

# **21<sup>st</sup> Century Learning**

**Career and Technical Education Prepares  
New York City Students for Future Success**

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# Office of the New York City Public Advocate

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## SUMMARY

Career and Technical Education, or “CTE,” is a term used to describe a variety of educational initiatives occurring in a broad range of settings, from middle schools to community colleges and private technical schools. Though the CTE label has been applied in many different contexts, there is a growing effort to standardize the definition as it applies to programs in public high schools. Federal funding guidelines for CTE programs are playing a significant role in determining which programs should fall under the heading of career education.

The New York City Department of Education (DOE) recognizes nearly 500 career-oriented programs in high schools throughout the city and lists them all as Career and Technical Education on its CTE website. However, only 54 of the programs – approximately 11 percent – have been reviewed and approved by the New York State Education Department (NYSED).<sup>1</sup> The state approval process helps to ensure that programs bearing the CTE label meet federal standards for best practices in career education. The Office of the New York City Public Advocate recommends that the DOE develop existing CTE programs in high-demand career areas and submit those programs for review and approval by NYSED.

## BACKGROUND

Career and Technical Education programs have been established in approximately 11,000 comprehensive high schools throughout the country. In addition, approximately 9,400 post-secondary institutions are now offering coursework in technical careers.<sup>2</sup> Though definitions vary from state to state and from school district to school district, advocates of career and technical education in high schools tend to agree that CTE programs should:

- Integrate academic learning with technical learning across the curriculum;
- Maintain high academic standards for all students;
- Be taught by certified teachers with technical or career experience;
- Prepare students to earn an industry-based credential or certificate upon graduation;
- Focus on careers in growing or emerging industries;
- Provide students with internship- or work-based learning opportunities; and
- Allow students to earn college credit for college-level courses taken in high school.

### *CTE Programs Improve Academic Achievement*

CTE programs help students develop technical and work-based skills while simultaneously ensuring high academic achievement rates. Students surveyed in California indicated that they would be more interested in academic coursework if it were linked to a CTE program.<sup>3</sup> In New York City, students graduating from state-approved CTE programs enroll in post-secondary education programs at high rates despite having the credentials to enter directly into jobs with promising opportunities for advancement.

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<sup>1</sup> Based on a tally of state-approved CTE programs still in operation during the 2004-2005 school year.

<sup>2</sup> Association for Career and Technical Education (ACTE), *Frequently Asked Questions*, [www.acteonline.org/career\\_tech/faq.cfm](http://www.acteonline.org/career_tech/faq.cfm).

<sup>3</sup> Peter D. Hart Research Associates, Inc., *Report Findings Based on a Survey Among California Ninth and Tenth Graders*, April 5, 2006.

In most high schools, CTE has replaced an outdated “vocational education” approach to technical learning. The old model segregated career and technical preparation from academic coursework and was often used to track academically challenged students out of the

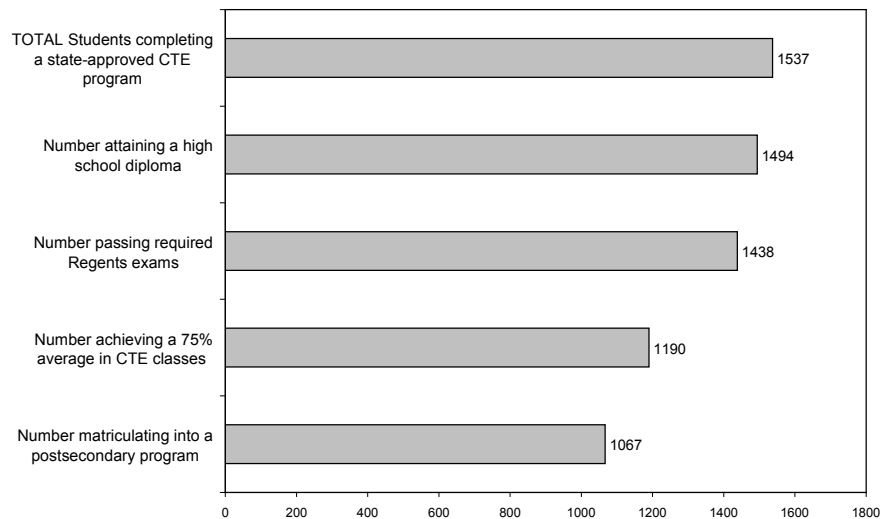
*“Career and Technical Education engages all students in a dynamic and seamless experience resulting in their mastery of the career and academic knowledge and skills necessary to become productive contributing members of society.”*

California Institute on Human Services

general high school population. While their peers were taught English, math, science, and social studies, vocational education students were mainly confined to technical courses that prepared them for relatively low paying careers.<sup>4</sup> In contrast, CTE emphasizes high academic standards for all career-oriented students. For example, in 2005, 97 percent of 12th grade students enrolled in one of 48 state-approved CTE programs in New York City attained a high school diploma (see Table One).<sup>5</sup>

Unlike the vocational education model from the past, CTE is preparing students for both work *and* advanced learning. Sixty-nine percent of local CTE students graduating in 2005 chose to

**Table One: Profile of Program Completers in State-Approved CTE programs (2004-2005)**



\*Data only available for 48 out of 54 state-approved CTE programs during the 2004-2005 academic year.

