Manufacturing Skills for Connecticut:

Review of Waterbury Career Academy's Manufacturing Academy

CONNSTEP
a CBIA affiliate

ReadyCT

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Background

This program review report includes observations and key takeaways from data collected as part of the Manufacturing Skills for Connecticut (MSforCT) project and specific to the manufacturing program at Waterbury Career Academy. The report summarizes information gathered by WestEd between November 2020 and June 2021 through document reviews, surveys, and virtual site visits.

Manufacturing Skills for Connecticut Project Description [1]

Throughout Connecticut, significant gaps exist in the state's manufacturing workforce development system, most notably the dearth of comprehensive education, recruitment, and well-developed career pathways that, collectively, serve to connect industry to education. To address these issues CONNSTEP, in partnership with ReadyCT, the Connecticut Business & Industry Association (CBIA), and the Connecticut Manufacturers' Collaborative (CMC), designed the MSforCT project. The CMC includes all the major regional and statewide manufacturing member organizations across Connecticut, representing over 1200 manufacturing companies with tens of thousands of employees throughout all of Connecticut.

Funded through a grant from the U.S. Department of Commerce National Institute of Standards and Technology (NIST), the MSforCT project (2020-22) aimed to increase and improve career pathways to advanced manufacturing within the K-12 school system. To better understand which programs and models are most effective, remove the silos in which promising programs are operating, and share best practices, the project proposed to:

- complete a comprehensive inventory and analysis of manufacturing career pathway programs and initiatives across K-12 schools/districts;
- conduct program reviews of a subset of programs; and
- build a web-based repository of effective career pathway programs and key criteria for the creation of new programs. This interactive website will also serve as an online community of practice accessible to school districts, business associations, students and families, postsecondary institutions, and other stakeholders.

CONNSTEP contracted with WestEd, a nonprofit educational research, development, and service organization, to conduct the comprehensive inventory and program review. This report summarizes only a portion of the data collected during the overall project period. Specifically, this report focuses on the engineering and manufacturing programs at Waterbury Career Academy, one of the 13 programs that were selected for program reviews, and includes information collected via a state-wide online survey conducted in January 2021 and a virtual site visit conducted in June 2021.

[1] Project description adapted from ReadyCT's Manufacturing Skills for Connecticut webpage and *Manufacturing Skills for Connecticut Project Abstract*.

Waterbury Career Academy's Manufacturing Academy

Regional Information

Waterbury Career Academy is a public high school located in the North End section of Waterbury, CT. At the crossroads of Route 8 and I-84, Waterbury is the second-largest city in New Haven County, and in 2020 was named "the number one top affordable U.S. suburb with a city feel" by Zlllow[2] and Yelp. New Haven County is home to 1,413 manufacturing sector employers[3]. Once considered the brass capital of the world, leading to the city's nickname of Brass City, Waterbury was famous for the manufacturing of watches and clocks. As of June 2020, there were 144 manufacturing businesses in Waterbury, with 5,230 employees[4]. A new $48 million project – the Waterbury Industrial Commons – is home to four manufacturers, including Luvata (the world's largest manufacturer of semi-conductive wires for medical diagnostic systems) and King Industries (the world's leading technical specialists for high-performance industrial additives[5]. The Northwest Regional Workforce Investment Board (NRWIB) serves as the workforce investment board for the city of Waterbury and surrounding region. According to the most recent U.S. Census Bureau statistics, Waterbury has an estimated population of 107,568, a median household income of $42,401, with 23.4% of persons living in poverty[6].

District, School, and Program Overview

In the 2020-2021 academic year, there were 18,450 students in the Waterbury School District across 63 different schools within the district. According to 2019-20 Edsight[7] data, the district of Waterbury is 48% female and approximately 14% white. Of the students in the district, 15.5% identify as English learners (ELs), 80.8% qualify for free and reduced lunch, and 19.3% identify as students with special education needs. In the 2018-2019 academic year, 88% of graduates entered college in the fall immediately following high school graduation, with 17% attending 2-year colleges and 71% attending 4- year colleges. Waterbury is one of 33 Alliance Districts in CT; these are school districts with the lowest Accountability Index measures in the state[8].

