small reduction in state							

RECOMMENDATION	Lead and Responsible Parties						
	General Assembly	Governor	State Board of Education	PDE	District	ACTES/ High schools	Association and other
base subsidy to districts							
Expand the Innovative Learning Grants program or create new innovation grant funding mechanism for competitive grants with significant local match and quality criteria							
<b><i>Charge the Pennsylvania Department of Education to take a much stronger leadership role and an increased role in quality control and program review.</i></b>							
Institute a strong process for program approval, self-study, and oversight, with a focus on program improvement and the sharing of effective practices, and with regulatory updating if needed							
Build corrective action plan, a timeline for improvement, and eventual elimination of programs if performance is not improved into program review and approval process							
Encourage secondary education institutions to use tested self-assessment processes to guide change and improvement.							

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## **The Pennsylvania Career and Technical Education System**

Pennsylvania's secondary CTE system is a significant component of high school education in the Commonwealth. In 2001, the Commonwealth of Pennsylvania allocated \$67 million for K-12 Career and Technical Education, about 1.1 percent of the \$6.27 billion the state allocated that year for all K-12 spending (Klein et al. 2002). This percentage measure of investment puts Pennsylvania in the lower half of states, fairly similar to New York and Kansas, but behind Kentucky (6 percent) or Delaware (5.4 percent).

This section of the report provides a snapshot of Pennsylvania's secondary CTE system in terms of students served, institutional delivery system, programs offered, and outcomes for students in CTE programs.

### **Who are the secondary CTE students?**

The CTE enterprise in Pennsylvania touches the lives and structures the high school experience of a large number of young people. Enrollment in CTE programs exceeds 25 percent in some jurisdictions, particularly in grades 10-12.<sup>1</sup> Secondary career and technical education in Pennsylvania is provided primarily through 81 area career and technical education schools (ACTESs) and slightly more than 300 local high schools.<sup>2</sup> In the 2002-03 school year, over 93,000 high school students were enrolled in approved secondary CTE programs across Pennsylvania: a total of 53,854 students were enrolled in ACTES programs, and 32,328 students participated in career and technical education offerings at district high schools.

The number of students served in ACTES programs has been increasing in recent years. ACTES enrollments rose 3.6 percent from 1998-99 to 2002-03. However, this increase has been slower than the 6.8 percent rise in total public school enrollments in grades 9-12. Moreover, the significant absolute decline in district high school CTE enrollment since 1998-99 (almost 4,000 students, or 8.8 percent) has resulted in a 2,000 student decrease (roughly 2 percent) in total career and technical programs enrollments between 1998-99 and 2002-03 (PDE 2004).

Most students enrolled in CTE in Pennsylvania are in grades 10-12. About 20 percent of all public high school students in Pennsylvania are CTE students across grades 10-12, with the percentage reaching 22 percent of twelfth graders in 2002-03. Enrollments in each of grades 10-12 tend to be about three times as large as the ninth grade enrollments. Most ninth grade enrollments (57 percent) are in district high school programs rather than the ACTES programs, while most enrollments in grade 10-12 are at ACTES programs (59 percent).

Minorities accounted for 20.5 percent of all public school enrollments in the Commonwealth in 2002-03 and 22.4 percent of enrollments in approved CTE programs. Black students comprise about 16 percent of total enrollments. There is an important difference between high school and ACTES enrollments by race and ethnicity. Almost 85 percent of ACTES students are white, compared to only 67 percent in district high school programs. Black enrollments comprise 25 percent of all high school CTE enrollments compared to only 9 percent of ACTES enrollments (PDE 2004).

ACTES programs tend to enroll greater numbers of disabled students than do their sending high schools. For the years 2002-2003, about 26 percent of ACTES students had some physical/mental impairment that limits a person in some major life activity or employment (Burket 2004). This compares to closer to 10 percent of high school enrollments across the state. It appears that disabled and special populations are overrepresented in ACTES programs compared to the relevant sending high schools. However, the data available at the state level are difficult to assess. One analysis of the data for 2003-04 enrollments found that the percentage of special needs students with Individual Education Plans at some ACTES schools was comparable to that in the sending districts, while at other ACTES schools, three times as many students had IEPs as at the sending districts in the region. In some ACTESs, more than 40 percent of students are classified as special needs students who must have an IEP. As in many aspects of CTE experience in Pennsylvania, the variation from region to region and school to school, even program to program, makes statewide generalization difficult.

That said, on the whole, special populations students appear to be overrepresented in ACTES programs. In 2002-03, 51.5 percent of students in ACTES and local high school CTE programs were identified as special populations, which includes disabled students and also educationally disadvantaged, economically disadvantaged, and limited English proficient students, as well as students in a few other smaller categories. The educationally disadvantaged group was the most frequently identified as a percentage of statewide enrollments, at 23.4 percent (PDE 2004).

### **Where are students served?**

Pennsylvania's secondary education system, including area CTE programs, is extremely diverse, with significant local variance and emphasis. Therefore, it is difficult and potentially dangerous to generalize about the typical CTE student or educational experience. Career and technical education is provided in a variety of settings and levels, including middle school career exploration, secondary programs, postsecondary programs, and customized adult workplace programs.

We have noted the split in CTE offerings between district high schools and area vocational schools (as well as significant variations in high school and area school enrollment patterns). This is not the only variation in institutional structure for delivery of CTE programs. The range of service delivery models includes a variety of part-time configurations, full-time comprehensive technical high schools, senior-year-focused programs, grades 10-12 programs with special support for younger students, and dual enrollment options. This range of service delivery presents particular challenges as the system and its individual institutions try to raise academic performance, increase postsecondary enrollment, and strengthen industry credentialing processes. Of the 81 area vocational schools, 15 are comprehensive high schools, and 66 are exclusively occupational. A small number of schools provide programs on a rotating schedule instead of part-time, which may create significant issues for integration of CTE students into their home school environments: schools with more comprehensive approaches may have been able to make the most significant changes in student performance.

### **What programs are offered?**

The number of approved CTE programs in Pennsylvania schools is large. A total of 1,385 approved programs were offered in the 81 ACTESs in 2002-03 and another 1,064

at the 302 high schools. The total has been growing slightly in recent years: 1,631 approved programs were offered at area schools in 2003-04.<sup>3</sup> Overall, the largest number of programs offered is in trade and industry (1,178 in 2002-03) and fewest in marketing and distributive education (74). At district high schools, business education is by far the most frequently offered program (about 45 percent). At the ACTESs, trade and industry programs predominate (about two-thirds of all offerings). In 2002-03, the federal career cluster categories that represented the greatest concentrations of enrollment at ACTES schools were: hospitality and tourism (17.9 percent), architecture and construction (16.2 percent), transportation distribution and logistics (15.1 percent), and manufacturing (14.6 percent). At local district high schools, the largest concentrations were in business and administration (37.6 percent) and agriculture and natural resources (14.5 percent). Some people we interviewed in the CTE community felt, as one person said, that “high schools should not be offering programs in CTE; we should be using the CTE centers and aligning the curriculum with the schools.” The fact remains that CTE will continue to be offered in a range of settings and configurations. The challenge for policymakers and practitioners is to raise quality across the board, regardless of locale—and to ensure that poor quality programs are not allowed to persist.

### **How well do CTE programs serve their students?**

As the expectations and requirements for CTE programs have risen in recent decades, the end goal for CTE participants has changed significantly. Across the United States, CTE programs are being asked to prepare students for postsecondary education or career employment. CTE is no longer for the non-college-bound; it is an alternative route to decent employment and further learning for its participants. This new “bar” for quality has placed great stress on local programs and schools—and on state governments that oversee vocational education at the high school level.

Pennsylvania is no different and the growing pains are painful. Some schools have been better equipped and better able to improve student outcomes; others have had more trouble. The demands are significant on both the academic and technical fronts. Students should leave high school able to perform academically like all students in the state’s high schools. Moreover, the technical preparation must also be of high quality: responsive to employer needs and adequate to meet employer expectations in the local labor market.

How well are Pennsylvania’s CTE programs doing? Much improvement is needed if CTE is to play its rightful role as an important contributor to the economic strength of the state and the economic advancement of its residents.

The completion rate for the class of 2003 across all secondary programs was 54 percent. This masks great variation, both across institutions and within segments of the secondary CTE system. Within high school CTE programs, completion rates averaged only 35 percent (with health occupations and business occupations the lowest). In the ACTES, completion rates were much better, averaging 72 percent across all schools and with most programs clustering between 70 and 75 percent (see chart) These summary data must be interpreted carefully. Many students entering CTE programs at comprehensive high schools are not committed to completing and take only a few courses to augment their academic programs. How much the variation in completion rates reflects student intentions and interests must be assessed carefully before drawing conclusions.