**Sources:** New York City Department of Education, (NYC DOE) *Summary Findings of 42 State Approved Programs in Career and Technical Education (CTE) and the Number of Graduates in the Success Via Apprenticeship (SVA) Program*, October 11, 2006; NYC DOE, *Current Status of the DOE's Career and Technical Education Programs in Health Care*, August 22, 2006.

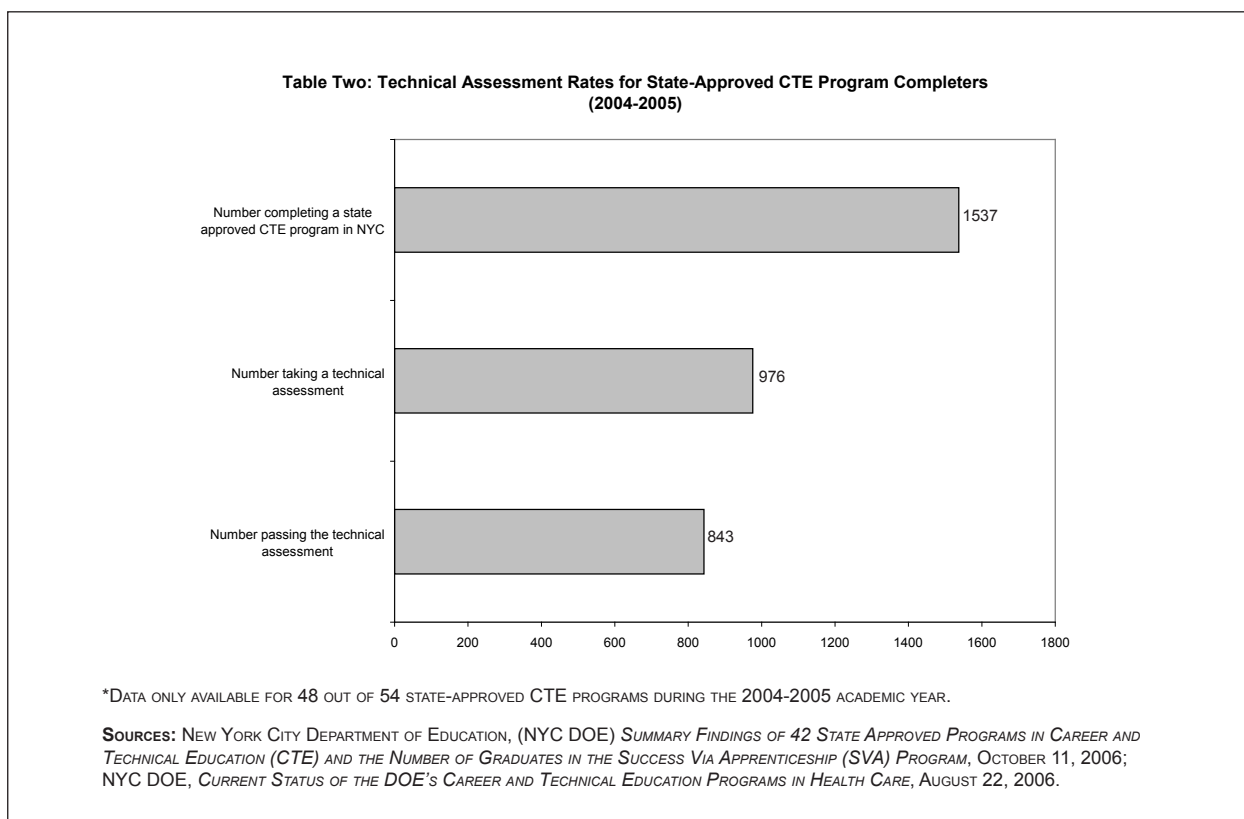
<sup>4</sup> Landberg, Mitchell, “Struggling Students Want Vocational Education, Poll Shows,” April 6, 2006, [www.latimes.com/news/local/la-me-voced6apr06,1,1209508.story?ctrack=1&cset=true](http://www.latimes.com/news/local/la-me-voced6apr06,1,1209508.story?ctrack=1&cset=true).