Waterbury's Manufacturing Academy began in 2013. Waterbury has a partnership with Naugatuck Valley Community College which allows professors to come to campus and provide instruction on machinery. Additionally, Waterbury has an articulation agreement that allows students to receive college credit for courses taken during high school.

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[2] Zillow- What are the Top Affordable U.S. Suburbs with a City Feel?
[3] Connecticut Department of Labor- Labor Market Information
[4] The Waterbury- Why Waterbury?
[5] The Waterbury- Why Waterbury?
[6] U.S. Census- Waterbury city, Connecticut
[7] Edsight - Home
[8] CT.gov - Alliance Districts

Program Inventory Review

ReadyCT and WestEd worked together throughout fall 2020 to develop a comprehensive statewide inventory of K-12 Advanced Manufacturing Programs. To identify existing programs, WestEd used Google Forms and consulted with ReadyCT, the Connecticut State Department of Education (CSDE), and industry partners. At the end of the effort, the team had identified over 140 advanced manufacturing programs. A list of all programs identified can be found in Appendix A.

Survey and Site Selection Overview

WestEd researchers developed and disseminated an online survey to capture basic program data and inform the selection of programs to be reviewed.

Survey Development

The project team utilized several sources to develop a rubric to define high-quality, high-impact programs, including the Association for Career & Technical Education (ACTE)[9], the Society of Manufacturing Engineers (SME) and SME Education Foundation[10], the National Association of Manufacturers (NAM)[11], and the U.S. Department of Labor, Employment and Training Administration[12]. Survey questions were then developed to mirror the rubric and focused on five broad categories:

- Curriculum Standards and Competencies
- Business and Community Partnerships
- Career Development Offerings
- Sequencing and Articulation
- Access and Equity

Survey Dissemination

WestEd administered an online survey to K-12 manufacturing programs from February 3, 2021 through March 12, 2021. A total of 47 schools responded providing information on 51 programs, representing a 33% response rate. A list of all survey respondents can be found in Appendix B.

Site Selection

The project team used a combination of survey responses, site demographics, and industry recommendations to identify the manufacturing programs that would be invited to participate in a

[9] Association for Career & Technical Education (ACTE) - 12 Elements of a High-quality CTE Program of Study.
[10] Society of Manufacturing Engineers (SME) & SME Education Foundation - Four Pillars of Manufacturing Knowledge.
[11] National Association of Manufacturers (NAM) - NAM-endorsed Skills Certification System.
[12] U.S. Department of Labor, Employment and Training Administration - Advanced Manufacturing Competency Model.

program review of high-quality, high-impact manufacturing programs. Using the rubric created (see Appendix D) during the survey development phase, WestEd researchers scored and ranked each completed survey. A higher survey score indicated that, based on the rubric, the program was more closely aligned with elements of a high-quality, high-impact program. However, it is also important to note the limitations of this approach to identifying high-quality, high-impact programs. The primary limitations are that the programs were chosen among only a sample of manufacturing programs that completed the survey; not all surveys provided complete responses; and surveys were completed by respondents playing diverse roles with differing levels of programmatic knowledge. Thus, the sample from which the team identified high-quality, high-impact programs is limited by self-selection and the self-reported nature of the data source. It is possible that other manufacturing programs not responding to the survey are indeed high-quality and/or the programs chosen among the survey respondents provided incomplete or inaccurate information.

In addition to survey rankings, the research team considered ReadyCT's input as it further analyzed the program list. To ensure that the sample included variation, the project team considered region, urban-rural classification, and socioeconomic and diversity indexes to select a list of finalists that were eligible to participate in the program review. Finally, stakeholder feedback was incorporated into the project team's finalist list. The goal was to identify a group of sites that consisted of both programs of interest to the CMC and programs that were willing and able to participate in the evaluation. The final list of programs selected for review can be found in Appendix C.