**Program Completion Rate by Program Cluster  
Statewide High Schools, Statewide ACTESs, Statewide  
Class of 2002**

*Source: www.catsreports.ed.state.pa.us*

Completion	High Schools	ACTESs	Statewide
<b>0-25%</b>	<ul style="list-style-type: none"> <li>• Arts, AV Tech, &amp; Communications: 19.3%</li> <li>• Health Science: 20.4%</li> <li>• Business &amp; Administration: 21.4%</li> <li>• Retail, Wholesale Sales &amp; Services: 23.3%</li> </ul>		<ul style="list-style-type: none"> <li>• Business &amp; Administration: 23.8%</li> </ul>
<b>26-50%</b>	<ul style="list-style-type: none"> <li>• Hospitality and Tourism: 26.2%</li> <li>• Manufacturing: 30.2%</li> <li>• Law &amp; Public Safety: 34.8%</li> <li>• Information Technology: 36.3%</li> <li>• Transportation Distribution &amp; Logistics: 38.4%</li> <li>• Agriculture &amp; Natural Resources 39.1%</li> <li>• Architecture &amp; Construction 43.9%</li> </ul>		<ul style="list-style-type: none"> <li>• Retail, Wholesale Sales &amp; Services: 37.1%</li> <li>• Arts, AV Tech &amp; Communications: 46.4%</li> <li>• Agriculture &amp; Natural Resources: 47.7%</li> </ul>
<b>51-75%</b>	<ul style="list-style-type: none"> <li>• Scientific Research &amp; Engineering: 52.2%</li> <li>• Human Services: 71.5%</li> </ul>	<ul style="list-style-type: none"> <li>• Business &amp; Administration: 62.6%</li> <li>• Retail, Wholesale Sales &amp; Services: 61.8%</li> <li>• Scientific Research &amp; Engineering: 61.9%</li> <li>• Agriculture &amp; Natural Resources: 66.1%</li> <li>• Manufacturing 69.8%</li> <li>• Transportation Distribution &amp; Logistics: 70.0%</li> <li>• Information Technology: 70.4%</li> <li>• Health Science: 72.4%</li> <li>• Architecture &amp; Construction: 72.9%</li> <li>• Hospitality and Tourism: 73.4%</li> <li>• Law &amp; Public Safety: 73.6%</li> <li>• Arts, AV Tech &amp; Communications: 74.7%</li> </ul>	<ul style="list-style-type: none"> <li>• Information Technology: 53.7%</li> <li>• Health Science: 54.1%</li> <li>• Scientific Research &amp; Engineering: 57.0%</li> <li>• Manufacturing: 58.6%</li> <li>• Hospitality and Tourism: 60.5%</li> <li>• Law &amp; Public Safety: 60.6%</li> <li>• Transportation Distribution &amp; Logistics: 64.0%</li> <li>• Architecture &amp; Construction: 67.9%</li> <li>• Human Services: 74.1%</li> </ul>
<b>76-100%</b>	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Human Services: 79.2%</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<b>All</b>	<b>32.7%</b>	<b>71.4%</b>	<b>51.7%</b>

Minorities complete at far lower rates than their white counterparts. While minorities comprised 22 percent of total enrollments, only 13.5 percent of completers were minority. The gap is particularly pronounced for blacks in high school CTE programs: blacks comprise 25 percent of enrollments but only 15 percent of completers.

CTE students tend to take less rigorous academic programs than do their peers in comprehensive high schools. This is partly a function of the lower academic performance and proficiency of CTE students upon entering their programs, but it is also a legacy of the past academic expectations in many CTE programs. Course-taking of challenging academic curricula has been on the rise over the past several years,

although ACTESs tend to lag behind high school CTE programs on the percentage of their completers who have also passed advanced academic courses. The press for higher academic standards is beginning to show results. Since 1998, the percentage of CTE completers taking college prep English almost doubled from 33 percent to 65.7 percent (although part of that increase is due to a change in reporting definitions). Smaller increases have been seen in passing rates for algebra I and II, trigonometry, biology, chemistry, physics, and a foreign language.

However, attainment of academic skills, vocational skills, diplomas, and technical credentials are still unacceptably low, according to the Commonwealth's 2002-03 Vocational-Technical Education Accountability Report submitted to the federal government. Only 20.6 percent of eleventh-grade CTE students scored at proficient or advanced levels on the math PSSA, and only 32.7 percent reached proficiency on the reading PSSA. Just under half of the state's CTE students successfully achieved competency levels at or above the national norm on NOCTI or other PDE-approved technical skill tests. A little more than half the students in CTE programs whose class was scheduled to graduate in 2002-03 completed all program requirements and received diplomas in the graduating year (54 percent). Only 514 industry certifications were earned by secondary CTE students in 2002-03, 118 of those in cosmetology and 135 in Microsoft Office.

The caveats to these summary data are many. A number of programs and schools across the state are achieving high-quality outcomes for their students and are, in fact, models pointed to by CTE officials in other states. The level of aggregation of these data hides variations across regions, urban/suburban/rural lines, racial and ethnic groups, special population status, and more. Some schools are in booming economic areas, where employers are actively involved in program design and communication over standards, while other schools are less fortunate. These data should be taken for what they are: one indicator, much as a person's body temperature helps in assessing overall health but leaves as many questions as answers.

The highest performing schools and programs in Pennsylvania have much they can be proud of. There are CTE programs that have raised expectations and set high standards for all students, increased postsecondary enrollment, and generally improved outcomes for their student population. There are programs that have worked closely with local district officials to ensure that CTE program placements are appropriate and that supports are in place to ensure student success. There are programs that have become so sought after that they have instituted admissions processes to manage enrollment, and others that have demonstrable success in facilitating transitions to postsecondary education.

Nevertheless, there is no doubt that change is needed if CTE is to be a broadly desirable route for Pennsylvania students to academic and technical learning and preparation for postsecondary success for the 21<sup>st</sup> century economy. As the Keystone Commission reported, some of the most high-demand jobs in the Commonwealth are what have been called "gold collar" jobs, those that require some additional postsecondary training and offer wages of at least \$25,000 a year. According to the Commission, 57 percent of these jobs do not require a four-year degree, but most require a high level of specific skills (Keystone Commission 2001). A high-quality, modern CTE system can be a powerful player in the preparation of young people for academic and technical learning required of these positions—but only if programs keep up with both the rising academic

demands on high school students and address the needs of those Pennsylvania employers who can provide quality employment and career opportunities.

### How are CTE programs trying to improve?

In our interviews and meetings with people in the field working hard to serve their students well, we found that school leaders, faculty, and key stakeholders in business, education, and government are pursuing or advocating four types of strategies:

- Improve academic performance, integrate core academic standards and improve student performance on standardized assessments.
- Improve cooperation and joint decision-making with sending schools to ensure that students are appropriately informed of CTE options and referred to programs well-suited to their needs.
- Reach out to employer advisory groups and linkages with economic and workforce development processes so that programs are well suited for existing and emerging local, regional, state, and national employer needs.
- Increase attention on ways to improve the rates of CTE student enrollment in postsecondary education.

Regional career and technical centers are employing a range of methods to increase academic achievement, better integrate technical and core curricula, and raise academic standards for CTE students. These interventions include professional development for teachers, programmatic and scheduling changes to increase attention to core academic subjects, and increased academic remediation opportunities. As a result, some schools have significantly improved the performance of their students. A great deal remains to be done, however. Weak academic performance and the view of career and technical programs as “second class” education prevails in some programs and schools, and guidance from the state in this regard is lacking.

The relationships between the area school and its sending districts function well in some places, but they are difficult and strained in others. The success of area programs is in part due to the strength of support in local districts and surrounding communities. Similarly, students appear to be better served where planning is truly joint and career and technical programs are viewed as part of the overall set of options available to students, rather than as a separate enterprise in competition with the local high school.

As stated above, Pennsylvania enrolls a significantly higher proportion of special needs students in CTE programs than in home schools. Many believe, and a recent state auditor report reflected, that the demographics of the CTE student body should more closely mirror that of their sending institutions. What is lacking is a consistent approach and guidance regarding the district-area relationship, how to manage it, and how to build a mutually supportive, coherent approach. We noted situations where, for example, the conflicting schedules of sending schools provide significant challenges to the area programs and where receiving CTE programs had no involvement in referrals to them.

Regarding PSSA performance, it is clear that, with the exception of comprehensive technical high schools, academic performance of CTE students must be approached as a partnership between ACTES and local district. Frequently, ACTES students requiring significant levels of remediation when they enroll. CTE programs should be evaluated



based on the gain in performance during a student's tenure there. Local districts should be held responsible for developing academic interventions regardless of where it is provided.

Area CTE schools use a variety of mechanisms to coordinate their program offerings with business and industry needs and trends. Schools attempt to stay abreast of workforce demands through occupational advisory committees (which make recommendations regarding curricula and equipment), local Workforce Investment Board coordination, and efforts to obtain industry certifications for programs and teachers. The Commonwealth's Center for Workforce Information and Analysis, as part of its obligations under the Workforce Investment Act of 1998, generates an annual list of occupations that have a high potential for sustained demand or growth in the state and local areas. Some CTE schools use these reports to monitor openings and wage rates for different jobs in the Commonwealth as they develop or revise program offerings. Admittedly some local CTE efforts are more effective than others, as is evidenced in part by close partnerships with and investments by business and industry and the pursuit of higher levels of teacher training and program certification.