<sup>5</sup> Based on data available for 48 of the 54 state-approved CTE programs in New York City high schools during the 2004-2005 school year.

enroll in a post-secondary program.<sup>6</sup> Indeed, nationwide, “nearly two thirds of all high school graduates of [CTE] programs enter some form of postsecondary education.”<sup>7</sup>

*CTE Prepares Students For the Job Markets*

CTE starts from the premise that all students stand to benefit from career-oriented coursework. According to a recent study of manufacturing businesses, 69 percent of firms cite “inadequate basic employability skills such as attendance, timeliness, and work ethic as the most common reason for rejecting job applicants.”<sup>8</sup> Of the employers surveyed in a similar study, 40 percent reported that applicants are often poorly skilled. Thirty percent said that applicants simply had the wrong skills for available jobs.<sup>9</sup> In New York City, health care employers are experiencing a chronic shortage of skilled diagnostic technicians and care providers and these employers have indicated that local high school graduates lack the skills necessary to fill the gap.<sup>10</sup> Students who



<sup>6</sup> New York City Department of Education, (NYC DOE) *Summary Findings of 42 State Approved Programs in Career and Technical Education (CTE) and the Number of Graduates in the Success Via Apprenticeship (SVA) Program*, October 11, 2006; NYC DOE, *Current Status of the DOE’s Career and Technical Education Programs in Health Care*, August 22, 2006.

<sup>7</sup> ACTE, *Frequently Asked Questions*, [www.acteonline.org/career\\_tech/faq.cfm](http://www.acteonline.org/career_tech/faq.cfm).

<sup>8</sup> Cable News Network (CNN), “Hire Education: A Vocational Model Succeeds,” March 7 2007, [www.cnn.com/2007/education/03/07/cec.career.tech/index.html](http://www.cnn.com/2007/education/03/07/cec.career.tech/index.html).

<sup>9</sup> ACTE, *What Is Career and Technical Education?*, [www.acteonline.org/career\\_tech/upload/CTUFactSheet.doc](http://www.acteonline.org/career_tech/upload/CTUFactSheet.doc).

<sup>10</sup> Office of the New York City Public Advocate, *Help Wanted: Department of Education Misses Opportunities to Connect Students With Health Care Careers*, November 2006.

graduate from CTE programs having developed these basic work skills will likely be in high demand.

More than half of New York City CTE students graduating from a state-approved CTE program in 2005 earned a passing grade on an industry-approved technical assessment (see Table Two)<sup>11</sup>. Most of the city's state-approved CTE programs are in sectors that are expected to experience high growth rates over the next seven years, according to the New York State Department of Labor (see appendix C).<sup>12</sup> For example, students graduating from one of two state-approved CTE programs in Carpentry are eligible to take a technical proficiency exam administered by The National Center for Construction Education and Research (NCCER). According to the DOL, carpentry will experience "very favorable" job growth through 2014, with median annual wages over \$50,000.<sup>13</sup>

### *Students Want a "Real-World" Context for Learning*

In a recent survey of ninth and tenth graders in California, researchers found that most students would enroll in CTE courses if given the opportunity. Students were read the following description of a CTE school and then asked to respond to questions:

"In some places in California, students are offered the chance to attend local public high schools and charter schools where the academic work is more closely tied to preparing students for jobs and careers. In these schools, students take the courses they need for college, but also acquire skills and knowledge that are relevant to success in the work place. For example, in one district, there is a health sciences academy where students can earn both a high school diploma and a certificate that qualifies them to get good-paying health care jobs. The kinds of schools I am talking about place a greater emphasis on teaching academic subjects in ways that are more relevant to the real world workplace – such as tying history courses to law and government or tying science courses to health care and robotics."<sup>14</sup>

Seventy-three percent of students polled indicated, "the idea of a school where academic work is more closely tied to preparing students for college and careers is highly appealing."<sup>15</sup> Similarly, 91 percent of students in the poll said, "they would be more motivated to work hard and do well if they attended this kind of school."<sup>16</sup>

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<sup>11</sup> Technical assessments are defined in the NYS Commissioner of Education Regulations as "an industry-developed assessment consisting of written examination(s), student project(s) and student demonstration(s) of technical skills to measure proficiency in a specific technical field through the application of national standards in such technical field." NYSED, *Technical Assessments Based on Industry Standards*, [www.emsc.nysed.gov/cte/ctepolicy/CTEGuide-technical\\_assessments2006.htm](http://www.emsc.nysed.gov/cte/ctepolicy/CTEGuide-technical_assessments2006.htm).

<sup>12</sup> New York State Department of Labor (NYS DOL), *Employment Prospects To 2014*, [www.labor.state.ny.us/workforceindustrydata/apps.asp?reg=nys&app=descriptor](http://www.labor.state.ny.us/workforceindustrydata/apps.asp?reg=nys&app=descriptor).

<sup>13</sup> *Ibid.*

<sup>14</sup> Peter D. Hart Research Associates, Inc., *Report Findings Based on a Survey Among California Ninth and Tenth Graders*, April 5, 2006.