Visit Overview

WestEd researchers conducted focus groups and interviews with stakeholders regarding the Engineering and Manufacturing Pathways at Waterbury Career Academy during the week of June 1, 2021. Due to the ongoing coronavirus pandemic and travel restrictions, the activities were held virtually using an online video conferencing system. The purpose of the focus groups and interviews was to gather information on program characteristics and activities to supplement data captured via the survey. Additionally, the focus groups and interviews provided an opportunity to gather information from key stakeholders about program strengths and challenges and solicited recommendations. The focus groups and interviews were tailored to stakeholders' roles as outlined below[13].

- An interview with the principal
- An interview with the assistant principal

[13] Please note that Waterbury suffered the loss of multiple program staff within the past year. Two faculty members passed away in the 2020-2021 academic year and two additional faculty members left the program due to health and retirement related issues.

- An interview with the career and technical Education (CTE) supervisor of the city of Waterbury
- Two interviews with business partners
- An interview with one teacher
- A focus group with three students

Program Review Results

The sections below synthesize information gathered through the program's documents, survey response, and virtual site visit. The results are organized by the framework that most influenced the site selection rubric—the 12 areas of high-quality CTE that were developed by the Association for Career & Technical Education (ACTE).

Summary by 12 Areas of High-Quality CTE

Standards-aligned and Integrated Curriculum

Waterbury's curriculum follows the State Department of Education's Career and Technical Education's standards. However, the curriculum has a heavy emphasis on machinery; providing instruction on operating milling machines and lathes. Additionally, Waterbury's curriculum leans heavily on theory and safety. The faculty interviewed stressed the balance between safety knowledge and content knowledge as a foundation for the program's curriculum.

The program's curriculum also includes employability skills training such as problem solving and workplace etiquette. Currently operating with only one instructor, the program is limited in its overall course offerings. Additionally, interview participants stated that strengthening the curriculum to ensure students graduate with certifications and increasing in-class learning time would result in overall improved program effectiveness.

Waterbury's program does not require an entrance exam nor prerequisite courses. There is also no minimum number of courses required to complete the program. Although students do not receive a certificate upon completion, the state of Connecticut recognizes Waterbury's program for providing hours towards a registered apprenticeship program.

Sequencing and Articulation

Waterbury's courses are designed to be taken in sequence. Sequential courses include: Exploratory Manufacturing, Manufacturing 1-4, Manufacturing NVCC, Lathe 1 & 2, and Milling 1 & 2.

Waterbury's Manufacturing Academy has a partnership with Naugatuck Valley Community College (NVCC). The college sends professors to Waterbury Career Academy to provide

instruction to students as they initiate their sequential courses. As a result of this partnership, students are able to enter college with up to 17 NVCC credits.

Student Assessment

Waterbury follows a traditional assessment format that includes primarily written tests and quizzes. Teachers use both formative and summative assessments that are created in-house. Along with written assessments, project-based assessments are also used to evaluate student content knowledge. Students are allowed to make up assessments in the case of illness or absence. However, assessments cannot be retaken to improve grades.

Waterbury's faculty asserted that National Institute for Metalworking Skills (NIMS)[14] certifications are available occasionally and are graded by local manufacturers. The school has also used content from Tooling U-SME[15] and Precision Exams. However, local employers have communicated that these certifications are inconsequential. Many employers prefer to train students in-house based on their needs.

Prepared and Effective Program Staff

There is currently only one skilled teacher in the manufacturing program. This faculty member holds an engineering degree and specializes in theory. He shared that he consistently engages in professional development to increase his knowledge of manufacturing by taking classes, attending workshops and engaging in self-taught learning. Waterbury offers district-wide professional development opportunities to their faculty which includes training in Tooling U, NIMS, and on machinery. As the school maintains a budget to support faculty professional development requests, instructors are encouraged to seek out their own professional development.

Due to the recent loss of program staff, several interview respondents stressed the need for increasing the program's staff by adding certified faculty. Students reflected on their learning experience in years past and described the faculty as encouraging and accommodating.

Engaging Instruction

Students have the opportunity to participate in project-based learning. Teachers use a project-oriented teaching strategy in which students are taught the theory behind hands-on learning before attempting the projects themselves. With an average class size of 15, students can receive the attention needed from their instructor to successfully approach assignments. Additionally, students are in the lab five days a week in order to become fully immersed in the field. Students reported being engaged in their career planning and developing their student success plans with their counselors.