While the operation of local advisory committees to ensure responsiveness to local economic need is laudable, the needs of today's economy do not necessarily reflect what constitutes sound investment in the future direction of the Commonwealth. Close links to local workforce needs are not sufficient; planning must reflect the broader needs and strategic direction of the state as well. This ability to sense and scan future needs of the economy, and to ensure they are reflected across the curriculum, is essential. The many CTE programs offered across the Commonwealth map to broad industry segments that characterize the economy. The question is whether the content of those programs is of sufficient rigor, breadth, and depth to support the needs of the 21<sup>st</sup> century.

Equipment, or its lack, is often held up as an impediment to program quality and sound instructional design. However, equipment investment does not by itself raise standards, ensure industry credentialing, improve teaching, or guarantee more learning. Rather, investment is often more likely to follow well-developed programs. Building explicit linkages to the governor's economic agenda can ensure both value and adequate investment.

In several of the programs visited, CTE is not only viewed as a meaningful route to employment, but the rate of postsecondary enrollment is increasing. Schools are developing stronger and more effective articulation agreements with postsecondary partners and seeking other ways to facilitate the transition from high school to college. But career and technical education still fails to provide a clear pathway to further learning for many students who wish to pursue postsecondary education.

Our site visits and discussions with CTE leaders and education officials across Pennsylvania provided rich examples of the commitment and dedication of Pennsylvania educators to achieving important results for their students. That information shaped our analyses and recommendations. At the same time, our research led us to the clear conclusion that the CTE community—its schools, programs, leaders, instructors, and stakeholders—cannot on its own make the kind of significant changes that are needed to improve performance, quality, and outcomes across the system for all students. State leadership, support, and incentives to change are needed. The recommendations in this report reflect our assessment, based on our research, of ways the Commonwealth can improve its secondary CTE system—improvement that is critical if high school reform is to have sufficient traction and results in the state.

## **Components of Career and Technical Education Reform: Key Approaches from Other States**

Across the country, states are revisiting their career and technical education systems, frequently in concert with broader efforts to improve high school outcomes for young people. It is extraordinarily difficult to summarize policy and practice in career and technical education nationally, given the great variation among the states in governance, delivery structures, level of investment, priority industries and fields of training, data systems, and student profiles. Nevertheless, JFF's review of national data, the experience of several leading states, and other sources has led us to identify a number of principles to guide efforts to improve CTE quality. These are:

- Integration of CTE reform with overall high school reform efforts driven by a commitment to high academic standards;
- Adoption of nationally recognized industry standards;
- Implementation of career awareness and planning organized around broad industry clusters;
- Attention to the transition to postsecondary education and careers;
- Close linkages to business and industry, with thoughtful use of local and regional labor market trends;
- Investment in system capacity and teachers; and
- Strengthening of quality control and program review processes.

### **Integration with overall high school reform efforts, driven by a commitment to high academic standards**

New York, Maryland, and others that are leaders in CTE reform at the state level have developed plans for career and technical education improvement in consonance with overall high school reform efforts, rather than as separate silos with separate goals and standards. As a result, CTE standards, curricula, teaching, and learning are expected to align with school, district, and state academic requirements, rather than develop on a stand-alone basis.

Every state we examined has made improvement in academic achievement and alignment with state academic standards a fundamental component of CTE policies. As the basic premise from which other policies and priorities derive, this emphasis on high standards, consistent with standards for all high school students in the state, has driven changes across the high school CTE curriculum. Innovative CTE systems have developed academic interventions to support student achievement, invested significantly in raising the academic content of their CTE curricula, and taken steps to ensure that vocational concentrators do not receive lower levels of academic instruction when in their sending schools. Ohio, for example, is redeveloping technical program standards to include academic standards, rather than cross-walking the one to the other. Ohio used information technology and construction technology curricula as models for

demonstrating how to integrate math and reading into technical content. Some states have used High Schools That Work as a systemic high school reform approach, rather than solely as a reform targeted to CTE-focused programs housed within the vocational education unit of the state department of education.

The part-time structure of many career and technical education programs has made academic integration difficult, with students in semester rotation programs between CTE and their home schools at greatest risk of losing ground. To address these challenges, some states have adopted a common schedule to reduce down time during the school day and different arrival and departure times. Connecticut, for example, adopted a statewide common schedule that was found to facilitate mobility and options for students. Where regional career and technical schools overcome the stigma and stereotype of traditional vocational education, it appears to be due to raising standards and ensuing increasing enrollment.

States and communities are promoting a wide range of strategies to improve CTE program quality and rigor. Some jurisdictions have increased integrated lesson planning time. Others ensure that area technical schools have academic teachers on staff. Others are emphasizing raising CTE teacher qualifications to be more consistent with the preparation of academic preparation. Professional development receives considerable attention in some jurisdictions, which works to improve coherence and consistency across all teacher development programs, regardless of format and provider. Principal leadership in instruction and integration is critical as well.

Massachusetts has demonstrated substantial improvement in academic performance, along with lower failure rates for students, at many of its area vocational schools. State officials attribute the improvement to a number of factors, including changes in scheduling, enhanced professional development, performance contracts with teachers, partnerships with business, and sustained efforts to shore up the academic content and support for strong academics in technical curricula. Maryland, California, Virginia, New York, Connecticut, and several other states have used similar strategies and report a shift in vocational enrollment and performance as a result.

Ohio has made program approval contingent on academics that prepare for postsecondary education and robust alignment with industry needs. Some states, notably California and Kentucky, have used a legislative strategy to drive CTE reform, introducing legislation to ensure that CTE programs are held to the same standards as their academic counterparts.

### **Adoption of nationally recognized industry standards**

Several states have taken significant steps to ensure that CTE programs are consistent with applicable national industry standards. Fundamental elements of this approach are requiring (or at least strongly encouraging) programs to be industry-certified, grant industry certification to students, and employ appropriately certified personnel. Maryland, for example, has created incentives for CTE instructors to attain industry-recognized technical credentials in their fields. This has led to strong partnerships that join local and state CTE efforts with industry associations, such as PrintEd, NATEF (automobile repair), and the state horticulture association.

The proliferation of industry certifications in some fields, and their absence in others, is worthy of a caveat: it is important to have quality criteria that help policymakers and practitioners determine which standards are most appropriate at the secondary level, consistent with a program's educational objectives. Driving toward consistency with industry best practice and related certification also requires investment in infrastructure and equipment. Maryland has struggled with questions surrounding certification and how to ensure that technical skills are supplemented by strong academic core requirements, which most industry skill standards do not reflect.

### **Implementation of career awareness and planning and broad industry clusters**

Whether called “career clusters,” “career fields,” “career pathways,” or another title, program strategies designed to help students understand, at an early age, the range of career options available to them and the requirements to get there represent an increasingly common approach across states. Policymakers are emphasizing the need for early education about careers so that students are well informed and able to make good decisions later in their academic careers. Such awareness-raising processes appear to increase demand for high-quality CTE programs, as significant numbers of students seek sequences in secondary school that clearly articulate to both postsecondary education and career paths. The federal government has grouped the nation's industries into 16 career clusters. States are increasingly using these clusters, or some variant of them, to rethink program structure, curriculum, and instruction, helping to ensure that job-specific technical training is part of a larger, more comprehensive education in a broad career field, and that it is characterized by strong underlying academic breadth and depth. The cluster framework also helps states target high-growth sectors important to the state's economic future in decisions about the direction of CTE programming.

### **Attention to the transition to postsecondary education and careers**

Explicit steps to ensure that CTE is clearly articulated with what happens before and after high school is another theme in state policy development. As with the career awareness approach, states are seeking ways to better align secondary institutions with postsecondary institutions and programs. These efforts take the form of articulation agreements with two- and four-year institutions so that CTE credit in high school is directly transferable toward postsecondary credentials, dual enrollment and early college programs, on-campus joint programs and partnerships, etc. In New York, for example, all CTE programs must have articulation agreements with postsecondary institutions.

### **Close linkages to business and industry, with thoughtful use of labor market trends**

Through strong ties with industry and effective and timely use of labor market data, states are trying to make CTE offerings as consistent as possible with emerging regional workforce needs. This is critically important as states try to link workforce and economic development in strategies that can grow local talent and retain qualified young people in local, regional and state labor markets. This approach guides Louisiana's Vision 2020, which has convened business, government, and education partners to establish industry-based certification as the pivotal component that links and supports four primary

statewide reform initiatives: standards-based school accountability enhancement; higher education redesign; workforce education/training overhaul; and economic development.

Ohio's approach relies on university research and high-level industry panels. They forecast trends and needs in each industry area and then craft technical content standards to support them. Ohio further requires districts to update their career and technical education plans to be consistent with the 16 broad career fields (clusters) and include courses for grades 9-12 and postsecondary articulation.