<sup>15</sup> *Ibid.*

<sup>16</sup> *Ibid.*

## STANDARDS FOR CAREER AND TECHNICAL EDUCATION

Federal guidelines<sup>17</sup> require that CTE programs be no less academically rigorous than any other high school experience. Career and technical educators in California have stated, “the new CTE concept moves away from a narrow technical curriculum that teaches tools and techniques to a broad curriculum that encompasses both academic and technical skills.”<sup>18</sup>

In late 2006, President George W. Bush signed the Carl D. Perkins Career and Technical Education Improvement Act into law. The Perkins Act sets standards and governs the distribution of billions of dollars in federal aid for CTE programs. Under the Perkins Act, CTE is defined as a sequence of courses that:

- Align technical learning with academic content;
- Provide students with the skills and knowledge necessary for achieving an industry-recognized credential or certificate; and
- Develop “problem solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills...”<sup>19</sup>

The law also establishes guidelines for creating links between high school CTE programs and post-secondary programs.

In New York State, district-based CTE programs can choose to undergo a rigorous review process overseen by NYSED. The process, which results in formal state approval for a CTE program, ensures that programs meet state standards and the objectives described in the Perkins Act. State standards for approved CTE programs stipulate that:

- All CTE teachers be professionally certified in the topic area they teach;
- Work based learning opportunities, such as internships, be part of the CTE curriculum;
- The CTE curriculum prepares students to pass a technical assessment;
- Steps are taken to develop courses that integrate academic and CTE topics; and
- Integrated courses are co-developed by academic and CTE teachers.<sup>20</sup>

The process begins with an internal self-review on the part of the CTE program, which is followed by a pre-review by the school district. Once district administrators have signed off on the self-review, it is sent to NYSED for further scrutiny. Though state approval is optional, it is one of the few guarantees available to parents and students that a CTE program meets standards and expectations.

In keeping with the Perkins guidelines and best practices found in CTE programs throughout the country, the New York City DOE describes a successful CTE program as including:

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<sup>17</sup> US Congress, *An Act to Amend the Carl D. Perkins Vocational and Technical Education Act of 1998 to Improve the Act*, January 3, 2006.

<sup>18</sup> California Institute On Human Services, *Guiding Documents*, [www.sonoma.edu/cihs/cte/guiding.html](http://www.sonoma.edu/cihs/cte/guiding.html).

<sup>19</sup> US Congress, *An Act to Amend the Carl D. Perkins Vocational and Technical Education Act of 1998 to Improve the Act*, January 3, 2006.

<sup>20</sup> New York State Education Department (NYSED), *Teacher Certification/Training*, [www.emsc.nysed.gov/cte/ctepolicy/docs/CTEguideteachercertificationtraining2004.doc](http://www.emsc.nysed.gov/cte/ctepolicy/docs/CTEguideteachercertificationtraining2004.doc); NYSED, *Curriculum Review*, [www.emsc.nysed.gov/cte/ctepolicy/docs/CTEguidecurriculumreview2004.doc](http://www.emsc.nysed.gov/cte/ctepolicy/docs/CTEguidecurriculumreview2004.doc).

- Certified teachers who have kept up-to-date with their profession;
- A course sequence that prepares students for employment or a post-secondary program;
- An internship or work-based learning opportunity;
- An opportunity to earn college credit for classes at the post-secondary level;
- The opportunity to take industry-based certification exams upon graduating; and
- The opportunity to use up-to-date industry technologies.<sup>21</sup>

**Yet only 54 of the 493 CTE programs listed on the DOE’s CTE website have gone through the state review and approval process that would guarantee compliance with these guidelines.**<sup>22</sup> Students enrolled in non-approved CTE programs may not have access to the same quality of career and technical training as the 8,622 students in programs that have been approved by the state (see Appendix A). Moreover, 8th grade students and their parents may not be aware of this distinction when selecting high schools with CTE programs. The DOE’s CTE website fails to clearly differentiate between state-approved programs and other programs that may not be as rigorous or meet the standards described above.

## **CONCLUSION AND RECOMMENDATIONS**

New York City high school students completing a state-approved CTE program have an academic and professional advantage over many of their peers in standard high school programs. 94 percent of 12th graders in state-approved CTE programs in 2005 achieved a passing grade on required Regents exams (see Table One). 97 percent were awarded a high school diploma (see Table One), and more than half passed an industry-based technical assessment granting them a certificate or credential in a competitive field (see Table Two).

Given the positive outcomes resulting from enrollment in CTE programs that meet state and federal standards, the Office of the Public Advocate makes the following recommendations:

### **Bring more non-approved CTE programs up to state standards.**

- Identify existing non-approved CTE programs in career sectors that the New York State Department of Labor forecasts as having “very favorable” employment trends through to 2014, such as:
  - Medical Technology
  - Dental Assistants
  - Emergency Medical Technology
  - Medical Billing and Coding
  - Electrical Installation
  - Carpentry
  - CISCO Network Academy
  - Computer Program Languages

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<sup>21</sup> NYC DOE, *Career and Technical Education: Programs*, [www.nyccte.com/nycctenew/programs.asp](http://www.nyccte.com/nycctenew/programs.asp).