[14] NIMS - Home
[15] Tooling U-SME - Home

Access and Equity

All Waterbury 9th graders complete an Exploratory in Manufacturing course for .25 credits. This includes students attending the manufacturing course daily for a marking period. At the end of their first year, students choose the academy they will join for the next three years.

Waterbury has several English Learners (ELs) within its manufacturing program, primarily Spanish speaking. The sole manufacturing teacher speaks some Spanish which helps to bridge gaps in communication. However, there are no dedicated supports within the classroom for ELs. The program does not have a large population of students with special educational needs.

Facilities, Equipment, Technology, and Materials

Waterbury's faculty feel as though they have developed a strong manufacturing facility. Students primarily work on micrometers, simulators, and Computer Numerical Control (CNC) machines. The program's equipment is relatively new and teachers have a budget for supplies. Students believe their access to the school's equipment sets them apart from high school students in other local manufacturing programs.

Business and Community Partnerships

Students have many opportunities to interact with business partners. Students take field trips to local manufacturing businesses and speak one-on-one with employers about future opportunities, including pre-apprenticeship programs, what it's like to work in the business, and employment benefits and retirement. Local businesses also visit the school to talk with students about opportunities in the field of manufacturing.

Local business partners expressed a desire to educate students and families on what manufacturing is and what a career in manufacturing could look like. There is a push from local manufacturing companies to employ students after high school graduation, however this has not been an easy feat. There have been instances where partners tried to recruit students for post-graduate employment, but their parents wanted them to attend a postsecondary institution. Even with the offer of having night classes paid for, many students decide to attend college rather than directly entering the workforce.

Student Career Development

Waterbury students have many opportunities to participate in career development activities. In addition to attending career fairs on campus, Waterbury's business partners also visit classes and give presentations on the specifics of their businesses. Once a student turns 16, they are eligible to participate in work-based learning manufacturing opportunities through the program[16].

[16] Connecticut Department of Labor – Employment of Minors

Waterbury offers a wealth of career development opportunities. For example, program staff identified career education and awareness, career exploration, career immersion, professional mentoring, and additional resources and supports to help students find work.

Career and Technical Student Organizations

Waterbury is in the process of bringing Skills USA to their campus. However, at the time of the site visit no Career and Technical Student Organizations (CTSOs) existed at the school.

Work-based Learning

Waterbury offers students job shadowing, pre-apprenticeships, paid summer internships and on the job training through its local business partnerships. Additionally, many students transition to paid positions upon graduation. The program director serves as the liaison between the students and business partners and is integral in the process of securing career development opportunities for students. Waterbury's manufacturing partners spoke highly of the school's students. One partner in particular stated that Waterbury's students were, "an HR directors dream".

The COVID-19 pandemic derailed a number of career development opportunities. Despite these challenges however, two of the three students interviewed planned to participate in paid internships in the summer 2021. On average, five to six students are placed in internships or pre-apprenticeships annually. Currently, in the 2021-22 school year, there are four students placed in manufacturing facilities.

Data and Program Improvement

Waterbury collects a number of student data points. The number of ninth graders in the manufacturing program pathway is measured annually as well as how many students enroll in manufacturing courses. The school also measures the number of students who enroll in two-year and four-year colleges, the number of students entering the field after graduation, and the number of students placed in pre-apprenticeship programs.

Final Reflections and Takeaways

The program finds strength in its community partnerships and funding. The relationship between the school and local businesses is a key attribute of the program. This partnership is supported in large part by Waterbury's Vice Principal/Program Director who is in constant communication with business partners. Partners stressed that the director goes above and beyond to incorporate their feedback and ensure that students are supported and prepared. Waterbury's most pressing challenge is securing certified, prepared faculty.