With the assistance of hundreds of business partners, Maryland's CTE system has established a Career Cluster Framework. The career pathways guide the development of instructional programs to prepare students for career opportunities that are important to the state. The state has identified 48 distinct CTE Pathways Programs at the secondary level, based on an assessment of existing secondary programs and postsecondary opportunities and the recommendations of business and community experts. Comprehensive program development and adoption will only take place when an external partner has already developed a program that includes resources and standards of a quality that meets stakeholder needs or a high-quality assessment or certification is available that covers most programs. Examples include: pre-engineering programs offered by Project Lead the Way and a Database Academy provided by Oracle. New programs in business education and a proposed Teaching Professions Academy are being created by partnerships across school districts. The end result is a program development and renewal process that is tied closely to employer and labor market needs and is not custom-designed by each local district or school.

### **Investment in system capacity and teachers**

Despite constrained resources, states must find means to invest in enhancing system capacity to support higher-quality CTE programs. Some states have focused investment on professional development to increase the academic content of CTE programs. Others have focused on ensuring that teachers are appropriately industry-certified. Rather than use new resources, these investments frequently result from refocusing existing priorities. The National Association of State Directors of Career and Technical Education Consortium has documented state needs and credentialing requirements for CTE programs, as well as the range of professional development activities for CTE teachers.

Virginia is of note in the centrality of coherent professional development in its efforts to emphasize both academic integration and industry credentialing. Investment in teacher development has been driven primarily from the state level, through funding a Career Resource Center and professional development conferences, academies and programming across the state. This process has allowed Virginia to build consistency in professional development for CTE teachers, increased joint planning time, and strengthening teacher preparedness in both academic disciplines and technical credentials. Ohio uses annual CTE leadership forums to link programs to emerging economic and education trends and bring in national experts in secondary and postsecondary CTE design. The state uses these methods to help programs identify and adopt promising practices from other jurisdictions. Quality control and review processes

As in Pennsylvania, education across the nation is primarily highly decentralized. As a result, states have pursued indirect means of enhancing program quality. Starting with clearly articulated expectations regarding academic and technical standards for CTE

programs, a variety of options are available to this end. Promulgating guidance, increasing awareness, conducting program reviews and approvals, and investing in technical assistance and professional development are among the levers available to states to support continuous improvement. The ISO process, accreditation by an outside agency, and the Malcolm Baldrige National Quality Award application provide self-assessment methodologies that can serve as the basis for local program improvement.

The program review, approval, and oversight processes in several states are worth noting. Maryland's approval process hinges on a self-assessment that provides clear guidelines for program improvement and requires schools to identify the weakest 20 percent of their programs for attention. Kentucky has promulgated state CTE performance measures that link academic and technical requirements with improvement plans.

In New York State, the education department has spent the last several years developing a process for reviewing existing CTE programs and creating new ones. All programs must undergo a structured approval process that includes visits by school district officials and outside experts. The visiting group looks for evidence of: a quality curriculum that includes integrated academics; faculty with state certification in the appropriate academic and/or technical fields; technical assessments that certify that students meet current industry standards; and work-based learning experiences. Programs must also collect data on student performance and progress. Once approved locally, program documentation is then sent to the state for its endorsement.

This new process has invigorated local CTE efforts, increasing demand from local programs to earn the state's "seal of approval." Over 700 programs have been approved since 2001 and the number submitted for approval continues to increase. Engineering/technology and human/public service programs are the most common new approvals. Through this process, New York has seen enrollment increases, better attendance in CTE programs, and the beginnings of better results of state academic Regents exams. The process has also strengthened ties between academic and technical instructors and between employers and CTE programs and schools. The percentage of students who receive a CTE endorsement on their diplomas is climbing.

States are pursuing a range of simultaneous efforts to raise the quality of career and technical education and ensure its economic relevance. State commitment and leadership is critical. Systemic and sustainable improvement cannot be done piecemeal or left solely to local initiative: it must be part of an overall system improvement effort. Most promising, JFF's scan of state CTE reform efforts has found that the most creative and aggressive states—in terms of raising academic and technical standards and increasing program responsiveness to college and employer expectations—can document increased enrollments, improved student outcomes, and more value-added for the state's investment.

Maryland provides an encouraging case study: increased standards and stakeholder engagement throughout the 1990s have led to increases in the numbers of CTE concentrators, completers, and completers ready for college-level work. Today, more than 50 percent of high school students are enrolled in high school CTE programs. One fourth of the state's 2004 graduates were CTE completers. The number of CTE students also completing the coursework to prepare for college admission has risen from 14 percent in 1993 to 41 percent. Students in some CTE pathways, such as health and bioscience or arts, media, and communication, outpace their high school peers in taking rigorous courses, including success in math courses beyond geometry and algebra II.

## **Findings and Recommendations for Pennsylvania**

To develop recommendations regarding future policy related to career and technical education in Pennsylvania and opportunities for improvement, Jobs for the Future collected a wide range of perspectives regarding CTE in the Commonwealth and nationwide. Taken together, these recommendations will result in bold leadership for CTE in Pennsylvania and allow for the transformation and systemic reform over time that is required for lasting improvement in student achievement. Timing is important, for the Commonwealth and the nation are at critical junctures in ensuring educational success and opportunity for all its students, and in building a vibrant, responsive 21<sup>st</sup> century economy. We present major recommendations in four categories: academic rigor, industry relevance, postsecondary transition, and state leadership and capacity.

### *Academic Rigor*

1. Insist on higher academic standards for all CTE programs, regardless of career field, economic conditions, or demographic characteristics.
2. Take steps to further integrate CTE, regardless of program model, with broader secondary school reform efforts.

### *Industry Relevance*

3. Expect CTE programs to adopt nationally recognized industry standards (or, in their absence, a recognized measure of quality) to demonstrate relevance of programs to the demands of the 21st century economy.
4. To ensure that Pennsylvania's workforce is prepared to meet the demands of the new economy, tie CTE programs closely to employer needs and labor market trends.

### *Postsecondary Transition*

5. Strengthen CTE programs significantly and provide opportunities for youth and adults across the Commonwealth by strengthening links to postsecondary education through articulation and other strategies that reduce turf barriers between education sectors

### *State Leadership and Capacity*

6. At the gubernatorial level, craft a simple, clear, consistent message regarding the role of high-quality secondary career and technical education in meeting Pennsylvania's education and workforce needs.
7. To achieve the dual objectives of strong academic underpinnings and industry relevance, realign state, federal, and local resources to increase and target investment in teaching capacity and system support.
8. Charge the Pennsylvania Department of Education with a much stronger leadership role and an increased role in quality control and program review.

## **Academic Rigor**

### ***1. Insist on higher academic standards for all CTE programs, regardless of career field, economic conditions, or demographic characteristics.***

#### *Finding*

CTE programs that have raised standards, increased postsecondary enrollment, improved recruitment and retention, attracted additional funding, and built strong relationships with sending schools' personnel, parents, and students have done so largely because they have made it clear that academic rigor is at the core of career and technical education programs.

#### *Recommendations*

The linchpin of Pennsylvania's CTE program improvement efforts must be standards-based reform. Consistent with the principles of No Child Left Behind and the Commonwealth's PSSA process, CTE programs should be held to the same academic standards as other high school programs—in policy and practice. Where it exists, the general, or vocational, track should be eliminated immediately in sending high schools.

Regardless of what it is called, CTE students in some circumstances find themselves in separate academic courses with different expectations and curricula. To prevent the tracking of students into lower quality programs, we also recommend that the Commonwealth consider eliminating, through legislative or regulatory action, all courses and programs that could be considered general or vocational track in sending high schools. All students should be provided with opportunities to pursue the same academic content: CTE students should be held to the same academic standards as their non-CTE counterparts. In the words of one school director, "It only makes sense that CTE programs should be held to the same standards as other courses."

As students decide to pursue CTE programs as concentrators or on a less intensive basis, attention should be given to their entering and ongoing academic performance. Students who enter CTE programs below grade level in core academic subjects should be provided with remediation. Perhaps most important, the academic content of CTE curricula should be upgraded to capture and teach underlying academic content.

Professional development should be focused to build academic rigor into CTE curricula. Conversely, programs that help academic teachers build technical competencies into their methods also should be pursued. To further strengthen the academic content of CTE programs, schools should be encouraged to hire math, reading, and science teachers who work across programs to improve performance in addition to providing remediation. Other methods of integrating reading, writing, and mathematics across technical fields should be pursued as well.

Current Pennsylvania vocational education law and codes are silent on academic expectations and achievement. These academic expectations are specified in the general K-12 public education codes and laws. High academic standards must be set for career education courses and programs of study to ensure that students who elect CTE achieve the academic credentials necessary to pursue either postsecondary education or training that will equip them to compete effectively for high-paid jobs. Right now, this



goal is achieved unevenly in practice. The governor should therefore consider legislation or regulation that strengthens the expectation that CTE students will achieve to the same academic standards as all high school students. Such action would amend the Commonwealth's law and codes to require that CTE programs are aligned with and clearly integrated with the state's academic standards. It should also be designed to ensure that the state's Career Education and Work Standards (under development) reinforce this objective. These standards should be competency-based, aligned appropriately with the academic standards, and translate into meaningful program objectives.