<sup>22</sup> *Ibid.*



- Automotive Technology<sup>23</sup>
- Invest in the staff, technology, and curriculum development necessary to submit non-approved CTE programs for state review and approval.
- Maintain detailed records of steps taken to bring non-approved CTE programs up to state standards in preparation for the “self-study” portion of the state review process for program approval.

**Submit eligible CTE programs for state review and approval.**

- Once selected programs meet state standards and reflect best practices found in other CTE programs, submit them for state review and approval.

**Differentiate between approved and non-approved CTE programs.**

- Clearly differentiate state-approved CTE programs from other career-based programs in all DOE materials, including the annual guide for high school selection and the DOE website so that students and parents can make informed decisions.

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<sup>23</sup> Examples are based on non-state-approved CTE program titles listed on the DOE website that match DOL “very favorable” or “favorable” job favorability ratings through 2014. NYC DOE, *Career and Technical Education: Programs*, [www.nyccte.com/nycctenew/programs.asp](http://www.nyccte.com/nycctenew/programs.asp); New York State Department of Labor, *Employment Prospects To 2014 Employment Prospects To 2014*, [www.labor.state.ny.us/workforceindustrydata/apps.asp?reg=nys&app=descriptor](http://www.labor.state.ny.us/workforceindustrydata/apps.asp?reg=nys&app=descriptor).

## APPENDIX A:

### Detailed profile of program completers in state-approved CTE programs (2004-2005)

	School	CTE Program	Total Program Enrollment	Number of Completers (2004-2005)	Number that Passed Required Regents (2004-2005)	Number that achieved a 75% average in CTE classes (2004-2005)	Number attaining a High School Diploma (2004-2005)	Number enrolling in Postsecondary Institution (2004-2005)
1	Alfred E. Smith	Carpentry	171	16	14	5	16	6
2		Electrical	134	17	17	13	17	6
3		Plumbing	104	11	11	2	11	2
4		NATEF/Automotive Technology	536	33	33	26	33	20
5		Heating, Air Conditioning, and Refrigeration	State Endorsement Received After 2004-2005 School Year					
6	Automotive HS	Automotive Technology	663	45	39	14	45	30
7	Aviation	Aviation Maintenance Technology	1,817	217	186	217	217	185
8	Canarsie	Nurse Assistant	155	13	13	11	13	13
9	Chelsea	Business Information/Technology	342	114	114	82	97	86
10	Clara Barton High School	Practical Nursing	40	27	27	27	27	20
11		Nurse Assistant	52	16	16	15	16	8
12		Dental Assistant	27	18	18	18	18	13
13	Curtis HS	Nurse Assistant	85	27	27	19	27	4
14		Practical Nursing	44	14	14	14	14	7
15	Dewitt Clinton High School	Nurse Assistant	40	42	42	42	42	42
16	East NY Transit Tech	Industrial Electrician Electrical Installation	43	31	21	22	30	23
17		Transit Technician	72	49	40	27	40	31
18	Far Rockaway High School	Nurse Assistant	86	15	15	15	15	11
19	Fashion Industries	Graphics/Illustration	301	58	57	47	58	58
20	Franklin K. Lane High School	Vision Technology	31	23	23	20	23	20
21	George Westinghouse	A+ Computer Repair & Maintenance	18	9	4	-	4	3
22		Vision Technology	49	13	13	1	13	9
23	Grace Dodge	Academy of Finance(AOF)	37	20	20	20	20	17
24		Nurse Assistant	20	20	20	12	20	15
25	Hillcrest High School	Practical Nursing	25	16	10	16	16	16
26	HS of Graphic Communication Arts	Commercial Photography	178	26	26	19	26	23
27		Commercial Art Production	381	45	45	32	45	35
28	Jane Addams	Academy of Travel & Tourism (AOTT)	163	48	48	33	48	31
29		Nurse Assistant	317	56	56	20	56	36
30	Lafayette	Nurse Assistant	220	52	52	52	52	52
31	Long Island City	Culinary Arts	211	26	21	26	26	21
32	Park West	Culinary Arts	0	60	60	53	60	-
33	Queens Vocational and Technical Education High School	Plumbing	59	9	9	5	9	2
34		Cosmetology	274	9	9	5	9	2
35		A+ Computer Repair	State Endorsement Received After 2004-2005 School Year					
36	Ralph McKee	Construction Technology/ Carpentry	76	10	10	10	10	2
37		CISCO	66	14	12	10	12	5
38	Samuel Gompers	Electronic Technician (A+) Certification	456	76	62	71	73	-
39		Computer Aided Design	194	16	14	11	16	9
40	Talent Unlimited	CTE Drama Curriculum	140	17	17	16	17	17