Appendix A: Inventory of CT K-12 Advanced Manufacturing Programs, by District

Ansonia School District

Ansonia High School, Ansonia, CT

Berlin School District

Berlin High School, Berlin, CT

Bolton School District

Bolton High School, Bolton, CT

Bridgeport School District

Bassick High School, Bridgeport, CT
Bridgeport Regional Vocational Aquaculture School, Bridgeport, CT
Central High School, Bridgeport, CT
Fairchild Wheeler Interdistrict Multi-Magnet High School, Bridgeport, CT
Kolbe Cathedral High School, Bridgeport, CT
Warren Harding High School, Bridgeport, CT

Bristol School District

Bristol Central High School, Bristol, CT
Bristol Eastern High School, Bristol, CT

Brookfield School District

Brookfield High School, Brookfield, CT

Capitol Region Education Council

Academy of Aerospace and Engineering, Windsor, CT

Cheshire School District

Cheshire High School, Cheshire, CT

Clinton School District

The Morgan School, Clinton, CT

Colchester School District

Bacon Academy, Colchester, CT

Connecticut Technical Education and Career System (CTECS)

A. I. Prince Technical High School, Hartford, CT
Bristol Technical Education Center, Bristol, CT
Bullard-Havens Technical High School, Bridgeport, CT
E. C. Goodwin Technical High School, New Britain, CT
Eli Whitney Technical High School, Hamden, CT
Ella T. Grasso/Southeastern Technical High, Groton, CT
Emmett O'Brien Technical High School, Ansonia, CT
H. C. Wilcox Technical High School, Meriden, CT
Harvard H. Ellis Technical High School, Danielson, CT
Henry Abbott Technical High School, Danbury, CT
Howell Cheney Technical High School, Manchester, CT
J.M. Wright Technical High School, Stamford, CT

Norwich Technical High School, Norwich, CT
Oliver Wolcott Technical High School, Torrington, CT
Platt Technical High School, Milford, CT
Vinal Technical High School, Middletown, CT
W. F. Kaynor Technical High School, Waterbury, CT
Windham Technical High School, Windham, CT

Coventry School District

Coventry High School, Coventry, CT

Cromwell School District

Cromwell High School, Cromwell, CT

Danbury School District

Danbury High School, Danbury, CT

Darien School District

Darien High School, Darien, CT

Derby School District

Derby High School, Derby, CT

East Granby School District

East Granby High School, East Granby, CT

East Haddam School District

Nathan Hale-Ray High School, Moodus, CT

East Hartford School District

East Hartford High School, East Hartford, CT
Synergy Alternative High School, East Hartford, CT
Woodland School, East Hartford, CT

East Haven School District

East Haven High School, East Haven, CT

East Lyme School District

East Lyme High School, East Lyme, CT

Eastern Connecticut Regional Educational Service Center (EASTCONN)

Quinebaug Middle College, Danielson, CT

Ellington School District

Ellington High School, Ellington, CT

Enfield School District

Enfield High School, Enfield, CT

Fairfield School District

Fairfield Ludlowe High School, Fairfield, CT
Fairfield Warde High School, Fairfield, CT

Farmington School District

Farmington High School, Farmington, CT

Glastonbury School District

Glastonbury High School, Glastonbury, CT

Granby School District

Granby Memorial High School, Granby, CT

Greenwich School District

Greenwich High School, Greenwich, CT

Griswold School District

Griswold High School, Griswold, CT

Groton School District

Robert E. Fitch High School, Groton, CT

Guilford School District

Guilford High School, Guilford, CT

Hamden School District

Hamden High School, Hamden, CT

Hartford School District

Hartford Public High School, Engineering & Green Technology Pathway, Hartford, CT

Pathways Academy of Technology & Design, East Hartford, CT

Killingly School District

Killingly High School, Killingly, CT

LEARN

Connecticut River Academy, East Hartford, CT

Lebanon School District

Lyman Memorial High School, Lebanon, CT

Ledyard School District

Ledyard High School, Ledyard, CT

Madison School District

Daniel Hand High School, Madison, CT

Manchester School District

Manchester High School, Manchester, CT

Meriden School District

Francis T. Maloney High School, Meriden, CT

Orville H. Platt High School, Meriden, CT

Middletown School District

Middletown High School, Middletown, CT

Milford School District

Joseph A. Foran High School, Milford, CT

The Academy, Milford, CT

Milford School District

Jonathan Law High School, Milford, CT

Monroe School District

Masuk High School, Monroe, CT

Montville School District

Montville High School, Oakdale, CT

New Britain School District

New Britain High School, New Britain, CT

New Canaan School District

New Canaan High School, New Canaan, CT

New Haven School District

Metropolitan Business Academy, New Haven, CT
Riverside Education Academy, New Haven, CT