The development of statewide standards for career education and work, as mentioned above, will provide an overall standards-based framework that places CTE within a students' overall educational experience. To implement Pennsylvania's academic standards, "anchors" were developed to provide enough detail to allow the standards to translate into meaningful competencies and learning objectives. The same process should be applied to Pennsylvania's Career Education and Work standards, either in their current form if they are approved by the State Board of Education, or as revised. It is important to acknowledge that significant adjustment and guidance will be necessary to implement these standards for specific grade levels, just as was the case with academic standards when they were promulgated.

Many career and technical education programs are developing crosswalks to demonstrate the applicability of academic requirements to technical program areas. This is an important step in integrating content; in the future, standards for technical programs should be revised to include relevant academic components.

The call for higher standards for all students may prove particularly difficult for some part-time institutions that rotate students from regional to local school on a weekly, monthly, or semester basis. Where scheduling of career and technical programs results in student absences from their home schools for extended periods, there is worrisome potential for lower expectations in core academic topics. CTE students should be integrated with other students in their home high schools and provided with the same choices. Academic subjects offered for vocational concentrators as a separate cohort should be eliminated.

Effective use of data is critical if programs and state officials are to succeed in raising academic performance for all students. Accurate and easy-to-use data on student outcomes can pinpoint areas of program weakness and shrinking student (or employer) demand. It can also make clear that part-time regional career and technical institutions cannot be held responsible for raising student achievement in absolute terms. Rather, they should be held accountable for improvement (or value added) in student achievement during tenure in the CTE program. Accountability should be shared to remove the incentive for sending schools to attempt to improve their school-wide performance by shifting students to other institutions. Reporting of data regarding enrollment, student performance, graduation, etc. should be integrated so that CTE information is easily related to the larger secondary education enterprise. This in essence happens at the local level in many places, but it is not the manner in which state-wide data are presented and analyzed.

The Pennsylvania Association of Vocational Administrators can play a significant role in developing and promoting strategies that strengthen CTE's academic underpinnings.

PAVA should emphasize the importance of academic achievement and postsecondary placement and relate CTE performance to broader education reform efforts. The association can also be instrumental in identifying promising practices among its members and providing opportunities to share those practices across Pennsylvania.

***2. Take steps to further integrate CTE, regardless of program model, with broader secondary school reform efforts.***

*Finding*

Efforts to improve career and technical education typically occur on a separate track from broader high school reform efforts. This is not only potentially duplicative and counterproductive but also not in the best interests of students.

*Recommendations*

Quality career and technical education is one option in the plethora of high school opportunities available to today's students. To ensure that career and technical education is aligned with state education standards, provides opportunities for all students, and is not a "second class" system, the Commonwealth should take steps to ensure that state and district-level high school reform efforts encompass the CTE component. The consensus view from our research, as expressed by one interviewee, is that "CTE should be part of the K-12 reform agenda, and programs that are not meeting standards should be closed."

If Pennsylvania's high school students are to be ready for either college or career after high school, all students will have to participate in a college-prep curriculum. The American Diploma Project of Achieve, Inc., a national organization led by governors and CEOs, has developed a set of standards that are set to the expectations of colleges and high-quality employers nationally. Few state standards and assessment systems are pegged as high as these standards, but they are something that the Department of Education should look at carefully as it assesses the quality and adequacy of its academic accountability system.

High Schools That Work is a model of high school improvement that provides for the smooth integration of technical and academic education. In most states, it is organized not exclusively as a career and technical education strategy but as a high school reform initiative for increasing the number of students in a school or district who pass employer exams and go on to further study without having to take remedial courses. In Pennsylvania, High Schools That Work has not been well-integrated with high school reform as a whole; rather, it is located in the vocational education bureau. This disconnect may be one reason why Pennsylvania's is not seen as one of the stronger HSTW state initiatives, Pennsylvania's 34 HSTW schools are, in general, less effective at raising academic achievement in reading, math, and science than are HSTW schools that have implemented the model most intensively and faithfully.

To support the integration of career and technical education in overall high school reform efforts, Pennsylvania should merge its Project 720, High Schools That Work, and CTE initiatives under an overarching high school reform umbrella. As a resource, High Schools That Work provides a strong foundation and robust methodology for Pennsylvania to continue to use as a departure point and to adapt for local use. CTE

need not be a stand-alone system, particularly if it is to be a legitimate and successful pathway to postsecondary education and careers. In addition, Tech Prep should not be treated as an effort independent of sound career and technical education programs. While there may be distinct funding streams, the objectives of CTE in general are indistinguishable from Tech Prep.

Educational planning for each student can play a significant role in accelerating integration. Through the promulgation of career education and work standards, Pennsylvania is taking an important step to help parents and students understand the array of options available to them, as well as the pathways required to reach different career and educational goals. Many states have used a “career cluster” or “career pathways” framework to help structure individual educational planning and awareness.

Choice—in terms of options that allow students to pursue their interests—is a fundamental principle of strong education in the 21<sup>st</sup> century. Similarly, raising awareness of options is critical to the ability of parents and students to make informed decisions. The career pathways (or cluster) concept provides an organizing mechanism for helping parents and students understand the relationship between education and career choices; it also helps teachers and administrators structure meaningful programs and provides options that are consistent with both academic objectives and workplace realities.

Such integration will lead to stronger placement processes. At the district level, CTE leaders should actively participate in sending districts’ decisions about student referrals to CTE programs, and they should be encouraged to provide information well before high school regarding career pathways and options. Similar collaboration should occur with the preparation of IEPs for special needs students. In some areas, there appears to be considerable lack of understanding of the relevance of CTE programs to special needs students. A common concern, voiced by one interviewee, was that “placement in CTE is too often the decision of counselors and not the student and their interests.” From our research, we believe that the State Board of Education might need to introduce specific regulatory language regarding this and other aspects of access and admissions to CTE programs and schools.

Good decisions follow from good information, and steps need to be taken to ensure that parents and students fully understand the range of available options leading to postsecondary education and employment, and that they use that knowledge to make sound decisions. CTE institutions and leaders need to be at the table as part of a comprehensive educational planning process—an “artful use of infrastructure” in the Commonwealth—as opposed to an isolated, stand-alone program.

### **Industry Relevance**

- 3. Expect CTE programs to adopt nationally recognized industry standards (or, in their absence, a recognized measure of quality) to demonstrate relevance of programs to the demands of the 21<sup>st</sup> century economy.***

### *Finding*

While not a panacea, industry standards can be an effective means of raising CTE program quality and relevance. However, there are significant drawbacks to relying exclusively on industry certification as a measure of CTE program quality. A thoughtful process is required for assessing applicability and quality of industry certifications to determine “state-of-the-art” practice.

### *Recommendations*

Industry standards must be applied to CTE programs. Where no appropriate national standard or certification is available, a substitute should be sought that identifies field-specific, measurable competencies. (Efforts in New York State and Maryland can provide useful guidance.)

Pennsylvania should consider a call to all secondary CTE programs to be industry-certified, as appropriate. Such a call would demonstrate that the state is serious about ensuring that CTE offerings are current and relevant. However, this would require state-level support to implement.

First, rather than having every institution determine independently which industry certifications are of the highest priority, such an analysis should be conducted at the state level. At present, the Department of Education does not have a full accounting of the number of its programs that are industry-certified, although some efforts to collect and organize this data have begun. The draft PDE Resource Guide for Industry Credentials was a good step in helping districts and area schools better maneuver the complicated terrain of industry standards. It should be revised and expanded to include evaluation criteria that help schools determine whether credentials are strong enough or need to be supplemented.

Second, industry certification is likely in places to require investment in infrastructure and equipment, so that teachers are well qualified, curricula are modern and relevant, and equipment is appropriate to the technical training. The Pennsylvania Department of Education will need to identify some options for localities that lack the ability to resource industry certification appropriately but wish to pursue them.

Finally, an investment in teacher development will be required, to assist teachers in accessing appropriate technical training. It is arguable that programs that are not at industry standards, or are not on a relatively short timeline to reach those standards, should not be offered, and students should be counseled to seek alternatives.

Some industry standards and certifications reflect the breadth and depth desired in a high-quality secondary education. Where there is a suitable, industry-recognized program, such as some certifications in automotive fields, programs should be required to seek certification or risk termination. Others are short-term, technical credentials that lack the industry exposure, technical depth and understanding, and underlying academic proficiency required of CTE students. As such, industry certification is often best considered a “value-added” component of CTE: concomitant with a meaningful high school credential, reaching the standard conveys a degree of competence and ability that has economic value.

Although the current law calls for the establishment of local advisory committees to advise vocational education boards on business and industry needs and requirements, there are no requirements for certification of programs. A process is in place for the state to approve career and technical education programs, but it is fairly perfunctory and the approval is not based on any recognized standards. Recognizing the complexity and industry-specific nature of industry-developed certifications, Pennsylvania should consider legislation or regulation that requires career and technical education programs to reflect current best-practice and industry accepted standards. Such legislation would call on all CTE programs to demonstrate program quality, rigor, and relevance by meeting a series of criteria that tie content to industry standards and certification, where available and where endorsed by an independent body. To ensure quality and foster consistency across the CTE system, certifications should be approved statewide rather than through a local process. A statewide board should be tasked with this responsibility via executive order or legislative authority. Pennsylvania may want to consider its statewide WIB or the Board of Education as the vehicle.