	School	CTE Program	Total Program Enrollment	Number of Completers (2004-2005)	Number that Passed Required Regents (2004-2005)	Number that achieved a 75% average in CTE classes (2004-2005)	Number attaining a High School Diploma (2004-2005)	Number enrolling in Postsecondary Institution (2004-2005)
41	Thomas Edison	MOS	110	42	36	24	36	36
42		A+ Computer Repair	154	55	55	33	55	55
43		CISCO, Networking Academy	84	78	78	61	78	78
44	Tottenville	Culinary Arts	123	-	-	-	-	-
45	William E. Grady	Building and Construction Trades/Construction Technology	115	5	5	5	5	
46		HVAC	70	6	6	4	6	4
47	William H. Maxwell High School	Vision Technology	63	11	11	9	11	10
48		Cosmetology	276	12	12	6	12	4
49	School of Cooperative Technical Education	Culinary Arts	State Endorsement Received After 2004-2005 School Year					
50		Carpentry						
51		Automotive Technology						
52	Brooklyn High School of the Arts	Preservation Arts	State Endorsement Received After 2004-2005 School Year					
53	Norman Thomas High School	Accounting	State Endorsement Received After 2004-2005 School Year					
54	Walton High School	Entrepreneurship/Virtual Enterprise	State Endorsement Received After 2004-2005 School Year					
		<b>TOTAL</b>	8622	1537	1438	1190	1494	1067
		<b>PERCENT</b>			94%	77%	97%	69%

**Sources:** New York City Department of Education, (NYC DOE) *Summary Findings of 42 State Approved Programs in Career and Technical Education (CTE) and the Number of Graduates in the Success Via Apprenticeship (SVA) Program*, October 11, 2006; NYC DOE, *Current Status of the DOE's Career and Technical Education Programs in Health Care*, August 22, 2006.

## APPENDIX B:

### Detailed technical assessment rates for state-approved CTE program completers (2004-2005)

	School	CTE Program	Technical Assessment	Number Taking Technical Assessment	Number Passing Technical Assessment in FY05	Number of Technical Endorsed Diplomas
1	Alfred E. Smith	Carpentry	NCCER Electrical Exam, NCCER Carpentry Exam	16	16	16
2		Electrical	NCCER Electrical Exam	17	17	17
3		Plumbing	NCCER Plumbing Exam	11	11	11
4		NATEF/Automotive Technology	NATEF Exams	32	32	32
		Heating, Air Conditioning, and Refrigeration	State Endorsement Received After 2004-2005 School Year			
5	Automotive HS	Automotive Technology	NATEF Exams	-	-	-
6	Aviation	Aviation Maintenance Technology	FAA License for Air Frame Mechanic Exam	181	172	172
7	Canarsie	Nurse Assistant	State Certified Nurse Assistant Exam	13	6	6
8	Chelsea	Business Information/Technology	MOS Certification and C-Tech Network Cabling Exams	60	47	47
9	Clara Barton High School	Practical Nursing	Comprehensive LPN Predictor Exam by ATI	27	27	0
10		Nurse Assistant	State Certified Nurse Assistant Exam	15	12	0
11		Dental Assistant	State Certified Nurse Assistant Exam	17	17	0
12	Curtis HS	Nurse Assistant	State Certified Nurse Assistant Exam	0	0	0
13		Practical Nursing	Comprehensive LPN Predictor Exam by ATI	13	10	10
14	Dewitt Clinton High School	Nurse Assistant	State Certified Nurse Assistant Exam	41	39	39
15	East NY Transit Tech	Industrial Electrician Electrical Installation	Regent Shop Comprehensive Exam with Regent Approval to Update Yearly – Building Trades Local	31	28	28
16		Transit Technician	Building Trades Local Exam	49	44	44
17	Far Rockaway High School	Nurse Assistant	State Certified Nurse Assistant Exam	15	7	7
18	Fashion Industries	Graphics/Illustration	Arts Regents Exam	48	48	48
19	Franklin K. Lane High School	Vision Technology	New York City College of Technology and Optical Association Exam	7	4	4
20	George Westinghouse	A+ Computer Repair & Maintenance	CompTIA A+ Computer Repair Exam	4	1	0
21		Vision Technology	New York City College of Technology and Optical Association Exam	13	6	6
22	Grace Dodge	Academy of Finance(AOF)	NAF Academy of Finance Exam	20	20	20
23		Nurse Assistant	State Certified Nurse Assistant Exam	19	17	17
24	Hillcrest High School	Practical Nursing	Comprehensive LPN Predictor Exam by ATI	16	16	16
25	HS of Graphic Communication Arts	Commercial Photography	The Advertising Photographers of America developed and approved the Commercial Photography Exam	-	-	-
26		Commercial Art Production	Angen Services (Graphic Design Company) and AGC developed and approved the Commercial Art Exam	-	-	-
27	Jane Addams	Academy of Travel & Tourism (AOTT)	NAF Academy of Travel and Tourism Exam	48	48	33
28		Nurse Assistant	State Certified Nurse Assistant Exam	31	27	27
29	Lafayette	Nurse Assistant	State Certified Nurse Assistant Exam	10	7	0
30	Long Island City	Culinary Arts	C-CAP Exam	26	17	17
31	Park West	Culinary Arts	Pro-Start Exam	0	0	0
32	Queens Vocational and Technical Education High School	Plumbing	NCCER Plumbing Exam	9	9	9
33		Cosmetology	NOCTI Cosmetology Exam	9	9	9
		A+ Computer Repair	State Endorsement Received After 2004-2005 School Year			
34	Ralph McKee	Construction Technology/Carpentry	NCCER Carpentry Exam	10	7	7
35		CISCO	Cisco CNNA Exam	14	12	12
36	Samuel Gompers	Electronic Technician (A+) Certification	Comptia A+ Computer Repair Exam	16	2	2
37		Computer Aided Design	NOCTI CADD Exam	15	-	-