New Haven School District

Engineering - Science University Magnet School, West Haven, CT
Wilbur Cross High School, New Haven, CT

New London School District

New London High School, New London, CT

Newtown School District

Newtown High School, Sandy Hook, CT

North Stonington School District

Wheeler High School, North Stonington, CT

Norwich Free Academy

Norwich Free Academy, Norwich, CT

Old Saybrook School District

Old Saybrook High School, Old Saybrook, CT

Plainfield School District

Plainfield High School, Plainfield, CT

Plainville School District

Plainville High School, Plainville, CT

Plymouth School District

Terryville High School, Terryville, CT

Portland School District

Portland High School, Portland, CT

Regional School District 1

Housatonic Valley Regional High School, Falls Village, CT

Regional School District 4

Valley Regional High School, Deep River, CT

Regional School District 5

Amity Regional High School, Woodbridge, CT

Regional School District 7

Northwestern Regional High School, Winsted, CT

Regional School District 8

RHAM High School, Hebron, CT

Regional School District 10

Lewis S. Mills High School, Burlington, CT

Regional School District 12

Shepaug Valley School, Washington, CT

Regional School District 15

Pomperaug High School, Southbury, CT

Regional School District 16

Woodland Regional High School, Beacon Falls, CT

Regional School District 17

Haddam-Killingworth High School, Higganum, CT

Regional School District 18

Lyme-Old Lyme High School, Old Lyme, CT

Regional School District 19

E. O. Smith High School, Storrs, CT

Rocky Hill School District

Rocky Hill High School, Rocky Hill, CT

Seymour School District

Seymour High School, Seymour, CT

Shelton School District

Shelton High School, Shelton, CT

Simsbury School District

Simsbury High School, Simsbury, CT

Somers School District

Somers High School, Somers, CT

South Windsor School District

South Windsor High School, South Windsor, CT

Southington School District

Southington High School, Southington, CT

Stafford School District

Stafford High School, Stafford Springs, CT

Stamford School District

The Academy of Information Technology, Stamford, CT

Stonington School District

Stonington High School, Stonington, CT

Stratford School District

Frank Scott Bunnel High School, Stratford, CT

Stratford School District

Stratford High School, Stratford, CT

Suffield School District

Suffield High School, Suffield, CT

Thomaston School District

Thomaston High School, Thomaston, CT

Thompson School District

Tourtellotte Memorial High School, North Grosvenordale, CT

Torrington School District

Torrington High School, Torrington, CT

Trumbull School District

Trumbull High School, Trumbull, CT

Unified School District #1

State of Connecticut Department of Correction, Wethersfield, CT

Vernon School District

Rockville High School, Vernon, CT

Wallingford School District

Lyman Hall High School, Wallingford, CT

Mark T. Sheehan High School, Wallingford, CT

Waterbury School District

Waterbury Career Academy, Waterbury, CT

Waterbury School District

Crosby High School, Waterbury, CT

John F. Kennedy High School, Waterbury, CT

Wilby High School, Waterbury, CT

Waterford School District

Waterford High School, Waterford, CT

Watertown School District

Watertown High School, Watertown, CT

West Hartford Public Schools

Conard High School, West Hartford, CT

William H. Hall High School, West Hartford, CT

West Haven School District

West Haven High School, West Haven, CT

Westbrook School District

Westbrook High School, Westbrook, CT

Wethersfield School District

Wethersfield High School, Wethersfield, CT

Windham School District

Windham High School, Windham, CT

Windsor School District

Windsor High School, Windsor, CT

Windsor Locks School District

Windsor Locks High School, Windsor Locks, CT

Wolcott School District

Wolcott High School, Wolcott, CT

Woodstock Academy

The Woodstock Academy, Woodstock, CT

Appendix B: CT Advanced Manufacturing Program Survey Respondents, by District

Ansonia School District
- Ansonia High School, Ansonia, CT

Bridgeport School District
- Bassick High School, Bridgeport, CT

Bristol School District
- Bristol Central High School, Bristol, CT
- Bristol Eastern High School, Bristol, CT