As already noted, we further recommend that career and technical education programs and courses be clustered into coherent economic groupings in line with the state's growth industries and economic priorities. "The Commonwealth should use the career clusters to organize employer involvement and standard setting" is the consensus view, although this endorsement far exceeds actual practice and schools' organization.

Pennsylvania is a major subscriber to NOCTI examinations as a measure of program performance. While not recognized as readily as some industry certifications, the NOCTI process has helped provide a degree of consistency to Pennsylvania programs. The Commonwealth should work with NOCTI to broaden the competencies measured in the assessments to reflect academic performance as well as technical job skills.

***4. To ensure that Pennsylvania's workforce is well prepared to meet the demands of the new economy, tie CTE programs closely to employer needs and labor market trends.***

*Finding*

To ensure that programs closely reflect business and industry needs and trends, Pennsylvania has strong mechanisms in place through local Workforce Investment Boards and through its local occupational advisory committees that advise schools about curricula, equipment, and other needs. These relationships are stronger in some regions than others, and there are opportunities to improve this coordination by identifying and sharing examples of partnerships that are particularly effective and by linking local workforce demands to regional, state, and national needs.

*Recommendations*

A common criticism of career and technical education is that it is obsolete, that it has not kept pace with the demands of the current or emerging economy. Programs that are dated and lack enrollment or external demand should be reengineered or eliminated. Mechanisms to ensure relevance and alignment with workforce needs should be bolstered, with appropriate checks and balances to avoid an overly short-term (or, on the other hand, inflexible) approach. The Employer Advisory Boards provide a strong, proven process for ensuring industry linkages. Steps should be taken to identify the

elements of strong advisory board practice and disseminate those statewide. The Department of Education has the authority to issue clear guidelines for building and sustaining strong industry advisory committees: it should do so.

It is important to go beyond current workforce needs to consider potential future directions and economic priorities. While it is impossible to forecast the future with certainty, a viewpoint that is broader than immediate, local needs is essential. Other means of ensuring strong industry partnerships include the use of labor market data regarding industry trends, coordination with Workforce Investment Boards, expanding emphasis on industry certification, and building ties with state economic and workforce development policy directions. Local WIBs can serve not only as sources of data and strategic analysis about workforce needs but also as proponents for financial and in-kind support from industry for equipment and other CTE program needs.

However, the state should not rush to align all program offerings with the highest value industries and occupations. Some of the most promising new industries in terms of wages and career status are not large employers. Programs that prepare large numbers of students that may seem obsolete (e.g., cosmetology, automotive shop) can in fact be quite academically engaging and lead to a sophisticated understanding of industry dynamics, not just basic occupational skills, depending upon how the program curriculum and instruction are designed. It is important to understand state and regional labor market trends and to consider expanding programs that prepare students for the “gold collar” jobs identified by the Keystone Commission; however, flexibility is needed if the state’s interests and local offerings are to move toward one another without alienating parents or students in more traditional program offerings. Vital local industry committees and a vigorous and effective program approval process will be the best guides to aligning state and local interests and programs.

## **Postsecondary Transition**

### ***5. Strengthen CTE programs significantly and provide opportunities for youth and adults across the Commonwealth by strengthening links to postsecondary education through articulation and other strategies to reduce turf barriers between education sectors.***

#### *Finding*

In many ways, Pennsylvania’s education system is fragmented; this prevents the provision of seamless services for students and makes it difficult to take full advantage of existing capacity. Regional career and technical centers have the potential to serve both secondary and postsecondary education needs; in many instances, they also have the capacity to do so.

#### *Recommendations*

It is essential for today’s youth to have some level of education or training beyond a high school diploma. Strengthening links to postsecondary education will maximize opportunities for CTE students to access postsecondary study and succeed in obtaining postsecondary credentials. In our estimation, the recommendations below do not require new legislative authority. However, to increase the likelihood of success and create strong support for change, the Commonwealth should consider legislation or regulation

that provides strong incentives for articulation between CTE programs and the state's postsecondary systems (both two-year and four-year). Such legislation would stipulate that, where possible and appropriate, credits for CTE be applied toward a postsecondary credential. In addition, incentives for institutions to create dual enrollment options for CTE students should be identified. While legislative may not be essential, it will provide strong guidance and direction to local reform efforts.

### *Secondary-Postsecondary Articulation*

The relationship between secondary CTE and postsecondary education must be strengthened to increase student options, facilitate transition, and improve likelihood of postsecondary matriculation and success. Some programs have successfully implemented a range of articulation agreements with two-year and four-year colleges and universities so that CTE credit is applied toward postsecondary credentials. Such articulation should be encouraged, and attention should be paid to ensuring that such agreements actually result in effective transitions for students from high school into college, perhaps by adopting a more standardized state process for developing and implementing articulation agreements. Other means of strengthening secondary-postsecondary links include faculty sharing and partnerships where postsecondary institutions use secondary CTE facilities and vice versa. Dual enrollment has been a priority in some areas and should be encouraged for a broader segment of the high school population.

The process for developing articulation agreements can be streamlined and can be designed to ensure high quality. The possibility of statewide articulation for high-priority programs, and of more substantial assistance from the Pennsylvania Department of Education in facilitating the articulation process, should be considered. Because the kind of collaboration and sharing across education sectors is not always easy to accomplish, the State Board should assess whether regulatory language to promote such cooperation should be specified.

### *Postsecondary Accreditation of Area Career and Technical Education Schools*

Pennsylvania should expand and encourage the ability of regional career and technology centers to seek postsecondary accreditation, as well as their ability to grant college credit for approved technical programs (although this may cause some political backlash if framed poorly). These centers already have statutory authority to seek status as "technical institutes," authority that has been written into state law for several decades (Title 24, Chapter One, Article 18-1841 of the Public School Code). In fact, some career and technology centers have already received Title IV accreditation, thereby allowing them to accept Pell grants and other federal funds, but not to award credit, regardless of program quality and level. This has considerable financial advantages for CTE programs. It is potentially advisable for career and technology centers—many of which serve both adults and high school age students, and many of which provide current certification in a range of technical disciplines—to be able to develop technical program curricula that meet postsecondary credit requirements.

Such a process has a number of benefits. First, it strengthens the postsecondary options for students regardless of age. Second, it provides a clear and strong incentive for career and technology centers to develop advanced programming. Third, it removes the distinction for students between seemingly similar institutions, simplifying the flow of

funds. Community colleges would remain the providers of two-year academic credentials. Career and technology centers could only be accredited in areas that are not redundant with area community colleges. This goal was captured well by one leader interviewed, who stated, “The Commonwealth has never had the resources to fulfill the intent on the number of community colleges needed. How we use the CTE centers to fill these gaps should be strategic and extend the reach of K-14 offerings.”

Postsecondary accreditation processes should ensure to avoid, with a few exceptions, duplication with technical programs currently offered by community colleges. The process for establishing new programs should be jointly managed across the community college and CTE systems. ACTESs should not at this juncture seek status as degree-granting postsecondary institutions; rather, they should have a strong incentive to develop advanced programming.<sup>4</sup> Through strong gubernatorial and PDE leadership, the secondary CTE system should get strong incentives to develop technical programs that meet postsecondary requirements and receive appropriate credit and recognition from the postsecondary system.

To achieve the goal of a seamless integration of education programs, from secondary to certification, two-year degrees and four-year degrees will require strong state leadership to combat what appear to be growing turf battles competition for the same students and resources. Students should be able to pursue high-quality education opportunities and choose based on a level playing field, rather than regulatory mechanisms that protect particular markets.

The Commonwealth, through the Department of Education, recently received accreditation authority from the U.S. Department of Education. In addition to the Middle States and COE accrediting processes, PDE now can play a central role in encouraging accreditation for career and technology centers, providing technical assistance, and ensuring quality.

### **State Leadership and Capacity**

***6. At the gubernatorial level, craft a simple, clear, consistent message regarding the role of high-quality career and technical education at the secondary level in meeting Pennsylvania’s education and workforce needs.***

#### *Finding*

Career and technical education programs are not explicitly part of the Commonwealth’s priority education improvement or workforce development strategies, despite their potential to make substantial contributions on both fronts. Traditional preconceptions of the purpose and role of vocational education, coupled with high variability in program quality, result in confused messages regarding the place of high-quality career and technical education at the secondary level.

#### *Recommendations*

In crafting an approach for improving CTE performance statewide and targeting investments, a message from the gubernatorial level about CTE’s role in high school education, and in preparing the Pennsylvania workforce of the 21<sup>st</sup> century, is absolutely



critical. That message should be reinforced consistently; one of the important state roles is setting overall policy direction and context.