	School	CTE Program	Technical Assessment	Number Taking Technical Assessment	Number Passing Technical Assessment in FY05	Number of Technical Endorsed Diplomas
38	Talent Unlimited	CTE Drama Curriculum	Exit Exam prepared by Epic Theatre Company, New York University Theater Program and Mary Mount College	17	17	17
39	Thomas Edison	MOS	MOS Exam	29	28	28
40		A+ Computer Repair	A+ Computer Repair Exam	18	17	17
41		CISCO, Networking Academy	Cisco CNNA Exam,	25	23	23
42	Tottenville	Culinary Arts	C-CAP Exam	0	0	0
43	William E. Grady	Building and Construction Trades/ Construction Technology	NCCER Carpentry and Plumbing Exams	5	5	5
44		HVAC	NCCER HVAC Exam	6	4	4
45	William H. Maxwell High School	Vision Technology	New York City College of Technology and Optical Association Exam	11	7	7
46		Cosmetology	NOCTI Cosmetology Exam	12	7	7
47	School of Cooperative Technical Education	Culinary Arts	State Endorsement Received After 2004-2005 School Year			
48		Carpentry				
49		Automotive Technology				
50	Brooklyn High School of the Arts	Preservation Arts	State Endorsement Received After 2004-2005 School Year			
51	Norman Thomas High School	Accounting	State Endorsement Received After 2004-2005 School Year			
52	Walton High School	Entrepreneurship/Virtual Enterprise	State Endorsement Received After 2004-2005 School Year			
			Total	976	843	764

**Sources:** New York City Department of Education, (NYC DOE) *Summary Findings of 42 State Approved Programs in Career and Technical Education (CTE) and the Number of Graduates in the Success Via Apprenticeship (SVA) Program*, October 11, 2006; NYC DOE, *Current Status of the DOE's Career and Technical Education Programs in Health Care*, August 22, 2006.

## APPENDIX C:

### NYS DOL employment projections for matching state-approved CTE programs

State-Approved CTE Program	High Schools Offering Program	DOL Matching Field	DOL Favorability Rating	DOL Median Annual Wage
Microsoft Office Specialist	• Thomas A. Edison Career and Technical Education High School	Desktop Publishers	Favorable	\$48,450
A+ Computer Repair	• Thomas A. Edison Career and Technical Education High School • Queens Vocational and Technical Education high School	Computer Support Specialists	Very Favorable	\$47,250
CISCO, Networking Academy	• Thomas A. Edison Career and Technical Education High School • Ralph R. McKee Career and Technical High School	Network and Computer Systems Administrators	Very Favorable	\$81,620
Commercial Art Production	• High School of Graphic Communication Arts	Commercial and Industrial Designers	Favorable	\$53,700
Industrial Electrician Electrical Installation	• Transit Tech Career and Technical Education High School	Electrician	Very Favorable	\$67,670
Electronic Technician (A+) Certification	• Samuel Gompers Career and Technical Education High School	Electrical and Electronics Repairers, Commercial and Industrial Equipment	Favorable	\$44,710
Aviation Maintenance Technology	• Aviation Career and Technical Education High School	Aircraft Mechanics and Service Technicians	Favorable	\$52,920
NATEF/Automotive Technology	• Alfred E. Smith Career and Technical Education High School	Automotive Service Technicians and Mechanics	Very Favorable	\$32,430
Automotive Technology	• Automotive High School School of Co-Op Technical Education	Automotive Service Technicians and Mechanics	Very Favorable	\$32,430
A+ Computer Repair & Maintenance	• George Westinghouse Career and Technical Education High School	Computer, Automated Teller, and Office Machine Repairers	Least Favorable	\$45,970
Business Information/Technology	• Chelsea Career and Technical Education High School	Business Operations Specialists, all others	Very Favorable	\$64,270
Cosmetology	• W.H. Maxwell Career and Technical Education High School • Queens Vocational and Technical Education high School	Hairdressers, Hairstylists, and Cosmetologists	Very Favorable	\$24,530
Graphics/Illustration	• The High School of Fashion Industries	Graphic Designers	Very Favorable	\$57,430
Academy of Travel & Tourism (AOTT)	• Jane Adams High School for Academic Careers	Lodging Managers	Favorable	\$57,160
Academy of Finance (AOF)	• Grace Dodge Career and Technical Education High School	Financial Analysts	Very Favorable	\$80,760
Building and Construction Trades/Construction Technology	• William E. Grady Career and Technical Education High School	Construction Laborers	Very Favorable	\$37,680
Heating, Ventilation, and Air Conditioning	• William E. Grady Career and Technical Education High School	Heating, Air Conditioning, and Refrigeration Mechanics Installers	Favorable	\$50,200