Cheshire School District
- Cheshire High School, Cheshire, CT

Colchester School District
- Bacon Academy, Colchester, CT

Connecticut Technical Education and Career System (CTECS)
- Bristol Technical Education Center, Bristol, CT
- Bullard-Havens Technical High School, Bridgeport, CT
- Eli Whitney Technical High School, Hamden, CT
- H. C. Wilcox Technical High School, Meriden, CT
- Harvard H. Ellis Technical High School, Danielson, CT
- Platt Technical High School, Milford, CT
- Vinal Technical High School, Middletown, CT
- W. F. Kaynor Technical High School, Waterbury, CT

Coventry School District
- Coventry High School, Coventry, CT

East Granby School District
- East Granby High School, East Granby, CT

East Haddam School District
- Nathan Hale-Ray High School, Moodus, CT

East Hartford School District
- East Hartford High School, East Hartford, CT

East Haven School District
- East Haven High School, East Haven, CT

Eastern Connecticut Regional Educational Service Center (EASTCONN)
- Quinebaug Middle College, Danielson, CT

Glastonbury School District
- Glastonbury High School, Glastonbury, CT

Griswold School District
- Griswold High School, Griswold, CT

Hamden School District
- Hamden High School, Hamden, CT

Hartford School District

HPHS Academy of Engineering & Green Technology, Hartford, CT

LEARN

Connecticut River Academy, East Hartford, CT

Lebanon School District

Lyman Memorial High School, Lebanon, CT

Madison School District

Daniel Hand High School, Madison, CT

Manchester School District

Manchester High School, Manchester, CT

New Britain School District

New Britain High School, New Britain, CT

Plainfield School District

Plainfield High School, Plainfield, CT

Plainville School District

Plainville High School, Plainville, CT

Regional School District 16

Woodland Regional High School, Beacon Falls, CT

Regional School District 8

RHAM High School, Hebron, CT

Rocky Hill School District

Rocky Hill High School, Rocky Hill, CT

South Windsor School District

South Windsor High School, South Windsor, CT

Stonington School District

Stonington High School, Stonington, CT

Suffield School District

Suffield High School, Suffield, CT

Thomaston School District

Thomaston High School, Thomaston, CT

Thompson School District

Tourtellotte Memorial High School, North Grosvenordale, CT

Torrington School District

Torrington High School, Torrington, CT

Unified School District #1

State of Connecticut Department of Correction, Wethersfield, CT

Wallingford School District

Lyman Hall High School, Wallingford, CT

Waterbury School District

Waterbury Career Academy, Waterbury, CT

West Hartford Public Schools

Conard High School, West Hartford, CT

William H. Hall High School, West Hartford, CT

Windham School District

Windham High School, Windham, CT

Windsor School District

Windsor High School, Windsor, CT

Appendix C: Final List of CT Programs Selected for Review

Bacon Academy Manufacturing at Bacon Academy Colchester School District, Colchester, CT
Bristol Manufacturing Production Pathway at Bristol Central & Bristol Eastern High Schools Bristol School District, Bristol, CT
Early College Advanced Manufacturing Program at Connecticut River Academy LEARN Regional Education Service Center, East Hartford, CT
Precision Machining Technology at Eli Whitney Technical High School Connecticut Technical Education and Career System (CTECS), Hamden, CT
Hamden Engineering Careers Academy at Hamden High School Hamden School District, Hamden, CT
Intro to Manufacturing at Lyman Hall High School Wallingford School District, Wallingford, CT
Manchester Public Schools Manufacturing Program at Manchester High School Manchester School District, Manchester, CT
Academy of Manufacturing, Engineering & Technology (MET) at New Britain High School New Britain School District, New Britain, CT
Manufacturing for Industry: YMPI with EWIB at RHAM High School Regional School District 8, Hebron, CT
Manufacturing Pathway at Tourtellotte Memorial High School Thompson School District, North Grosvenordale, CT
Precision Machining Technology at Vinal Technical High School Connecticut Technical Education and Career System (CTECS), Middletown, CT
Manufacturing Academy at Waterbury Career Academy Waterbury School District, Waterbury, CT
Career and Technical Education at Windsor High School[17] Windsor School District, Windsor, CT

[17] Windsor High School declined to participate in the program review.