The general thrust of the CTE approach should have two components:

- CTE must be rigorous, preparing students for PSSA success and industry certification.
- CTE must be part of the range of options for future success that are available to high school students.

The first and most important part of the CTE policy effort must be that the same high expectations regarding academic performance apply to CTE programs as to all other parts of the secondary system. Whether for full-time comprehensive technical high schools or part-time programs, the academic expectations must be the same. Action at the local level should follow, strengthening the academic content of CTE offerings through integrating PSSA standards with technical program requirements, reorienting teacher professional development, restructuring programs and curricula where necessary, and providing technical assistance.

According to many observers, Pennsylvania has lacked strong state leadership in CTE; as a result, the system has operated relatively independently based on local prerogative. A strong message from the state level regarding expectations for CTE will be instrumental in helping raise quality. The governor's office is in a unique position to provide a conceptual framework for CTE as part of high school improvement initiatives, helping people understand how it fits and what constitutes quality. A range of other initiatives to improve quality follow from such a policy direction.

CTE programs in Pennsylvania provide excellent examples of state-of-the-art career and technical education integrated with strong academics. For example, some PDE career and technical education initiatives around industry certification and career pathways have set helpful directions, but they have lacked the backing of wider state policy. In other areas, impressive efforts have been made to raise academic standards and postsecondary transition for CTE students. Finding, highlighting, and sharing what works can also serve to help improve the quality of struggling programs. Just as some of Pennsylvania's CTE is of high quality, some programs likely need to be eliminated or significantly restructured. A stronger state oversight process, as identified below, can assist in that regard.

If the state is to play a more assertive role in driving quality and improvement in CTE, this may require the revisiting and revision of existing regulatory authority and language so that governance responsibilities are clearer and so state roles, standards, and expectations are more transparent.

***7. To achieve the dual objectives of strong academic underpinnings and industry relevance, realign state, federal and local resources to increase and target investment in teaching capacity and system support.***

### *Finding*

Some professional development for teachers has focused on integrating academic disciplines into technical programs and raising technical proficiency; such efforts need to be strengthened and replicated. In addition, some facilities lack the ability to provide state-of-the-art programming because their equipment and other infrastructure do not match industry requirements.

### *Recommendations*

#### *Systemic Teacher Development*

PDE, working with the state-funded Centers for Professional Development in Career and Technical Education at Temple, Penn State, and Indiana University of Pennsylvania, as well as PAVA and other education leaders in Pennsylvania, should identify examples of strong professional development that helps teachers of technical disciplines to raise academic standards. There is also a need to provide more coordinated, consistent professional development to CTE across the state. Similarly, programs that improve the ability of sending schools' teachers to integrate technical disciplines into academic subjects should be pursued.

PDE could issue guidance to schools and districts on ways to focus and leverage professional development activities around key state priorities during each school year. Priority topics can be those that require attention across the state; multiple options can be provided for delivery of professional development to instructors. Working with PAVA and others, PDE could assess the quality of professional development opportunities statewide to identify particularly promising approaches and develop more effective mechanisms for sharing successful practices. States that have taken steps to add consistency and coherence to state-funded professional development have found significant positive benefits and synergy across their institutions and systems.

The Commonwealth should consider raising the certification requirements for CTE teachers to ensure consistency of teacher qualifications and highly qualified teachers across the system. These requirements have not been revised for some time. We recommend developing a legislative proposal to institute CTE teacher certification requirements that are as rigorous as those for other high school teachers, in both academic and technical areas.

Simply put, PDE can take numerous low-cost measures to help sending schools and regional career and technical institutions to deliver higher-quality CTE programming that meets state academic requirements and industry standards.

#### *Transparent Financing*

The financing of CTE in Pennsylvania is complex. For ACTESs that are multi-district, the lion's share of funding is generated through Articles of Agreement among sending districts that set the amount each district pays to the regional vocational school to serve its students. This funding is based primarily on the prior year's enrollment, as is the funding of single-district and high-school based programs. The per pupil support for CTE varies greatly, based in part on the property tax base in the sending communities, the cost structure of the ACTES facility (e.g., cafeteria or not; full gym facilities or not), and

other factors. Some regional schools have become quite adept at seeking grants and raising funds and in-kind support from government, industry, and charitable institutions. Only a small percentage of CTE funding—less than 5 percent—flows directly from state sources. This allocation is set by formula, which is in turn based largely on the prior year's enrollment.

Providing high-quality CTE can be more expensive than keeping a student at his/her home school full-time. Some ACTES agreements include mechanisms to reduce potential disincentives to send students to the ACTES so that the district retains more of its revenue. Some ACTES agreements cap sending schools' contribution so that there is no charge to the sending school for students above a target number. Other funding agreements have fixed and variable (per student) components. Some districts have found ways to mitigate short-term funding variation by using a three-year or five-year rolling average to calculate each sending school's contribution. We recommend a five-year rolling average for calculating sending districts' costs in order to minimize funding peaks and valleys that are attributable to annual swings in enrollment. PDE could provide some helpful leadership and assistance to districts and area schools in the renegotiation and management of their articles of agreement.

The issue of special needs funding deserves careful analysis. Several institutions we visited noted that extra funding that flows to the local sending school for services to special needs and disadvantaged students does not follow the student if he/she enrolls at the regional institution. Some adjustment in this regard is advisable: regional career and technology centers have a somewhat higher percentage of special needs students than their local counterparts (26 percent versus 15 percent is a reasonable guess).

An argument can be made that state funding of secondary CTE in Pennsylvania lags behind that of other states. As noted earlier, Pennsylvania CTE spending as a percentage of total K-12 funding from the state is about 1 percent, far lower than states like Texas where spending is over 5 percent. This is not, in itself, an argument for increasing state support, and any increase should be accompanied with clear responsibilities for improved performance. However, a small reallocation of base state subsidy for K-12 districts to CTE programming could yield a significant increase in resources available to CTE for only a small decrease in base support for each district. The governor and the legislature should address the pros and cons of such a shift in state funding. The Keystone Report suggested such a reassessment of the funding formula and needs of CTE by the legislature, but its proposal was never acted upon.

Ultimately, the unevenness in funding base for different CTE schools and programs has a lot to do with the funding of K-12 education across the Commonwealth, which depends heavily upon property taxes. Correction of some of the inequities that are quite visible across the CTE institutions and programs will rest with resolution of much broader and deeper challenges posed by K-12 funding sources and mechanisms in the Commonwealth.

The more transparent and well-informed the planning process, the better the decisions for individual students. Local districts and ACTEs need to develop stronger working relationships to ensure that students are guided toward programs best suited to their needs, regardless of where that education will occur.

### Innovation Grants

In a time of scarce resources, the Commonwealth and PDE have limited options for new programs and funding. While funding is limited, needs for CTE are quite large in some areas; state-of-the-art technology and equipment come with a hefty price tag. Toward the goal of improving the rigor and quality of CTE across Pennsylvania, the Innovative Learning Grants program should be expanded or a new innovation grant funding mechanism put in place. Such a program would provide competitive grants, *with significant local match*, to programs that seek to reach industry certification in a high-priority economic sector. Funds could be sought by schools unable to fund programs locally for equipment purchase, professional development, or other purposes, based on an application demonstrating need, academic and technical rigor, industry partnership, and other quality criteria.

### **8. Charge the Pennsylvania Department of Education with a much stronger leadership role and an increased role in quality control and program review.**

#### *Finding*

The Commonwealth, primarily through PDE, has not provided a strong or consistent voice about the role of career and technical education in a quality education. As a result, there is considerable confusion among parents, students, and school personnel about CTE's place and potential. PDE does not have the capacity to provide leadership and oversight, nor is PDE of one voice on CTE policy.

#### *Recommendations*

Governance of education in Pennsylvania is based on strong local control and decision-making. As such, a rigid state oversight and approval process is unlikely to be popular, nor is PDE likely to have the resources to implement a full-scale mechanism to assess and approve programs. That said, a state-level investment in quality improvement is essential to the Commonwealth's reform effort. PDE should reinvigorate its former state review process, promulgating quality criteria and a self-assessment guide that CTE programs are asked to follow. Study teams, led by PDE and joined by personnel from other CTE programs, would conduct site reviews of programs and provide feedback and recommendations for improvement. Programs would be scheduled for review on a regular basis; some reviews would be triggered based on issues and concerns raised by state or local officials. Maryland and New York policies and procedures provide examples that Pennsylvania might examine and modify for local use.

Pennsylvania needs a strong process for program approval, self-study, and oversight, with a focus on program improvement and the sharing of effective practices across the Commonwealth. Such a process can help ensure that CTE programs are of high quality, that standards are not lowered for CTE students, and that PSSA requirements and local labor needs are met. A program review process would provide the analytical support and wherewithal to motivate elimination of programs if necessary, as well as propel substantial structural change should major realignment be required.