State-Approved CTE Program	High Schools Offering Program	DOL Matching Field	DOL Favorability Rating	DOL Median Annual Wage
Plumbing	<ul style="list-style-type: none"> <li>Queens Vocational and Technical Education high School</li> <li>Alfred E. Smith Career and Technical Education High School</li> </ul>	Plumbers, Pipefitters, and Steamfitters	Very Favorable	\$63,650
Carpentry	<ul style="list-style-type: none"> <li>Alfred E. Smith Career and Technical Education High School</li> <li>School of Co-Op Technical Education</li> </ul>	Carpenters	Very Favorable	\$50,290
Electrical	<ul style="list-style-type: none"> <li>Alfred E. Smith Career and Technical Education High School</li> </ul>	Electrician	Very Favorable	\$67,670
Construction Technology/Carpentry	<ul style="list-style-type: none"> <li>Ralph R. McKee Career and Technical High School</li> </ul>	Carpenters	Very Favorable	\$50,290
Culinary Arts	<ul style="list-style-type: none"> <li>Tottenville High School</li> <li>Long Island High School</li> <li>School of Co-Op Technical Education</li> </ul>	Chefs and Head Cooks	Very Favorable	\$41,840
CTE Drama Curriculum	<ul style="list-style-type: none"> <li>Talent Unlimited High School</li> </ul>	Producers and Directors	Favorable	\$82,110
Commercial Photography	<ul style="list-style-type: none"> <li>High School of Graphic Communication Arts</li> </ul>	Photographers	Favorable	\$34,870
Transit Technician	<ul style="list-style-type: none"> <li>Transit Tech Career and Technical Education High School</li> </ul>	Transportation Workers, All Others	Favorable	\$36,950
Computer Aided Design	<ul style="list-style-type: none"> <li>Samuel Gompers Career and Technical Education High School</li> </ul>	Designers, All Others	Favorable	\$44,551
Preservation Arts	<ul style="list-style-type: none"> <li>Brooklyn High School of the Arts</li> </ul>	Installation, Maintenance, and Repair Workers, All Others	Favorable	\$33,300
Welding	<ul style="list-style-type: none"> <li>School of Co-Op Technical Education</li> </ul>	Welders, Cutters, Solderers and Brazers	Least Favorable	\$31,300
Heating, Air Conditioning and Refrigeration	<ul style="list-style-type: none"> <li>Alfred E. Smith Career and Technical Education High School</li> </ul>	Heating, Air Conditioning, and Refrigeration Mechanics Installers	Favorable	\$50,200
Accounting	<ul style="list-style-type: none"> <li>Norman Thomas High School</li> </ul>	Accountants and Auditors	Very Favorable	\$68,190
Entrepreneurship/Virtual Enterprise	<ul style="list-style-type: none"> <li>Walton high School</li> </ul>	no data	no data	no data
Nurse Assistant	<ul style="list-style-type: none"> <li>DeWitt Clinton High School</li> <li>Grace Dodge High School</li> <li>Jane Adams High School for Academic Careers</li> <li>Far Rockaway High School</li> <li>Canarsie High School</li> <li>Clara Barton High School</li> <li>Curtis High School</li> <li>Lafayette High School</li> </ul>	Nursing Aides, Orderlies, & Attendants	Very Favorable	\$32,030
Dental Assistant	<ul style="list-style-type: none"> <li>Clara Barton High School</li> </ul>	Dental Assistant	Very Favorable	\$33,060

State-Approved CTE Program	High Schools Offering Program	DOL Matching Field	DOL Favorability Rating	DOL Median Annual Wage
Practical Nursing	<ul style="list-style-type: none"> <li>• Hillcrest High School</li> <li>• Clara Barton High School</li> <li>• Curtis High School</li> </ul>	Licensed Practical and Licensed Vocational Nurses	Very Favorable	\$42,200
Vision Technology	<ul style="list-style-type: none"> <li>• William H. Maxwell High School</li> <li>• Franklin K. Lane High School</li> <li>• George Westinghouse High School</li> </ul>	Opticians, Dispensing	Favorable	\$43,330

**Sources:** NYC DOE, *Career and Technical Education: Programs*, [www.nyccte.com/nycctenew/programs.asp](http://www.nyccte.com/nycctenew/programs.asp); New York State Department of Labor, *Employment Prospects To 2014*, [www.labor.state.ny.us/workforceindustrydata/apps.asp?reg=nys&app=descriptor](http://www.labor.state.ny.us/workforceindustrydata/apps.asp?reg=nys&app=descriptor).