Appendix D: Scoring Rubric

Category Name	Full Question	Response Required to Receive Point	Related High-quality CTE Program Element	Element-Weighted Score	Non-Weighted Score
Identified Student Populations	Has your program identified student populations in your vicinity that are typically underserved educationally or underemployed due to educational, economic or other barriers?	Yes	Access and Equity	0.3333333333	1
Identified Root Causes	Has your program identified the root causes of identified gaps in participation and performance of these student groups?	Yes	Access and Equity	0.3333333333	1
Orgs to Support Access & Equity	Has your program utilized any organizations and/or resources to support your efforts related to access and equity?	Yes	Access and Equity	0.3333333333	1
Business Partnerships	Is your program involved in any business partnerships?	Yes	Business and Community Partnerships	0.5	1
Community Partnerships	Is your program involved in any community partnerships (i.e., partnerships with nonprofit organizations, public agencies, and/or government offices)?	Yes	Business and Community Partnerships	0.5	1

Category Name	Full Question	Response Required to Receive Point	Related High-quality CTE Program Element	Element-Weighted Score	Non-Weighted Score
CTSOs	Has your school established one or more Career and Technical Student Organizations (CTSOs)?	Yes	Career and Technical Student Organizations (CTSOs)	1	1
Age: > 5 Years	Calculated age using starting year provided	> 5 Years	Data and Program Improvement	0.5	1
Program Data	Please describe the types of data the program collects and how data are used.	Response Provided	Data and Program Improvement	0.5	1
Specialized Facilities	Please describe any specialized facilities, equipment, technology, and/or materials available to program participants. Please provide any relevant website links or documentation.	Response Provided	Facilities, Equipment, Technology and Materials	1	1
Staff PD	Do program staff have opportunities to participate in professional learning activities specific to advanced manufacturing?	Yes	Prepared and Effective Program Staff	1	1
Sequenced Courses	Does the program structure require students to take courses in a SEQUENCE (e.g., Advanced Manufacturing Technology I, Advanced Manufacturing Technology II, Advanced Manufacturing Technology III, etc.)?	Yes	Sequencing and Articulation	0.3333333333	1

Category Name	Full Question	Response Required to Receive Point	Related High-quality CTE Program Element	Element-Weighted Score	Non-Weighted Score
Credentials	Which of the following industry-recognized credentials does your program offer?	At least 1 selected	Sequencing and Articulation	0.3333333333	1
Credit that Articulates	Which of the following opportunities to earn credit that articulates to the next level of education does your program offer?	At least 1 selected	Sequencing and Articulation	0.3333333333	1
Industry-Recognized Standards & Competencies	Does your program's curriculum incorporate industry-recognized technical standards and competencies (e.g., NIMS, AWS, MSSC, etc.)?	Yes	Standards-aligned and Integrated Curriculum	0.25	1
Employability Skill Standards	Does your program's curriculum incorporate employability skill standards, such as problem solving, critical thinking, teamwork, communications, interview skills, and workplace etiquette, that help students succeed in the workplace?	Yes	Standards-aligned and Integrated Curriculum	0.25	1
Publicly Available Standards	Are program standards publicly available and accessible?	Yes	Standards-aligned and Integrated Curriculum	0.25	1
Curriculum Reviewed Regularly	Is the program's curriculum reviewed regularly?	Yes	Standards-aligned and Integrated Curriculum	0.25	1

Category Name	Full Question	Response Required to Receive Point	Related High-quality CTE Program Element	Element-Weighted Score	Non-Weighted Score
Career Development	Which of the following career development opportunities does your program offer?	At least 1 selected	Student Career Development	1	1
Work-based Learning	Which of the following work-based learning opportunities does your program offer?	At least 1 selected	Work-based Learning	1	1
			Total Possible Score:	**10**	**19**