Quality career and technical education is a viable pathway to postsecondary education and work. But stand-alone initiatives, including industry certification, do not necessarily

mean that CTE programs will be delivered in such a way that they produce qualified graduates in the technical field of study. There are many reasons for poor performance, ranging from lack of modernized equipment to inadequate teacher preparation and unequal distribution of resources to vocational schools. To build a system focused on accountability for results that links to overall educational goals of the Commonwealth, legislation should be developed to strengthen accountability for CTE outcomes, by defining success as enrollment into a postsecondary or job training program or entry into a career-related job, and requiring that these outcomes be tracked over time. In addition, the performance accountability system implemented by PDE should include a corrective action plan, a timeline for improvement, and eventual elimination of programs if performance is not improved.

Such action will help ensure that programs are performing at a level that produces the required outcomes for our young people to compete in today's economy, and that schools and districts are held accountable for these specific outcomes besides the process outcomes and inputs for which it now holds schools accountable.

Clearly, PDE does not possess the capacity as currently configured to staff a robust process for program approval and assistance. In the current budgetary context, additional staff cannot be the answer. Fortunately, PDE can make great strides in improving its capacity to drive and support program improvement through a combination of: creative partnering with key leaders and interests outside the department; redeployment of staff toward program approval and improvement strategies; and in-service professional development initiatives that strengthen staff capacity to add value to program improvement efforts at schools across the state.

By using a multi-sector approach that utilizes peer review, as well as input and participation from secondary, postsecondary (two- and four-year institutions), and employers, PDE could lead a review and assistance process that simultaneously bolsters quality, improves integration among sectors, and builds capacity across the system. In addition to pursuing accreditation and stronger state oversight, PDE should encourage education institutions (CTE and other high schools as well) to use a self-assessment process such as ISO registration (organization and operations), Middle States Commission Accreditation (best educational practices, also provided by PDE), or Malcolm Baldrige National Quality Award application for performance excellence.

Our review of Pennsylvania legislation pertaining to career and technical education indicates that it is quite dated and in need of revision to support the direction of CTE and broader education reform. While the code does not prevent the changes recommended here, neither does it strongly support them. Legislative action will be required to ensure that the CTE system is more accountable, better integrated, and focused on raising standards and expectations for all students.

Without stronger leadership from PDE—working with community leaders and partners in business and education—it will be difficult for struggling CTE programs to find their way. It is the role of the state to provide impetus to sending schools to build stronger relationships with CTE programs, identify funding problems, and advocate for better integrated and aligned elementary, secondary, postsecondary opportunities.

## Conclusion

From JFF's review of practice and policy in Pennsylvania and other states, it is clear that the Commonwealth can base program improvement upon a great deal of strong practice in secondary school reform and CTE. In a state as large and varied as Pennsylvania, CTE can provide a vital, viable option for a significant proportion of today's youth—but only if it is high quality and meets rigorous academic and technical standards. A number of area career and technology centers tell stories of turnarounds—from falling enrollment and declining local support to burgeoning enrollment, increased postsecondary enrollment, and vocal support from sending schools, employers, parents, and teachers. They have achieved those results because of an undaunted focus on student achievement for all students, the alignment of all parts of their schools to support that belief, and a willingness to make significant changes in staffing, program requirements and expectations, funding, and other basic aspects of operations. They have imagined a different future for CTE programs and students, and they have worked to make that vision a reality. They do not have to be the exceptions: by careful consideration of the recommendations made here and setting priorities for implementation and action, the Commonwealth can strengthen the secondary CTE system for the tens of thousands of students whose futures depend upon its quality and value.

## **Acknowledgments**

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## Resources

### **Site Visits**

Berks Career and Technology Center

Bucks County Technical High School

Central Pennsylvania Institute for  
Science and Technology

Lancaster County Career and  
Technology Center

Lehigh Career and Technical Institute

Lenape Technical High School

SUN Area Career and Technology  
Center

### **Interviews**

#### *Pennsylvania:*

Francis Barnes, Secretary of Education,  
Pennsylvania Department of Education

William Bartle, Director, Lehigh Valley  
Business Education Partnership

Ray Beichner, Chair, General Advisory  
Committee

John Bohn, Director, SUN Area CTC,  
and staff

Lee Burket, Acting Director, Bureau of  
Career and Technical Education,  
Pennsylvania Department of Education

Jim Buckheit, Executive Director,  
Pennsylvania State Board of Education

Jackie Cullen, Executive Director,  
Pennsylvania Association of Vocational  
Administrators

Michael Curley, Director, Lancaster  
County Career and Technology Center  
and staff

Edward Donley, Member, Vocational  
Education Committee, State Board of  
Education

David Fallinger, Project Director for  
Manufacturing Technology, Lehigh  
Carbon Community College

Peter Garland, Vice Chancellor,  
Pennsylvania State System of Higher  
Education

Thomas Gentzel, Executive Director,  
Pennsylvania School Boards  
Association

Samuel Gianne, Chair, Pennsylvania  
Partners

Karl Girton, Chairperson, State Board of  
Education

Kenneth Gray, Professor, Pennsylvania  
State University

Clyde Hornberger, Director, Lehigh  
Career and Technical Institute and staff

Edith Isacke, Member, State Board of  
Education, Chair, State Board  
Committee on Vocational Education

David John, Analyst, Legislative  
Planning and Analysis, Pennsylvania  
House of Representatives

Dawn Kocher Taylor, Director, Lenape  
Technical School, and staff

William Larkin, Deputy Secretary for  
Higher Education, Pennsylvania  
Department of Education

Michael Lawrence, Workforce  
Development Director, North Central  
Workforce Investment Board

Gregory Michelone, Director, Central  
Pennsylvania Institute for Science and  
Technology

Jim Panyard, Executive Director,  
Pennsylvania Manufacturers  
Association

Scott Parks, Director, Bucks County  
Technical High School

Robert Runkle, Director, Berks Career  
and Technology Center

Scott Sheely, Executive Director,  
Lancaster County Workforce Investment  
Board



*Other Interviews:*

Patrick Ainsworth, Director, Secondary, Postsecondary and Adult Leadership Division, California Department of Education

Robert Almond, Director of Career Technical Education, Virginia Department of Education

Kay Batcheler, Director of Career Technical Education, Texas Department of Education

Kim Green, Executive Director, National Association of State Directors of Career and Technical Education Consortium

Jo Kister, Education Consultant, High Schools That Work

Belinda McCharen, Assistant Director, Oklahoma Department of Career and Technology Education

Patricia McNeil, President, High School Solutions

Vicki Melvin, Director, Director of Career Technical Education, Ohio Department of Education

Kathy Oliver, Assistant State Superintendent, Division of Career Technology and Adult Learning, Maryland Department of Education, and staff

Conrad Raup, Assistant Director, Career and Technical Education, New York Department of Education

**Websites and Additional Sources**

*JFF consulted multiple sources from nationally known organizations with expertise in career and technical education policy and practice. Rather than citing these materials individually, we refer the reader to the publications of these organizations:*

American Youth Policy Forum

National Association of State Directors of Career and Technical Education Consortium

National Assessment of Vocational Education

National Centers for Research and Dissemination in Career and Technical Education

National Governors Association

Southern Regional Education Board/High Schools That Work

State Departments of Education, Career and Technical Education Divisions: California, Maine, Maryland, New York, North Carolina, Oklahoma, Ohio, Pennsylvania, Virginia

U.S. Department of Education, Office of Vocational and Adult Education

## References

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Keystone Commission. 2001. *Preparing Students for the Workforce; Final Report of the Keystone Commission on Education and Employment in the 21<sup>st</sup> Century*. Harrisburg: Keystone Commission.

Klein, Steven, Corey Zimmerman and Gary Hoachlander. 2001. *Funding Career/Technical Education*. Atlanta: Southern Regional Education Board.

Pennsylvania Department of Education. 2004. *Career and Technical Education: Secondary Programs 2002-03*. Harrisburg: PDE.

Pennsylvania Department of Education. 2004. *Pennsylvania Secondary Career and Technical Education Reports*. web-based reports at [www.catsreports.ed.state.pa.us](http://www.catsreports.ed.state.pa.us).

## Endnotes

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<sup>1</sup> The Pennsylvania data and collection system appears to be highly fractured regarding CTE enrollment and performance. In particular, CTE enrollment is not presented relative to the larger secondary student population, nor is it possible to aggregate performance statewide and compare those in CTE programs to their counterparts in other parts of the secondary system. This thinking of CTE as a separate enterprise is manifest in data collection, governance, policy, and program.

<sup>2</sup> The area career and technical education schools were formerly referred to as area vocational-technical schools and are currently known as Career and Technical or Technology Centers.

<sup>3</sup> For detailed information about 2002-03 enrollment, program approval, and other pertinent data about ACTES programs and students, see PDE's *Pennsylvania Area Career and Technical Education Schools, 2004 Report*.

<sup>4</sup> In prior years, this proposal has been part of an effort to grant ACTESs technical institute status, as is provided for in state statute. To avoid confusion with prior proposals and ensure that the specific nature of the change in ACTES status is clear, we recommend not using the term technical institute but rather focusing on the substantive change that allows ACTESs to grant postsecondary credit, where programs are determined to have a high enough level and quality to warrant postsecondary status.